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A DAY'S COLLECTING!

Looking through reports of people collecting any form of wildlife, be it leopards or slugs, the uninitiated observer would presume that on every trip success was met with on all occasions. It is only when actually taking part in one of these collecting trips that some of the pitfalls come to light. A recent collecting excursion into the lowlands of Scotland produced a classic example of the type of results that can be produced when luck, conditions and the will of Allah combine against you.

The day started out fine with the recording of reasonable numbers of snails from some very interesting sites bordering the road from Moffat to the waterfall known as 'The Grey Mares Tail'. However, one of the special sites we wanted to visit was the small lake known as Loch Skene above the falls. Loch Skene being famous amongst masochistic conchologists for its specialised snail inhabitant. Puffed up with the success of our perambulations earlier in the day we donned our protective clothing, loaded ourselves up with collecting gear and set off up the path to the top of the falls. Very soon, however, we were more puffed out than up, as is typical of people with too much enthusiasm we took the harder and steeper path which turned out to be almost vertical up past the falls. One hour later we did, however, stagger to a halt on the banks of the Loch. It was at this point that we realized that our packed lunch was back down at the foot of the falls. After getting over this disaster and re-gathering our self control the hunt commenced.

I little need to tell the reader by now that our luck was still out. Over an hour later cold, wet and a little disgruntled we re-grouped to check our tally, total find; two rather small and sad looking Pisidiums. Three hours after the start of our expedition we arrived back at our conveyance, our total bag 'Nil', but what about those Pisidiums? Well, if any reader happens to be on the banks of Loch Skene sometime in the near future we would be grateful if they could send them on. That's right, we left them sitting smugly in a tube on the boulder we used as our base.

The rest of the day fared little better, ending in what can only be described as a disaster. The methods used for recording give an average number of species which can be expected for any given area. The average in lowland Scotland soon proved to be in the region of 20 species. The last area designated to us for the day, however, produced a number slightly smaller than this.

We entered the area via the A701 coming from the North towards Moffat and traversed it from Fingland to Auldhoushill Bridge, never heard of them you say, well that is hardly surprising as nobody seems to live there. Picture an area like a huge dish of brown porridge which has solidified in parts to form islands on which a few grasses and other plants seemed to be hanging on, perhaps for fear of falling into the morass, got the picture? Well, now add a cold wind and driving rain and you will know what we were up against. The whole place was like a conchologist's nightmare. Cold, soaked and miserable for the second time that day we searched in desperation but with no luck whatsoever, until we came to a layby in which stood an A.A. emergency telephone box. The A.A. turned up trumps with a single snail Oxychilus alliarius at the foot of the box, ten minutes later, after a lot of searching, a single slug turned up which subsequently turned out to be Agriolimax agrestis, a common and widespread species in the area.

Back at our hotel that night we had the dubious pleasure of reporting the worst day's collecting any of us had had in many years. Well, as they say, not all is lost, the slug is now stored in the collections of the Leeds City Museums taking its humble place amongst such celebrated slugs as Boettgerilla pallens, a recent Russian invader of our coasts.

The Two Adrians (Norris and Rundle)

PARADISE LOST?

The Snail alone of Mollusca appears in the Bible, twice:

- (1) These also shall be unclean unto you among the creeping things that creep upon the earth; the weasel, and the mouse, and the tortoise after its kind,
And the ferret, and the chameleon, and the lizard, and the snail, and the mole.

Leviticus 11: 29 & 30 (Authorised Version)

- (2) As a snail which melteth, let every one of them pass away; like the untimely birth of a woman, that they may not see the sun.

Psalms 58:8 (A.V.)

Other renderings are: 'Let them consume away like a snail (Book of Common Prayer); Let them be as a snail which melteth and passeth away (Revised Version); Let them be like the snail which dissolves into slime (Revised Standard Version); May they melt like a snail as it moves (James Moffat's Translation); As the snail that passeth in slime (W.O.E. Oesterley's Translation).

The Hebrew word translated 'snail' in Leviticus is homet or chomet. This is rendered 'sand lizard' (=skink) in Hastings's Dictionary of the Bible, 2nd edition. As its presence in the Pentateuch is solely supported by King James's Bible, the snail must reluctantly be eliminated therefrom.

The word translated 'snail' in Psalm 58 is shablul or shabbelul, which according to R. Young's Analytical Concordance, 8th edition, also means a 'festering sore'. Oesterley writes: "The snail is particularly interesting. The slimy trail the creature leaves is supposed to be a part of its body, which thus gradually wears away....The person weaving the spell was making a deliberate attempt to destroy his enemy thereby....When he classified them with the snail, the effect would be that every movement of theirs would scrape from them a portion of their substance, and so would, in the end, wear them completely away."

M.F. Unger, in his Bible Dictionary, explains that "The surface of rocks, walls and tree trunks in this land is often covered with a thin pellicle, looking like a film of collodion or gelatine. This is caused by the passing and repassing of snails, which always leave a slimy track behind them. This is the melting of the snail, alluded to in the above passage. If a snail remains attached to a place in the hot sun it will dry up and be stuck fast to its resting place by this inspissated mucilaginous fluid" (=slime).

In James Ridgway's Helps to the Study of the Bible, 4th edition, we read that "Shablul is evidently a snail that wastes away; the allusion being to the popular error that the slime emitted in its track gradually consumed it, or to the fact of its dying under the influence of salt, or appearing to dry up when subjected to a dry hot atmosphere, which makes it a fit illustration of the wicked blighted by God's curse."

After these erudite exegeses, one reads with dismay that G.R. Diver has shown that shabbelul actually means a miscarriage (Journal of Theological Studies 34: 41 seq.). Must the Snail then be ousted from Holy Writ and lose altogether its precarious foothold in Paradise?

Note: translations of the Bible earlier than the Authorised Version have not been consulted.

A. E. Ellis

SOME OBSERVATIONS AND NOTES ON HELIX (H.) POMATIA L.,

BRITAIN'S LARGEST LAND SNAIL

I first became acquainted with this very interesting snail when I visited Titsey Hill on the North Downs overlooking the town of Limpsfield in Surrey. The main purpose of the visit was to look at the view and go on a local walk, but our attention was diverted to the masses of large apple-sized snails which were crossing the path. As I had heard something about these snails before, I was not so surprised as my brother and father, who stood gaping in awe at these large snails, which were in fact very fine specimens of H. pomatia.

I collected the best specimens I could see and put them into a plastic collecting bag to take home. When I arrived home and showed the animals to my mother she stared at them for a while and said 'Get those things out of here.' I decided that I would try to keep them alive outside if I could not have them indoors, so I made a vivarium. I have observed their habits for about 3 years on and off. Some of these I relate here.

Helix pomatia has several English names, the commonest is the name 'Roman Snail'. This refers to the legend that they were introduced by the Romans who were, by the way, very partial to this snail. Other names are 'Edible Snail' (I think this is the most suitable as it is fattened and eaten in quite a few European countries), 'Vine Snail' and 'Apple Snail'. This snail has been introduced into many scattered localities in South-East England. It is an obligatory calcicole, so that it only occurs in calcareous places, in chalk quarries, open woodland and grassy places. It prefers undisturbed localities and uncultivated land so it is in all probability becoming scarcer.

H. pomatia is distributed in central Europe, from South-East Russia down to eastern France. It has been introduced into this country, and more recently, into North Africa, Argentina, Uruguay, and into the U.S.A. at Jackson, and Michigan where it is damaging gardens, contrary to what A.E. Boycott (1936) says that 'It occurs in gardens, where it is harmless.' Perhaps it is the warmer climate that provokes the snail to change its habits so notably.

I will not go into a detailed description of the animal and shell of H. pomatia, because most of you will be familiar with this species. The shell is large (height and breadth 38-45mm. approx.) and solid. It has a gradually elevated, blunt spire and the bodywhorl takes up about four-fifths of the shell. The umbilicus is reduced to a thin cleft because of the reflected columellar lip (though sometimes - especially in young specimens - not so much). The colour of the shell varies from cream to pale yellow brown, and has up to five fuzzy darker brown bands usually in the configuration 0(23)45. The animal is very large and is pale mustard coloured with a broad foot.

H. pomatia are hermaphrodite and usually mate at regular intervals during early Summer up to early Autumn. I once watched a pair in late September. The Autumn was a particularly warm one (1971). Both partners raise their soles off the ground and bring them together (once someone remarked, 'Like two suction cups') caressing each other all the time with their tentacles. After a time the pair project a calcareous love dart into the sole of each other and the act of mating proceeds. Some people, when they collect this snail, dissect out the love dart and present it together with the shell in their collection.

After about 5 to 6 weeks, as I observed, the eggs are fertilized and are ready to be laid. The animal then proceeds to dig a vertical shaft with a round hollow at the bottom in which to lay its eggs. The snail is then ready to lay its 30 to 50 or so pearl white eggs which it is carrying. This is a long process as there are so many eggs and it will probably take one good afternoon to complete. The egg laying and 'nest' digging can be observed if the snail is induced to make its chamber next to the glass wall of the vivarium, although the glass section through which the eggs can be seen must be covered up afterwards to stop the eggs being exposed to the sun on the side next to the glass.

If the animal is disturbed after it has dug the chamber but before it has laid the eggs, it can be taken out and placed on the surface of the soil in the vivarium. I have found that in this way the animal will be induced to lay the eggs on the surface, and one can take the eggs and observe them at different stages of their development. To do this, take a small cardboard box with a lid that takes off easily (e.g. a small shoebox) and pierce holes in the side, top and bottom. Next, line the box with some soft absorbent material and dampen it with a little water. Now you can place the eggs on to the absorbent material very carefully and close the lid, placing the box in a cool, but not too cool, place away from the sun. Keep the box in the same position and keep the absorbent material damp. You should be able to observe the gradual darkening of the eggs to a light brown and gradually to a dark brown before the young snails hatch out.

Roman snails hibernate for about half the year in this country (in warmer countries less so), usually from October till April. As Winter approaches it burrows under the dead leaves, etc. and sometimes into the underlying soil. It proceeds to turn the aperture of its shell upwards and then closes it with a thick porous epiphragm which is composed of hardened mucus-secretion and lime. Within this it secretes another epiphragm made of hardened mucus-secretion only. This acts like 'double-glazing' during the Winter months. This epiphragm, being porous, does not normally have a breathing pore, as in snails with non-porous epiphragms. In the Spring these are discarded and new ones made the next year.

The Winter is about the worst time for young H. pomatia who, with very thin shells, always have to burrow right down into the leaves to obtain enough warmth. Of my newly hatched young I only usually achieve a 50% survival. When the snail does reach its full age (about 3 or 4 years old) it has a much better chance of survival than when it was young. One of the enemies it has now to contend with are parasites. One of the more interesting of these is the glow-worm which frequents chalky places. It injects a fluid into the snail which first paralyzes it and makes it dissolve. Whereupon it simply sucks up the remains!

So there we are. I hope that this essay has introduced some people to this snail for the first time, and enhanced the knowledge of those who are already familiar with this species. But this is by no means a complete history of this snail. That I have left to the experts.

Peter Topley

A VERTIGO LILLJEBORGI SITE IN WIGTOWNSHIRE

On 20 September 1973, when working as one of two teams engaged on non-marine mollusc distribution mapping in southern Scotland, A. Norris and I visited a small marshy area on the north shore of Loch Heron, Balminnoch, Wigtownshire (Grid Ref. 25/272652). The marsh was between a farm on the opposite side of a road and the loch, and dominated by Juncus and Meadowsweet (Filipendula ulmaria (L.) Maximowicz); it appeared to be ungrazed, possibly because a small pumping station stood in it.

During the field work V. lilljeborgi was found living amongst wet decaying vegetation along the water's edge (under overhanging clumps of Juncus), and V. antivertigo was found living about a yard away from this edge among flattened vegetation (D.C.L.), and under planks and on grass further round the shore of the lake (A.N.).

Both of us collected samples of the vegetation at the edge of the loch; one collected by A.N. - plants growing out of about 2" of water between a small Juncus tussock and the main bank - contained about 17 adult and juvenile V. lilljeborgi, while a second sample collected by A.N. in about 1" of water and some six inches away from the first was examined by Dr. A.J. Rundle and contained no Vertigo. The sample I collected from the loch edge about three yards from the first two contained both V. lilljeborgi and V. antivertigo living.

This sample consisted of two separate but contiguous clumps of the rush Juncus acutiflorus Hoffmann with intertwined Galium palustre (L.), a stem only of a grass ? Glyceria sp., the basal soil with an unidentified moss, and decaying vegetation including leaves of F. ulmaria, Salix sp. and Phragmites fragments. It contained the following molluscs:

<u>Carychium minimum</u> seg	6
<u>Lymnaea palustris</u>	2 dead shells
" (probable <u>palustris</u> juvenile)	17
<u>Planorbis contortus</u>	87 (at base)
<u>Vertigo antivertigo</u>	11
" <u>lilljeborgi</u>	19
<u>Euconulus fulvus</u>	4 (possibly <u>alderi</u> ; Dr. C.R.C. Paul in lit. 23 November 1973)
<u>Zonitoides nitidus</u>	3 dead shells (living in the marsh)
<u>Agriolimax laevis</u>	3
<u>Pisidium obtusale</u>	177 in basal soil and moss

Although it is impossible to eliminate the effects of post-collection disturbance from this sample, there was slight evidence from a first examination that V. antivertigo occurred at a slightly higher level than V. lilljeborgi (perhaps 5-10cm. above), and it cannot be definitely stated that the micro-habitats of these Vertigos had here merged.

However, it appears from the Loch Heron site and the discovery of V. lilljeborgi and V. antivertigo within a few inches of each other at Friars Crag near Keswick, Cumberland, by A. Norris on 26 August 1971 (A.N. in lit. 23 November 1973), that the two species can occur living closer together than Kevan and Waterston (1933), and Dance (1972) suggest. This may be particularly the case in localities where marsh surfaces are irregular and the liability to flooding changes over very small areas. Readers may like to bear in mind the possibility of actually finding the two species in association at such a site.

D. C. Long

Acknowledgements

I would like to thank Mr. A. Norris for reading this note in draft and for supplying some details, Dr. M. P. Kerney for identifying Pisidium obtusale, Dr. C. R. C. Paul for examining the Euconulus, and Mrs. S. C. Holland of the BSBI Council for confirming the identity of J. acutiflorus.

References

- Kevan, D.K., and Waterston, A.R., 1933. Vertigo lilljeborgi (West.) in GREAT BRITAIN (with additional IRISH localities). J. Conch. 19:296-313
- Dance, S.P., 1972. Vertigo lilljeborgi Westerlund in North Wales. J. Conch. 27:387-390

MOLLUSCS, GEOLOGY AND POLLUTION

For the purpose of this study the coast between Pagham near Selsey and Eastbourne, Sussex, was divided into seven sections between major seaside towns. The greater part of each section was walked over, at low tide, during the summer and autumn of 1973, and all the molluscs seen are recorded in the species and distribution table overleaf. This is marked in accordance with the conventions of the marine census as follows:-

A = live, B = dead animal or empty shell, C = worn or broken shell.

The 64 species recorded is far in excess of the expected total, demonstrating that this coast is not so barren of molluscs as it is generally thought to be. The most widely distributed molluscs along this coast are Mytilus edulis, Ostrea edulis, Venerupis pullastra, Littorina littorea, Crepidula fornicata, Nucella lapillus and Sepia officinalis. Mytilus, Littorina, and Nucella, being littoral species, are usually found alive in suitable habitats. The rest,

In the species list P-B = Pagham to Bognor; B-L = Bognor to Littlehampton; L-W = Littlehampton to Worthing; W-B = Worthing to Brighton; B-N = Brighton to Newhaven; N-BH = Newhaven to Beachy Head; BH-E = Beachy Head to Eastbourne.

CHITONIDA	P-B	B-L	L-W	W-B	B-N	N-BH	BH-E
<u>Lepidochitona cinereus</u>					A		A
GASTROPODA							
<u>Patella vulgata</u>	A	A			A	A	A
<u>Acmea virginea</u>						C	
<u>Calliostoma zizyphinum</u>						B	C
<u>Gibbula cineraria</u>	B	B	B		A	A	A
<u>Lacuna pallidula</u>						A	
<u>Littorina littorea</u>	A	A	A		A	A	A
<u>Littorina obtusata</u>	A				A		A
<u>Littorivaga tenebrosa</u>	A	A	A		A	A	A
<u>Melaraphe neritoides</u>	A				A	A	A
<u>Onoba semicostata</u>						B	C
<u>Cingula semistriata</u>						B	
<u>Galeodina carinata</u>						B	
<u>Rissoa parva</u>						A	C
<u>Tornus subcarinatus</u>						C	C
<u>Bittium reticulatum</u>						C	
<u>Clathrus clathrus</u>						C	
<u>Cerithiopsis tubercularis</u>						B	
<u>Crepidula fornicata</u>	A	B	B	B	A	B	A
<u>Trivia arctica</u>						C	C
<u>Nucella lapillus</u>	A	A	A		A	A	A
<u>Ocenebra erinacea</u>		C				C	C
<u>Buccinum undatum</u>	C	B				C	C
<u>Hinia reticulata</u>	C	B			C	C	C
<u>H. incrassata</u>						C	B
<u>Philbertia linearis</u>						B	
<u>Philine punctata</u>						B	
<u>Chrysallida spiralis</u>						C	C
<u>Chrysallida interstincta</u>						C	C
<u>Odostomia unidentata</u>						B	
<u>O. scalaris</u>						C	C
<u>O. turrita</u>						C	C
<u>Eulimella laevis</u>						B	
BIVALVIA							
<u>Nucula nucleus</u>						C	
<u>N. turgida</u>							B
<u>Mytilus edulis</u>	A	A	A	A	A	A	A
<u>Ostrea edulis</u>	C	C	C	C	C	C	C
<u>Anomia ephippium</u>					C	C	C
<u>Heteranomia squamula</u>						C	
<u>Chlamys varia</u>	C	C			C	C	C
<u>Loripes lucinalis</u>	C		C				
<u>Mysella bidentata</u>						B	
<u>Acanthocardia echinata</u>						C	
<u>Cerastoderma edule</u>	A	A					B
<u>Parvicardium exiguum</u>	C	C	C				C
<u>Venerupis decussata</u>		C					
<u>V. pullastra</u>	B	B	B	B	B	B	B
<u>V. aurea</u>	C	C	C				
<u>V. saxatilis</u>		C	C	C	C	C	C
<u>Timoclea ovata</u>							C
<u>Petricolaria pholadiformis</u>						B	B
<u>Donax vittatus</u>					C		A
<u>Fabulina fabula</u>							A
<u>Macoma balthica</u>	B	B					A
<u>Scrobicularia plana</u>	C	C					
<u>Abra alba</u>	B						
<u>A. cf. longicallus</u>							C

	P-B	B-L	L-W	W-B	B-N	N-BH	BH-E
<u>Ensis ensis</u>		C				C	C
<u>Spisula subtruncata</u>		C					
<u>Hiatella arctica</u>						B	
<u>Pholas dactylus</u>	C	C			C	B	A
<u>Barnea candida</u>	C	C				B	A
<u>B. parva</u>						C	C

CEPHALOPODA

<u>Sepia officinalis</u>	C	A	A	B	C	C	C
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being off-shore forms, occur usually as empty shells cast up on the beach, although live Crepidula can sometimes be found. Phragmacones of Sepia officinalis from this coast have already been mentioned by Cooper and Palmer in the Conch. Newsletter (No. 48).

For numbers of species, the richest sections lay between Eastbourne and Brighton, at the foot of the Chalk cliffs, where 59 species were recorded. The most barren sections lay between Brighton and Littlehampton where only 17 species were recorded, and between Littlehampton and Pagham where 29 species were found. Probable reasons for this uneven distribution are given later.

GEOLOGY

Coastal outcrops of hard-rock formations usually produce bold cliffs, and wave-cut platforms supporting a flora of intertidal seaweeds. This is the natural habitat of herbivorous gastropods and byssally-attached bivalves. On the other hand, outcrops of soft formations produce muddy or sandy shores, usually backed by shingle, and cliffs are usually low or absent. The fauna tends to be dominated by infaunal bivalves, such as tellins and some cardiids. Frequently, the formation on the shore is masked by uniform stretches of mud or sand, but if it is not, it tends to be bored by the pholads and by the venerid Petricolaria.

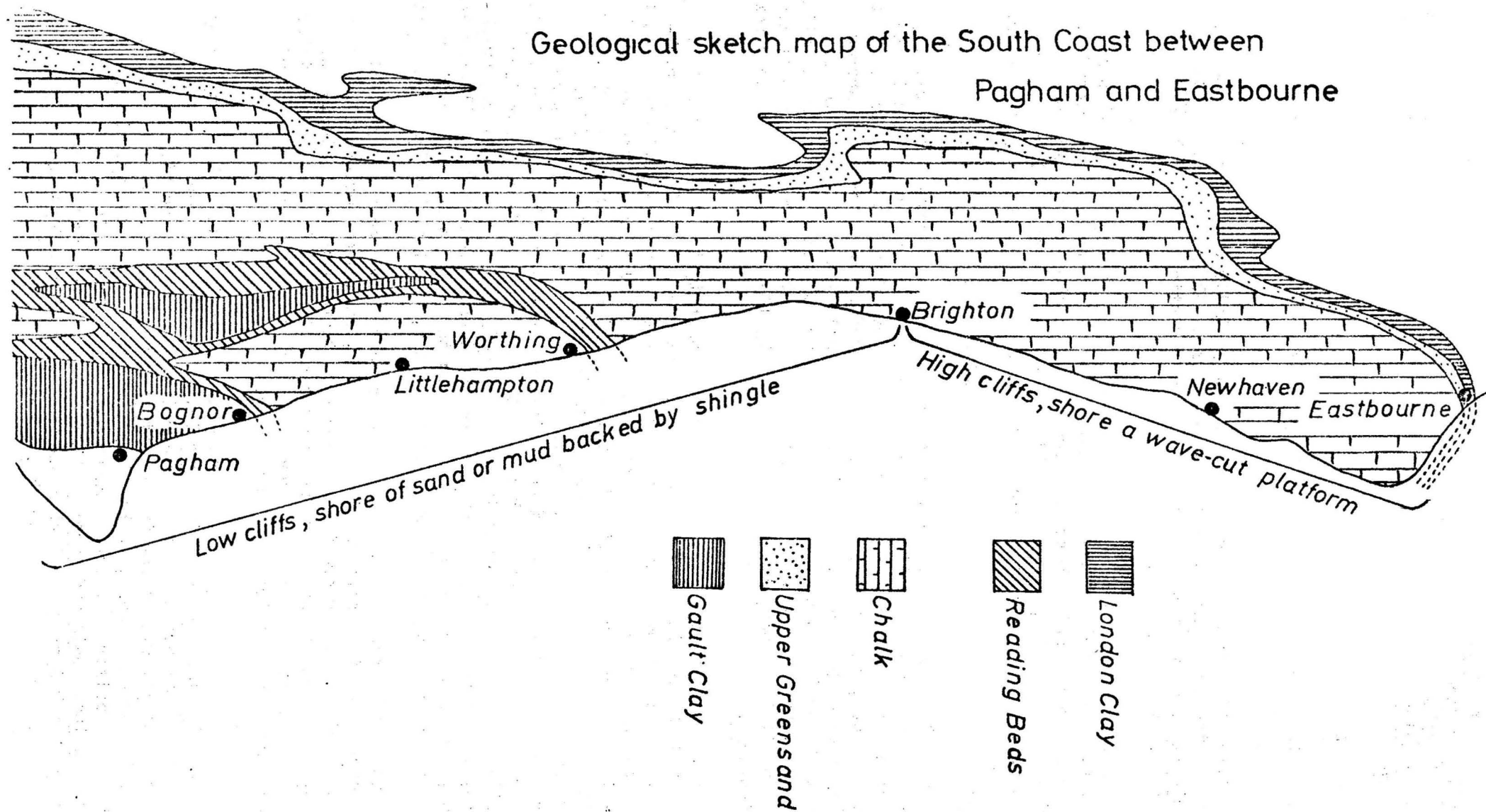
From Pagham near Selsey to Black Rock near Brighton the coastal topography is low and the sea is cutting into soft Quaternary coombe deposits, brick-earths, and also blown sands around Littlehampton. These superficial deposits rest upon the eroded top surfaces of the Chalk, Reading Beds, and London Clay formations, which surfaces lie either between tide marks or below LWMT. There are thus no cliffs along this 30 mile stretch of coast, and a uniform sandy-muddy beach, backed by shingle, stretches from end to end. These sands are the natural habitat of littoral infaunal bivalves, but owing to pollution they are rare or absent; the commonest shells on the beach are off-shore cardiids, venerids, and lucinids. Apart from the man-made structures of piers, breakwaters, and groynes, only the outcrop of the Bognor Rocks between Aldwyck and Bognor, and Barn Rocks further west, interrupts these soft-ground sediments with hard-ground habitats occupied by Littorina, Patella, Nucella, and Mytilus.

From Black Rock to Beachy Head the sea cuts into the Chalk formation, and from Beachy Head to Eastbourne into the Chalk, hard Upper Greensand, and the soft Gault Clay. The shore is a wave-cut platform backed by shingle and high cliffs, except at Newhaven and Cuckmerehaven. This platform supports intertidal seaweeds (absent from the sands west to Pagham) and the usual hard-ground herbivorous gastropods and mussels.

Between Beachy Head and Eastbourne the Chalk is abundantly occupied by Littorina littorea together with Patella. The hard Upper Greensand forms a good settling surface for barnacles and it is therefore occupied by their predator Nucella, with subordinate Littorina and Patella. The Gault Clay, where not covered by sand, is bored by Pholas, Barnea and Petricolaria. At Eastbourne a uniform stretch of clean sand contains the infaunal bivalves Donax, Tellina, Ensis and Macoma. These bivalves are rare or absent from sands between Brighton and Pagham where black foetid muddy-sand lies only a few inches below a clean-washed surface.

The Chalk substrate is of two kinds: from Eastbourne to Beachy Head only

Geological sketch map of the South Coast between
Pagham and Eastbourne



the softer Lower and Middle Chalk, without flints, occupies the shore and attracts little seaweed so that virtually only Littorina and Patella occur on it; from Beachy Head to Black Rock the harder Upper Chalk with flints outcrops on the shore and this supports a rich flora of seaweeds. Consequently the molluscan fauna is richest in this section, yielding even small herbivorous rissoids; and long gulleys on the shore often contain accumulations of shell debris which begin to approach the shell-sands of Devon and Cornwall for richness and variety.

SUMMARY

- 1) Between Pagham and Black Rock littoral infaunal bivalves are inhibited from occupying the sandy substrate by pollution of the shore. Hard-ground molluscs are confined to the Barn Rocks, Bognor Rocks and artificial structures.
- 2) From Black Rock to Beachy Head the uniform substrate of Upper Chalk with flints provides a habitat for herbivorous gastropods, chitons, bysally- attached bivalves, and boring pholads. The fauna is typically a hard-ground one and is the richest in terms of species.
- 3) From Beachy Head to Eastbourne three formations outcrop on the shore and this, together with the clean sand at Eastbourne, provides three different types of hard-ground substrates, and one soft-ground substrate at Eastbourne where clean sands contain infaunal bivalves which are rare or absent in similar, but polluted sands west to Pagham.

Thus, absence of pollution and variety of substrate accounts for the relative abundance of species in the two eastern sections; while pollution and a uniform substrate accounts for the barren central sections.

C. P. Palmer

SNAILS IN A DARTMOOR GARDEN

For the last two years I have been studying the snails in the market garden of 21 acres at Princetown, Devon. The garden is reclaimed moorland, the soil being heavy, peaty and rocky. The rainfall is high, 80 to 90 inches a year having been recorded. The altitude (1700 feet), lack of lime, and the long, cold winters combine to make this an inhospitable habitat for Mollusca.

In the centre of the garden is a mound of rubble, 20 x 40 feet and 15 feet high, the remains of a building demolished in 1946, now overgrown and blending with the moorland. This habitat is undisturbed and unlikely to be interfered with. On one side is a fast flowing stream and on the other a deep drainage ditch. The mound is inhabited by a colony of Helix aspersa, which occurs nowhere else in the garden; Cepaea hortensis also lives there.

I have kept some H. aspersa in a biscuit tin indoors, returning them to the garden at intervals. The snails which I handle regularly become quite tame. When one of them is placed on the table together with a strange snail it is soon fully extended and feeding, regardless of any approach, while the other withdraws at the first signs of approach and takes quite a time to gain confidence. An experiment which indicates intelligence is the following: half a dozen snails, some tame, others wild, are placed on a table with a variety of plants from their natural habitat, while on an adjoining table is placed a selection of more choice food. The 'regulars' then quit the feeding table and make directly for the choice food; this experiment has been repeated again and again. After feeding the tame snails always move towards me and lie outstretched with the tentacles retracted; the other snails move towards their 'den'.

I have observed snails mating and egg-laying in captivity; the young feed alongside the adults. I am hoping to carry out research into the behaviour of snails towards other species: the only one from which they recoil is Oxychilus alliarius. A more detailed account of the memory and intelligence of snails will be given in a subsequent article.

I have found the following species, kindly identified by Dr. M. P. Kerney, in the garden of H. M. Prison: Lauria cylindracea, Cochlicopa lubrica, Discus

rotundatus, Trichia hispida, T. striolata, Cepaea hortensis, C. nemoralis, Helix aspersa, Nesovitrea hammonis (=Retinella radiatula), Retinella nitidula, Oxychilus alliarius, O. cellarius, Vittrina pellucida. Arion ater also occurs and some other kinds of slug, but restrictions on posting live slugs and lack of facilities for preserving them have prevented me from availing myself of the offer of Mr. A. E. Ellis to identify them.

I should like to thank the Governor of H.M. Prison for allowing me to carry out research on snails, and to Mr. T. E. Crowley and other members of the Conchological Society who have so kindly written to me.

Frank Marshall

ADDENDUM. Dartmoor is notoriously an unattractive region for Mollusca. Boycott (Journal of Ecology 22:22, 1934) writes: "In an unproductive area, human settlements may indeed give a good foothold to a number of species without any definite domestic association." In the overgrown ruins of Snaily House near Postbridge Boycott (Journal of Conchology 19:343, 1933) found Lauria cylindracea, Cochlicopa lubrica, Discus rotundatus, Oxychilus alliarius, O. cellarius, Vittrina pellucida and the slugs Arion intermedius, A. circumscriptus, A. hortensis and A. ater (which occurs on uncultivated parts of Dartmoor). Helix aspersa was absent, though it is common in gardens in Postbridge.

MEETING OF NATIONAL BIOLOGICAL SOCIETIES

The annual meeting was held at Juniper Hall Field Centre, Dorking, on Saturday 10 November, 1973. Three representatives of the Society were present: Mrs. E. B. Rands, Dr. M. P. Kerney and Dr. J. E. Chatfield.

After informal discussion over coffee, the official programme began at 11.00. Many of the items were ones continuing from previous meetings and gave an account of progress since the last meeting in November 1972.

Red data books giving localities of rare and endangered species for the United Kingdom are in preparation, with the botanical one particularly well advanced. John Heath agreed to co-ordinate the red data book for invertebrates other than insects.

Codes of conduct. These are available from Monk's Wood. Members of this Society may be interested in the draft of the Geological Code of Conduct (prepared by the Geologists' Association).

Endangered Species. Again this year some money is available from the World Wild Life Fund pet food project for conservation of particular endangered species. This money could be used for fencing around the habitat of an endangered species or for a research student for 2-3 months to do some survey work. Anyone interested in making an application should apply to the Nature Conservancy Council, 19 Belgrave Square, London, S.W.1.

Centres for Environmental Records. A report of this conference held in Leicester, in March 1973, was given. A copy of the proceedings is obtainable at 45p from the Adult Education Centre, University of Leicester.

Lists of biological recorders. There was some discussion on the production of a handbook giving names and addresses of local and county biological recorders who may be unknown to national organisations. The conservationists, who are particularly in need of information and expert help, could then be put in touch with recorders in their area.

Report from B.R.C. Diana Scott gave an illustrated account of the work done when a set of record cards arrives at Monk's Wood, and outlined future trends. There is a possibility of housing a duplicate set of biological data on microfilm at the British Museum (Natural History). Some discussion followed on the amount of detailed information which can be fed into the computer from the individual species cards.

Future biological recording in Europe. John Heath reported on the European Invertebrate Survey Symposium in August this year (for a report see Conch. Newsletter No. 47).

Frank Perring emphasised the importance of taxonomic work before mapping schemes become too advanced. He also pointed out the role of museums in training volunteer recorders. Provisional atlases should be published quickly as in this way interest in the scheme can be maintained.

Biological Recording and Nature Conservancy Council. Richard Steele gave an account of recent changes as N.E.R.C. (National Environment Research Council) splits into two, the N.C.C. (Nature Conservancy Council) and I.T.E. (Institute of Terrestrial Ecology). The biological record centre is now under the I.T.E.. However the biological record centre will continue to co-ordinate records for marine schemes including our own on marine molluscs until alternative arrangements are made by the Government. Most of the decisions for research objectives in the future are to be made by the N.C.C.. An account was given of the role of various former N.E.R.C. establishments in biological recording.

Finally an account was given of a recent N.E.R.C. seminar on biological and climatic change. The overall conclusion from which was the need for more biological recording.

J. E. Chatfield

DISTANT FIELD MEETINGS 1974

1. FIELD MEETING IN MAJORCA

As all who registered for Majorca 1974 will know, it was eventually necessary to cancel this event, and this note is an apology to those who wished to come and for the information of other members.

Our run of bad luck started when Clarkson's Tours, with whom a booking had been made, wrote to cancel the arrangements. Eventually the deposits were returned and in the meantime tentative arrangements were made with Aerocruise. Overall this was slightly more expensive, but before things were finalised international events resulted in the petrol surcharges and taking all increases into account the cost of the weekend began to approach a figure 50% above our original estimate. But eventually it was not only cost that made us cancel, but a combination of circumstances including the threatening crises in the transport situation in late December that promised to make both correspondence problematical and overland transport to Gatwick for the early departure uncertain.

The first meeting abroad last year had been an exploratory event, whetting the appetite for more and, in fact, the party that registered for 1974 included many familiar faces from 1973. Several of us had attended day meetings after the initial excursion to share in the identification of finds, and on this second trip it was intended to develop particular interests, the land enthusiasts especially wishing to find the endemic species that had been missed in 1973. Alas, this was not to be, and our interests will have to be shelved until another meeting can be arranged. It is proposed that this be of about a week's duration in order to give better value for money, but it is probably best left until the economic and fuel situation becomes more stable.

2. PROPOSED FIELD MEETING AT HERM, C.I.

It is quite evident that enthusiasm remains for field meetings overseas, and enquiries at the Society's January meeting showed considerable support for a residential meeting in the Channel Isles, especially Herm. Although not truly foreign, this has the advantages of being less dependant on air travel, and the reputation of 'Shell Beach'. It is therefore proposed to hold a weekend meeting in late summer, possibly at the hotel on Herm itself. Appropriate dates seem to be September 6-9 or 27-30th. 1974, or perhaps Spring 1975.

A field meeting in this location would clearly have a marine emphasis, and

it should be possible to arrange to hire a boat. Land enthusiasts would have the opportunity to scour the entire island and still enjoy the sunshine.

Please let me know if you are interested, stating:-

- (a) your name, address, telephone number
- (b) the period that suits you best
- (c) whether you can take a full 4 day weekend or just Friday evening to Sunday
- (d) preference for surface or air travel (the last 3 miles have to be by sea)
- (e) any other information you think relevant.

If members travelled by air from London and accommodation was arranged in Herm, the basic cost would be about £35; whereas surface travel from Weymouth and accommodation in Guernsey might cost £15 (3 nights in each case). The latter would involve daily travel to Herm at 50p. Alternatively, I will investigate the possibility of a package which, although it would probably necessitate a Guernsey base, would cost about £20-25 from London.

B. W. Barrett, [REDACTED], Fareham, Hants.

P.S. Although the era of very cheap overseas travel is behind us, there are still some bargains to be had further afield and the cost can only rise. Locations such as the West Indies seem relatively economical, and I am making enquiries. Please write to me if you are interested.

B.W.B.

GENERAL NOTES

SNAILS AND THE LAW: TRESPASS, TORT OR MISDEMEANOUR?

A creature who so guilelessly
Puts out his horns to look at me
Is one I do not care to crush
Or fling to the remorseless thrush;
I have a heart too soft to harden--
I place him in my neighbour's garden.

Winifred M. Letts, Punch, 25 May 1927.

'Oh, are you in the movies?' 'No, I am a lawyer.' Amelia Bingham uttered a pleased cry. 'Then you can tell me if the woman next door has any right to throw her snails into my garden.' 'None whatever. Legally, snails are wild animals.' 'What ought I to do?' 'Throw them back.'

P. G. Wodehouse, Bachelors Anonymous, p. 123 (Barrie & Jenkins, 1973).

(from A. E. Ellis)

HELICODONTA OBVOLUTA (MULLER); ITS DURATION OF LIFE

Most land snails are annuals, completing their life span within 9-15 months (Boycott, 1934, p.4). Boycott adds, however, that life-spans determined from specimens protected in captivity are misleadingly long. I do not know whether anyone knows how long H. obvoluta lives in the wild; the following record of two specimens having achieved five years in captivity seems of interest.

The specimens (now in Liverpool Museums) were among the material acquired from the Salisbury collection, and bear the following label "These both died in captivity after about 5 years in feeding box". The specimens are marked as having come from Switzerland originally, and the handwriting on the label is unknown to me though he(or she) collected widely, judging from the amount of material present, all bearing labels in the same hand.

N. F. McMillan

Reference: Boycott, A.E., 1934. The habitats of land Mollusca in Britain. J. Ecol. 22: 1-38.

THE FIRST RECORD OF ARION LUSITANICUS MABILLE IN IRELAND

When reporting in 'The Conchologists' Newsletter, No. 25, p.40 (June 1968), the discovery of Arion lusitanicus in Co. Donegal by Dr. Mary Pugh, doubt was cast on Collinge's record of this slug from Bantry Bay in 1893, since Mr. Geoffrey Harper failed to detect any examples of this species in the Collinge collection at Cambridge, all the specimens so labelled proving to be A. ater s. lat. It is therefore of particular interest that five specimens of A. lusitanicus, collected in oak woodland at Glengarriff by Dr. M. J. Bishop, 20 September 1973, were amongst some Arions sent for identification. Accordingly the credit of being the first to record A. lusitanicus from Ireland may indeed be due to Collinge, even though no specimens of this species are now present amongst his slug collection.

A. E. Ellis

THE MARINE RECORDER

Having been elected Marine Recorder in succession to Mrs. Turk, I have a great deal to live up to in order to continue her excellent work. She has got the new phase of Census recording well under way. One thinks especially of the happy relationship with Area Representatives who are busy streamlining the system by putting in considerable time and effort recording data on Field Cards for each 10km square, the scheme now used for coastal mapping as outlined by Mrs. Turk in the Conch. Newsletter (No. 46). The National Grid co-ordinates are not entirely satisfactory for offshore localization of stations, but to enable recording of data to go ahead as rapidly as possible, the method of recording onto Field Cards is (until the matter is further discussed) left to individual recorders, the majority of whom are using latitude and longitude.

Copies of Master Cards for most Census Areas are available from the appropriate Area Representatives or myself, as are Master Cards for 10km squares for some Census Areas, depending on the stage reached in processing data. Anyone planning a field trip is invited to find out in advance the most useful places for recording or study in order that the best coverage may be achieved.

Labadie (Sole) (Area 40). Mr. N. A. Holme, The Laboratory, Citadel Hill, Plymouth, PL1 2PB has agreed to be representative for this area.

Edinburgh is hardly less remote than Cornwall, but I am always glad to see anyone in connection with the Marine Census, by appointment please, to be sure of catching me at home.

S. M. Smith

NOTICE

Research on an index patterned after C. D. Sherborn's INDEX ANIMALIUM is underway at the National Museum of Natural History, Washington, D.C. 20560, U.S. U.S.A. The coverage is Mollusca only, and plans are to include original references for names of species and subsequent references to publications including illustrations. The period of chronological coverage begins in 1850, where Sherborn ended, and continues through 1870 to provide an overlap with the ZOOLOGICAL RECORD. Persons having knowledge of or access to obscure pertinent references are invited to correspond with the compiler, Florence A. Ruhoff, Department of Invertebrate Zoology, Mollusks.

WANTED

I would like to obtain copies of the following books and would be grateful for any offers indicating price and condition: Jackson, J.W.: Shells as evidence of the migration of early culture. Longmans, Green & Co. London jointly with University Press Manchester, 1917. Kunz, G.F. & Stevenson, C.H.: The book of the pearl. Macmillan & Co., London, 1908. Dr. E. Sandor, [REDACTED], Woodford Green, Essex, [REDACTED]

Ellis, A.E. (1969): 'British Snails', Clarendon, Oxford. Please send offers indicating price and condition to: G. Hellman, [REDACTED], Brighton, Sussex, [REDACTED]

WANTED: All Conchological books, especially early ones; I also have some for sale. Particular books searched for if required. Write: G. S. Morrison, [REDACTED], Chelmsford, Essex.

FOR SALE

Mrs. P. M. Deeley, [REDACTED], Tuffley, Gloucester, wishes to sell the following: Journal of Conchology, Vol. 26, No. 6, Vol. 27, Nos. 5, 6 & 7, Vol. 28, No. 1; Conchologists' Newsletter, Nos. 30 - 47 (except No. 45). Papers for Students, No. 14, and a copy of the 'Concordance'. Any offers, please?

SHELLS FOR SALE: Browse in baskets full of shells from all parts of the world, at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (01-437 9391).

HON. SECRETARY

Please note that the Secretary will not be able to deal with any correspondence during the month of August.

FIELD MEETINGS 1974

Programme No. 3

Saturday June 15th.	Leicester Area. (A non-marine census survey)	Mr. I. M. Evans
Saturday July 13th.	Cassiobury Park, Watford, Herts. (Fresh-water Mollusca for beginners and juniors)	Mr. D. R. Worth
Saturday August 17th.	Dungeness, Kent. (Survey of marine census area 14)	Mrs. C. J. Pain
Sunday September 29th.	Joint meeting with the Northampton N.H.S.	Mr. G. Osborn
Sunday October 20th.	Autumn Slug Foray.	Dr. A. J. Rundle

For details of the above meetings, send S.A.E. to:

T. Pain, Field Meetings Organiser, [REDACTED],
Millbank, London, [REDACTED]

A separate application must be made in respect of each meeting.

Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

MY FRIEND, DR. LAVER, OF COLCHESTER

Recently I was able to add to my growing collection of books on conchology a copy of "Land and Freshwater Shells of the British Isles" (1880) by Richard Rimmer F.L.S. On page 3 I found the words: "Near Colchester (Laver)". These words evoked memories of my childhood, for not only am I a Colcestrian, but Dr. Laver was our family doctor for three generations.

After he had treated me for measles in 1897, and ordered 'plenty of rhubarb', I heard my aunts, the Misses Nightingale of 60 North Hill, discussing Dr. Laver: "What a clever man! Did you know that he collects snails"?

My 5-years old wisdom reasoned that my aunts would think that I also was clever if I collected snails, so borrowing an empty shoe-box, I went to the base of the two-trunked fig-tree in our garden where there was a large colony of what the gardener called 'hobmedods' and what scientists call 'Helix aspersa'. The box was soon filled and I paraded my 'cleverness' before my aunts. Instead of the expected praise, I was met with "Ugh! Horrible! Go and scrub your hands!"

This misunderstanding did not spoil my interest in molluscs, for by the time I was seventeen years old, I had given my first lecture on shells to Colchester Royal Grammar School Natural History Society and founded a Natural History Society in Colchester, (1909).

Looking further into Richard Rimmer's book, I found other reports from Dr. Laver, while on page 41, the author mentions "My friend Dr. Laver of Colchester" in the same paragraph as the great conchologist, John Gwyn Jeffreys, whose grand-daughter, now 97, is one of my most delightful friends. (She won three prizes for her poetry last year.)

With the help of Mr. J. Firmin, founder of the present Colchester Natural History Society, and Mr. P. R. Gifford, A.L.A., Borough Librarian of Colchester, I have gathered some facts about the remarkable Dr. Henry Laver, M.R.C.S., F.L.S., F.S.A., J.P., etc. He was not only a conchologist in two widely different spheres, but achieved success and fame in many other activities.

Henry Laver was born in 1829 at Paglesham, a village in the oyster region of Essex. His father, William Laver, was tenant of East Hall. Educated at Hadleigh and St. Thomas' Hospital, Henry settled in Colchester in 1857 to practice. Soon he was appointed senior surgeon to the Essex and Colchester Hospital.

As a naturalist, he joined the Essex Field Club, to which he read, on September 24th. 1881, an important paper on "The Land and Fresh-water Mollusca of the District around Colchester" - 10 printed pages. This contribution towards a list of the Fauna of Essex enumerated 75 species out of the 121 given for the whole of Great Britain by John Gwyn Jeffreys in his "British Conchology".

How many other papers Dr. Laver contributed before 1887 I do not know, but my nephew, John Appleby of London, has kindly sent me a list of 45 papers by Dr. Laver from the index of the Essex Field Club's Journal (1887-1930) in the British Museum. These include papers on Helix lapicida and Testacella haliolidea, both found at Colchester.

In 1892, the year of my birth, Dr. Laver was President of the Club, which, in 1898, published his valuable work on "The Mammals, Reptiles and Fishes of Essex."

In 1876, he was elected a member of the Essex Archaeological Society, serving on its Council and as local secretary for Colchester. He was its President from 1903 to 1908. His stupendous work as an archaeologist, particularly concerning the study and preservation of Colchester Castle and Roman remains, including the old town walls, might have eclipsed his work as a naturalist, but he returned to nature-study in a very special way by becoming Chairman of the Colne Fishery Board with its important industry of Oyster culture - as he jokingly said to a friend: "I am giving up archaeology to become a pedlar of oysters!" However, he could never give up archaeology, but in addition, he became Chairman of the Borough and Port Health Committee and also Chairman of Colchester Gas Company!

Mr. Horace Wilmer, F.S.A., one of his oldest friends, wrote of Dr. Laver in the "Essex Review", "To all these activities, he brought an alert and vigorous mind and a very retentive memory." He made a profound scientific study of the oyster and dealt with all its problems with intense clarity of mind.

In 1891, he wrote a souvenir booklet on "The Colchester Oyster Fishery", for distribution with the Toast Lists of the Annual Oyster Feast. His larger book on this subject was published in 1916 (now out of print). It deals authoritatively with the history and geography of the industry, its methods of working and the "Quality and Safety of its Products". This forward-thinking man was as conscious as any modern anti-pollutionist of the need to keep oysters clean and protected from toxic germs. His book is full of interesting and useful information, clearly expressed. It is a 'must' for any serious student of the subject.

His civic services to the town were incalculable. For many years he was an Alderman and in 1885-86, he was Mayor of Colchester.

Dr. Henry Laver died in 1917, at the age of 87, leaving a widow ('my old dear', he called her), one daughter, two sons and a grand-daughter.

One of his sons went abroad. The other, Dr. Philip Guyon Laver, F.L.S., F.S.A., etc. followed his father's profession and inherited his talents and enthusiasm for archaeology. Father and son are, together, commemorated and honoured by a Memorial Tablet placed by the grateful town in Colchester Castle Museum to which they had devoted so much skilful service.

The visitor to Colchester may be surprised to find three excellent museums, each quite different, and an art gallery of unusual charm. If he or she has read this article, they will not be surprised to learn that, for many years, Dr. Henry Laver was Chairman of the Museum Committee of the Colchester Town Council.

Wilfrid M. Appleby, O.C., F.I.P.S.

THE YORKSHIRE CONCHOLOGICAL SOCIETY - MOLLUSCAN REPORT

Summary of the past ten years.

The Annual Report of the Y.C.S. for 1962 announced the introduction in Yorkshire of the 10Km. square recording scheme as organised by the Conchological Society. This is a summary of the results of this scheme within the Yorkshire area, with a special note of some of the many interesting and important records that came to light.

The state of the mapping scheme at the end of 1973 shows a degree of examination of every one of the 180 plus squares of which Yorkshire is all or part. About 20% of these are now in excess of 60 species, a further 20% is probably at the maximum possible number of species for each. This leaves a further 60%, or more than half the county with a recording cover that can only be said to be adequate, further examinations being required. In particular

some of the areas in the North-West corner of the county are still in need of attention particularly in wet marshy areas where a number of new vice-county records could still be forthcoming.

Some of the more interesting records:-

Viviparus contectus Millet

A very local species in the county, restricted mainly to the low-lying land between York and Doncaster. On the 20th. of July 1968 a single living specimen was taken in a ditch near Melbourne on the banks of the Pocklington Canal in East Yorkshire (NGR 44/745448). This confirmed a record for the area dating back to Dr. Martin Lister who recorded it from Wressle close by, over 150 years previously.

Menetus dilatatus (Gould)

This very interesting introduction to the molluscan fauna is now known in England only from one site in Yorkshire where it was re-discovered by M. J. Morphy of the Huddersfield Polytechnic. I must, however, keep the exact site under my hat for the moment whilst a study of the area is in progress. The Yorkshire site in comparison with the localities described by Peter Dance from the Trawsfynydd Reserve in Mid-Wales is very different. In the Huddersfield Canal the animal lives attached by its muscular foot to tall herbage growing out of more than a foot of water, competing for space and food with large numbers of Potamopyrgus jenkinsi (E.A. Smith).

Arion lusitanicus Mabilie

This species was first recorded from waste ground in the centre of Leeds in November 1966, and despite an intensive search for it in other localities, this remained the only site in the county for many years. In April 1973, however, a second site was discovered in an old garden in the centre of Withernsea on the Yorkshire coast. These two localities remain the only sites known in the county, but other records should come to light in the future.

Vitrea diaphana (Studer)

The discovery by Mrs. M. Fogan of this, a new species to Britain, in Oxember Wood, Austwich (NGR 34/7868) in May 1966 stimulated a lot of interest; the results of which will be seen on the production of the forthcoming distribution maps. It is now known from a wide area of the Yorkshire dales and can be said to be common, but its small size makes it very difficult to locate in the limestone screes.

Limax tenellus Muller

The erratic behaviour of this species perhaps accounts for the very few records which have come to light over the years. Three old records and one questionable record from Colt Park Wood in 1962 were the only ones known when, in October 1971, a very large colony was discovered in Ravens Ghyll, near Pateley Bridge (NGR 44/153642), and also a few days later two adults were found by L. Lloyd Evans at Grewaltherpe (NGR 44/243770). Both of these records came from V.C. 64, a vice-county from which it had not previously been recorded. These two sites were examined in subsequent years but apart from two juveniles taken in October 1972 in Ravens Ghyll it has not been seen since.

Agriolimax agrestis (L.)

Since the original discovery by R. A. D. Cameron on Ha Mire, Malham Tarn in August 1970 (NGR 34/8966), A. agrestis has been found in three other Yorkshire localities. A second by R. A. D. Cameron on Green Hill Scar, Malham in August 1972 (NGR 34/8869), near Fleet Moss $3\frac{1}{2}$ miles South of Hawes at an altitude of 1,850 ft. (NGR 34/861841) (Altitude record for Britain) collected by L. Lloyd Evans in September 1972 and Langthwaite, Argengarthdale in September 1972 (NGR 45/0002). An intensive examination of other high altitude limestone pastures may produce other records for West and North-West Yorkshire, but as yet no records have been found below 1,000 ft. in height.

Anodonta minima Millet

The difficulties involved in the identification of Anodons in the past resulted in this species being overlooked in most cases. In recent years it has been recorded from the Rivers Derwent, Ouse, Nidd and Wharfe, all of which drain out into the Humber. It is possible therefore that it will be found in most of the rivers draining into the Humber basin.

Pisidium pseudosphaerium Favre

Only one specimen of this bivalve has ever been found in Yorkshire, by R. H. Lowe in a small marshy pond near Croft, North Yorkshire (NGR 45/273082). The very large deposit of post-glacial marl found at Burton Salmon in West Yorkshire produced large numbers of this species, the first time it had ever been recorded as a fossil in Britain.

Pisidium moitessierianum Paladilhe

M. J. Morphy found a single valve of this rare bivalve in a sample taken from the bottom of the Huddersfield Canal.

The results of recording on a 10 kilometre square basis can best be seen by the number of new vice-county records which have come to light. Yorkshire was very well recorded prior to the scheme but a total of something between 80 and 100 new vice-county records have been accepted since 1950. The number depends on the acceptance or otherwise of aggregate species like the Arions.

For further information on Yorkshire Molluscan records over the past ten years, see the following published notes:

The Naturalist

1963 : 12	Y.N.U. - Annual Report for 1962
1964 : 20	Y.N.U. - Annual Report for 1963
: 153	Combined reports of the Y.N.U. field meetings held in 1964
1965 : 17	Y.N.U. - Annual Report for 1964
: 149	Combined reports of the Y.N.U. field meetings held in 1965
1966 : 13	Y.N.U. - Annual Report for 1965
: 113-118	New Records of Holocene Mollusca from East Yorkshire, Patrick J. Boylan
1967 : 8	Slugs new to Leeds, J. Armitage and A. Norris
: 14	Y.N.U. - Annual Report for 1966
1968 : 11-12	Y.N.U. - Annual Report for 1967
: 129-30	Combined reports of the Y.N.U. field meetings held in 1968
1969 : 9-10	Y.N.U. - Annual Report for 1968
: 85-88	The Biology of "Old Den" in the Humber Estuary, P. P. Morgan
1969 : 129	Report on the Y.N.U. field meeting to Lastingham, VC62
: 130	" " " " " " " Brandesburton Gravel Pits, VC61
: 134	" " " " " " " Jervaulx Abbey, Eel mire and Swinton Park, VC65
: 136	" " " " " " " Halton Gill, VC64
1970 : 21-22	Y.N.U. - Annual Report for 1969
: 145	Report on the Y.N.U. field meeting to Hutton Rudby, VC62
: 148	" " " " " " " Birkin, near Sherburn in Elmet, VC64
: 151	" " " " " " " Nappa Scar, near Askrigg Wensleydale, VC65
1971 : 12-13	Y.N.U. - Annual Report for 1970
: 57-63	An Account of the Deposit of Shell Marl at Burton Salmon, West Yorkshire. A. Norris, D. D. Bartley and G. D. Gaunt
: 134	Report on the Y.N.U. field meeting to Kingsdale, Ingleton, VC64
: 136	" " " " " " " Hunmanby, VC61
: 140	" " " " " " " Hovingham, VC62
: 144	" " " " " " " Bishopdale, VC65
: 148	" " " " " " " Hardcastle Craggs, VC63
1972 : 24-25	Y.N.U. - Annual Report for 1971

1972 : 151	Report on the Y.N.U. field meeting to Masham & Tanfield, VC65
: 153	" " " " " " " " Kepwick, VC62
1973 : 15-17	Y.N.U. - Annual Report for 1972
: 29-32	<u>Potamopyrgus jenkinsi</u> (E.A. Smith) at Malham, with particular reference to its invasion ecology, P. Calow
: 70	The Occurrence of <u>Boettgerilla pallens</u> Simroth, a slug new to Britain, in the English Lake District, B. Colville, L. Lloyd Evans and A. Norris
: 71-73	Conchological Section - Marine Survey Reports for 1972
: 139	Report on the Y.N.U. field meetings to Wilton Woods and Teesmouth, VC62
: 142-4	" " " " " " " " Elvington, near York, VC61
: 149	" " " " " " " " Mickletown, near Castleford, VC63
: 151	" " " " " " " " Lofthouse, Upper Nidderdale, VC64

I would like to thank all those members of The Yorkshire Conchological Society for all the "work", help and encouragement they have given me over the years.

A. Norris, Recorder, Y.C.S.

THE GENUS NEPTUNEA IN BRITAIN

Those of us who live in S.E. England and whose acquaintance with our only living representative of the genus Neptunea, N. (Sulcosipho) antiqua (L.) is confined to specimens collected at such places as Sandwich, Kent, where it is common, may be excused from knowing that it is the largest British Gastropod. Shells from the south east never exceed 100 mm. in length, but in the northern North Sea and off Ireland shells up to 200 mm. in length are sometimes obtained by trawlers.

Jeffreys (1867) noted that N. antiqua was good bait for codfish and a favourite delicacy of the lower working-classes in London. At Billingsgate it was sold under the name of "almond" or "red whelk"; the tail (liver) was said to be more fat and tender than lobster. As an article of food however, it is now apparently entirely replaced by the "common whelk" Buccinum undatum (L.). Large shells of N. antiqua var. alba (Jeffreys) were used by the Shetland Islanders as lamps, the body-chamber was filled with oil and the wick protruded through the siphonal-canal. The shell was then suspended from the ceiling.

N. antiqua is a northern cold-water species and although common in the North and Irish Seas is very rare west of the Straits of Dover. Like all other "whelks" N. antiqua is an epifaunal scavenger. The eggs are contained in cases or capsules, which overlap one another in an imbricated fashion. They are deposited in clusters of from a dozen to a hundred, the capsules in each cluster being equal in size. They spawn at the end of winter and later perfect little snails emerge from the capsules. There is no free-swimming larval stage and distribution must therefore be by crawling only and consequently very slow indeed!

N. antiqua inhabits the Coralline zone and extends downwards to deep water. When crawling it holds its shell with the apex up so that it never drags the apex or other parts of the shell over the ground. Neptunea like Buccinum and Murex, moves almost exclusively for the purpose of scavenging. It crawls usually with the broad foot 10 mm. deep in the sediment. It tips its shell forward and downward and pushes the elongate siphonal process into the substrate forward of the front edge of its foot. In this way the sediment is plowed up and pushed sideways. The shell with the siphonal process is moved slowly to and fro while the animal crawls. During this activity the siphon lies protected in the siphonal canal and is never extended as far as in a moving Buccinum. The animal ploughs through the sediment in order to find dead organic material. When the animal crawls about in its search it disturbs the upper sediment layers considerably, down to a depth of 15 mm.

When prosobranch shells have a siphonal (i.e. anterior canal) the canal encloses a muscular and generally mobile siphon from the dorsal side; this extension of the mantle protrudes beyond the shell. A siphon is usually accompanied by a sensory organ (osphradium) which lies at the opening of the siphonal tube in the mantle cavity. Experiments have shown that the osphradium of prosobranchs tests the water for smells. Whereas the existence of an anterior canal on a shell indicates that the carrier must have been a predator or scavenger (e.g. Neptunea) its length does not give any information about the use of the siphon and the environment in which it is used. If the anterior canal is short and flared at the end as in Buccinum, the siphon is used to test for smells in open water, if however the anterior canal protrudes far (usually in the direction of the shell axis) the canal surrounds the siphon entirely, even when it is extended. Together with its protective calcareous cover it can be moved through the sediment, and can search for dead organic material in the water of the interstices between sand grains.

The genus Neptunea indigenous to the North Pacific, probably originated in Japanese waters during the Eocene period. Early Oligocene demes evolved in a boreal habitat, their descendants migrating northward. During the Beringian transgression demes of N. tabulata and N. lyrata stocks penetrated the Bering straits and spanned the Arctic, where the N. despecta and N. heros stock originated and dispersed; reached the North Atlantic via Iceland and eventually the North Sea; where in the early Pleistocene the sinistral N. contraria angulata (S.V. Wood) became abundant. Fossil shells of this sub-species are very common in the Red Crag (Lower Pleistocene) of Walton-on-Naze, Essex. By Upper Pleistocene times N. c. angulata had vanished and was replaced by N. antiqua, still living in the area.

The occurrence of N. despecta (L.) in the Red Crag, in spite of the claim of Harmer (1914-1925) remains unproven, most of his so-called despecta being referable to the striated form of N. antiqua. At the present time N. despecta is Arctic in distribution, the writer has, however, specimens of it dredged in the Shetland-Faroe channel, which would appear to be its most southerly occurrence on this side of the North Sea. The distribution shown for this species by Golikov (1963, 156) which included the southern North Sea as well as the west coast of Ireland and the Irish Sea is certainly based upon erroneous information, as is the same author's suggested distribution for N. (S.) antiqua (L.), which certainly does not extend its range so far south as he would have us believe.

In addition to the typical form of N. antiqua as found in S.E. England, a comparatively small shell, usually brown in colour and up to 100 mm. in length, the following varieties have been named and described by J. G. Jeffreys (1867), var. alba, white and very large, up to 200 mm. in length, the interior of the aperture often bright orange in colour, var. ventricosa thinner, the aperture often greatly expanded, var. striata, elongate, with strong spiral striae, especially on the upper whorls and var. gracilis, slender, thinner, and spirally ridged, a rare form found off S. Ireland. Sinistral (left-handed) monsters also occur, which are in no way related to the normally sinistral N. contraria (L.).

With the exception of the typical form and occasionally the var. alba in the north, none of the above-mentioned varieties are likely to be obtained by shore collecting. All live in deep water and can be collected only by dredging or from fishing boats.

References

- Jeffreys, J.G., 1867, British Conchology, 4 vols., London.
 Harmer, F.W., 1914-25, The Pliocene Mollusca of Great Britain, Palaeontographical Soc., 2 vols.
 Golikov, A.N., 1963, The Moll. gen. Neptunea Bolten. Fauna SSSR. Zool. Inst. Akad. Nauk. SSSR. 5.

T. Pain

From October till April Helix aspersa slept in an open cardboard box in my cell, where they were subject to a fair amount of movement and disturbance and even fell on the hard floor with little harm. After this long rest the warmer weather of spring brought signs of life to my animals. They were fed on damp bread, which experiments have shown encourages snails to come out of their shell. Now I prepared to find out what I could about this particular species, and with the help of members of the Conchological Society I have been able to study H. aspersa and other snails found in a market garden on Dartmoor. I would like to thank the Governor of the Prison for allowing me to carry on research work.

I returned my snails to the garden, where H. aspersa only occurs in one place, a mound of rubble, in the garden of 21 acres. The next thing was to find out how to keep them in my cell, where I could study the habits of H. aspersa under unnatural conditions. I made a simple den out of a biscuit tin, in the bottom of which I placed soil and two pieces of rock from the mound. First I brought in six snails, three of those I had taken out, and three fresh ones. Firstly I placed them on a bedside table (18 inches high) on which were young and old cabbage leaves and bread. After about half an hour the snails came out and began to explore and feed. Any attempt at approach made them withdraw into the shell. After repeating the process of bringing them to the feeding table, they became reassured that there was no danger and could be approached without withdrawing. Once placed in their den, they would climb up to the rim and proceed along it, making no attempt to leave the den, which had no lid. At first I had visions of returning to my cell after work to find snails all over the place, but at no time did they leave the box unless I placed it on the feeding table. When I place the den on the table, snails which I have handled regularly climb out of the box on to the table. I always spread a film of water over the highly glazed top of the table. After constant handling the snails become quite tame and climb on my hand. They continue to feed while I gently stroke the side of their head. After feeding they lie fully stretched out, with the eye tentacles withdrawn.

During the following months I took them back and forth between cell and garden. By marking the snails which spend time in my cell I have found evidence of memory. Strange snails when first brought into the cell are reserved, and time is needed to encourage them to accept the new surroundings. However, when I collect my regulars and place them on a table in the garden shed before bringing them in, within a few minutes they start exploring. The marked snails move about and crawl on my hand while strangers remain in the shell, showing that the former are tame or trained, which is a strong indication of memory. A snail which has been my constant companion for the last few months is replaced on the mound at intervals, sometimes from Monday to Friday. I can always find it in the same area, although there is a flourishing community. As soon as I pick up this snail and place it on the palm of my hand it becomes active. When placed on the table in the shed it stays there feeding or exploring, and after a time will climb on the box used for bringing it into the cell. A strange snail will stay in the box until it is brought indoors. Ten strangers which were brought in with my pet stayed in the shell, but he was soon out, paying no attention to the others. After a short period the others became quite tame. I have placed this particular snail, Sam, on the floor and watched it move towards the table. When I placed my hand near the animal it moved towards me and climbed on my hand. The evidence for Helix aspersa possessing memory and intelligence is very strong, and although much has been written about it, the detailed study of the habits of this animal is a wide open field.

Frank Marshall (Sept. 1973)

POMATIAS ELEGANS (MULLER) IN LINCOLNSHIRE (VC54)

On 3rd. October 1973 the author made what might be called a pilgrimage, to the Louth district to establish if Pomatias elegans still survived in north Lincolnshire (VC54). This species was known to Dr. Martin Lister, who recorded it in 1678 from Burwell Woods. H. Wallis Kew found it at Grisel Bottom,

Burwell Woods, in 1886, and C. S. Carter recorded it from the same site in 1901.

Enquiries were made of one or two people met in the vicinity of Burwell Woods, but the location of Grisel Bottom was apparently unknown. In order to find a habitat suitable for Pomatias elegans the eastern side of the wood was investigated, and depressions followed in an attempt to find a chalk outcrop in the clay. Nothing suitable was found in the wood, there being much Pteridium aquilinum (Bracken) on heavy clay with only the occasional piece of chalk at the surface. On the assumption that the wood may have been larger in 1901 a nearby chalk pit was investigated, but without success.

As a last resort the road towards Burwell village was explored. Almost adjoining the south west corner of the wood, at 53/369799, the road runs through a narrow valley which has a flat bottom and steep, wooded sides. There was a considerable amount of free chalk at the surface, and as the site looked inviting the slopes were investigated. On the bed of the valley and for some way up the sides the dominant plant was Mercurialis perennis (Dog's Mercury) with Urtica dioica (Stinging Nettle). Canopy was provided by Fraxinus excelsior (Ash) and Acer pseudoplatanus (Sycamore) with the occasional Crataegus monogyna (Hawthorn). The valley was aligned on a SW - NE axis.

Good numbers of empty shells of Pomatias elegans were found, with comparable numbers of empty Helix nemoralis and Retinella nitidula. Larger numbers of Pomatias elegans shells were found on the friable soil on the south facing slope, and it was here that the only live specimen was observed. It may be relevant that there were more chalk fragments on this slope. Although the writer wished to firmly establish the existence of a colony digging was not resorted to in an attempt to locate further live specimens.

Associated molluscan species at this site were:

<u>Clausilia bidentata</u> (Strom)	<u>Arion ater</u> agg.(L.)
<u>Arianta arbustorum</u> (L.)	<u>Euconulus fulva</u> (Muller)
<u>Helix nemoralis</u> L.	<u>Oxychilus helveticus</u> (Blum)
<u>Hygromia hispida</u> (L.)	<u>Retinella nitidula</u> (Drap.)
<u>Hygromia striolata</u> (Pfeiffer)	<u>Vitrina pellucida</u> (Muller)
<u>Monacha cantiana</u> (Montagu)	<u>Limax maximus</u> L.
<u>Helicella virgata</u> (da Costa)	<u>Discus rotundatus</u> (Muller)

Since the above visit Grisel Bottom has been found on Bryant's 1828 1 inch to 1 mile map of Lincolnshire. In fact this site is, or rather was, in Haugham Wood north of Burwell, and is now a small patch of woodland isolated from the main wood. According to Miss E. J. Gibbons, F.L.S., the county botanist, Grisel Bottom is a natural amphitheatre of old woodland on surface chalk, and the bottom is a boggy hollow. The location is 53/348819.

The only other site in Lincolnshire from which living specimens of Pomatias elegans have been taken in the past is at Welton le Marsh. Here J. F. Musham recorded, in Lincolnshire Naturalists' Union Transactions for 1908, that it was "common alive". The species was recorded again in 1934 when "30 shells were seen". Miss Gibbons recalls the 1934 visit, when she was shown living "Cyclostoma elegans in a quarry in Welton Wood at G.R. 53/461702. The site was a mass of Dog's Mercury at the end of a ride, but is now spoilt by dead tree stumps".

The writer hopes to visit Grisel Bottom and Welton Wood quarry during 1974 to assess the present status of Pomatias elegans in Lincolnshire, 295 years after it was first recorded by Lister.

E. J. Redshaw, 27th. October 1973

REVIEW

From the Diary of a Snail by Günter Grass, translated from Aus dem Tagebuch einer Schnecke by Ralph Manheim. Secker & Warburg, London, 1974. Price £2.75

The author, eulogized on the dust-jacket as Germany's most famous literary

figure, "uses his extraordinary powers to define the role of art in analysing life, and then to transmute the life he describes into a unique artifact. About his central symbol, the snail that is both a model and a parody of social progress, he constructs an integrated and absorbing novel that defies classification." It also defies reviewing, for to the prosaic mind of a mere biologist the book is no more intelligible than the above quotation from the publishers' blurb. One can however follow the fortunes of a central character, Hermann Ott, a Jewish schoolmaster from Danzig, with an enthusiasm for snails and slugs, who survives the last world war hidden in a cellar. The daughter, Lisbeth, of his protector brings him snails from the cemetery and "he revived an ancient Egyptian snail game" and "organized races between snails of like and unlike species. The table top measured four feet by two feet eight; a surface sufficient for qualified snails to engage in every track event from the (in snail measure) hundred-yard dash to the two-mile run, and after a while in the exciting hurdles." "With a chalk solution, to which a dash of ammonia had been added, he marked off straight lines on his table top. None of the competing snails ever crossed the dividing lines." The bait was salad, carrot, mushroom and sliced potato, and the victors were rewarded with bread soaked in milk. "When on one occasion two Roman snails broke off their race, pressed their creeping soles together, raised them up, secreted calcareous darts - known as love arrows - thrust them into each other's soles, and played their hermaproditic game, he disqualified them both."

"It must be possible to find an antidote for time in the substance of snails." "A snail - always on the move - hasn't got any fixed positions." "The word 'paradise' frightens my snail....For it remembers only too well the strict requirements for admittance and the obscurantist house rules. It knows that total banishment awaits those whose conduct is unsuited to paradise" (cp. "Paradise Lost?", Newsletter No. 49). "When the snail met itself coming in the other direction, it regarded itself as refuted. 'This won't do!' it cried out. 'I say that up front is up front.' After hesitating in its own way, it changed direction and soon met itself again. 'So I was right after all. Up front is up front.' It turned and moved away from each other."

Although the reviewer was consulted about the names of molluscs, he disclaims responsibility for "Agriolimax maximus" on page 211, which brought happiness to the immured Ott. It is gratifying to know that he now lives in retirement with his Lisbeth and occasionally gives lectures on the snail as an ancient fertility symbol and its medicinal properties (Lisbeth having been cured of melancholia by the application of a strange slug). The jacket design features what appears to be a sinistral and a dextral *Parmacella*.

A. E. Ellis

LITTORINID SYMPOSIUM

A one-day Symposium on Taxonomic Trends in the Littorinidae was held at the Royal Scottish Museum, Edinburgh, on Tuesday, March 19th. The Symposium, the first restricted to this family of the prosobranch Gastropoda, was chaired by Sir Maurice Yonge and attended by 37 people with interests in the Littorinidae. Talks were presented on a range of littorinid topics; probably the most noteworthy contribution was unpublished evidence given by Dr. J. Heller that the polymorphic species Littorina saxatilis (Olivi) should be regarded as containing at least four separate species.

The meeting unanimously endorsed the suggestion that an informal Littorinid group should be formed, with an international membership, as far as possible comprising all workers actively interested in these gastropods. This idea had previously received postal support from over 20 others, mostly from abroad, who were unable to attend the meeting. Anyone wishing to learn more about the group should write to the appointed coordinator, Charles Pettitt, Manchester Museum, The University, Manchester M13 9PL, England.

At the meeting Mr. Pettitt displayed a proof copy of the Indexed Bibliography of the Family Littorinidae (Gastropoda:Mollusca) 1758-1973 compiled by him and now published by the Manchester Museum (M.M. Publication N.S.4.74). This bibliography, printed in A4 size with 'plasticised' covers, contains about

730 references to world-wide Littorinidae; there is a subject and a general systematic index, with a special index of new generic and specific descriptions. The price is £0.75, but the author has arranged that individual workers and members of recognised conchological societies may order a personal copy at cost price, £0.50. To both prices should be added 8p postage in U.K., 15p overseas. Requests should be sent to Charles Pettitt, at the above address; cheques, etc., should be made payable to Manchester Museum.

THE FIRST IRISH RECORD OF ARION LUSITANICUS MABILLE

Dr. M. P. Kerney has drawn my attention to a short paper by W. E. Collinge, entitled "Description of the Anatomy etc. of a new Species and Variety of Arion", Ann.Mag.Nat.Hist.(6)12:252-254, pl.9, Oct.1893. The new species, collected at Schull, Co. Cork, by R. A. Phillips, is regarded by the author "as a form intermediate between A. lusitanicus, Mabilie, and A. subfuscus, Drap., both of which species occur in Ireland. It also forms a link between the empiricorum and subfuscus group of Pollonera." The description and figures of A. flagellus agree so closely with A. lusitanicus that it must be regarded as a junior synonym of the latter. This confirms the discovery of A. lusitanicus in Ireland (and in the British Isles) over 80 years ago.

It is suggested that Arion brevieri Pollonera (= A. hibernicus Brevière) is also synonymous with A. lusitanicus. This opinion is based on the description in L. Germain, 1930, Faune de France 21:74.

A. E. Ellis

(Refer to Conchologists' Newsletter, No. 49, p. 384)

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE A.(N.S.) 92

ANNOUNCEMENT

Required six-months' notice is given of the possible use of the plenary powers by the International Commission on Zoological Nomenclature in connection with the following cases: (see Bull.zool.Nomencl. 30, parts 3/4, 28th.June 1974 and 31, pt. 1, 31st. July 1974)

1923 Designation of a type-species for Latona Schumacher, 1817 (Mollusca)

2039 Designation of a lectotype for Ammonites defossus Simpson, 1843 (Ammonoidea)

2041 Suppression of Loligo stearnsii Hemphill, 1892 (Mollusca, Cephalopoda). Comments should be sent in duplicate, citing case number, c/o British Museum (Natural History), Cromwell Road, London, SW7 5BD, England. Those received early enough will be published in the Bulletin of Zoological Nomenclature.

Margaret Green, Scientific Assistant

GENERAL NOTES

SLUGS

In future slugs for identification or for verification for the vice-county or 10Km square Census programme should be sent to Mr. Adrian Norris, Dept. of Natural History, City Museum, Municipal Buildings, Leeds, LS1 3AA. Living material is preferable, suitably packed but not labelled 'livestock' on the outside of the packet. Alternatively the specimens should be killed by drowning and then placed in 30% Industrial Methylated Spirit, gradually increased in strength to 70%. In the case of living slugs, do not place the label inside the container, as it may be eaten by the inmates. Avoid posting slugs in hot weather or when they are likely to be long in transit, as at weekends or bank holidays.

CENTENARY OF THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND - 1976

Members will be interested to know that a number of ideas and suggestions have been considered for the celebration of our Centenary in 1976.

The Northamptonshire Natural History Society has its Centenary in the same year and it is proposed that we should hold a joint dinner with that Society.

The Post Office has been approached to see if they will issue a special postage stamp to mark the occasion and we are awaiting a decision.

There have been suggestions that we should produce one or more souvenir items, such as a tie.

However, we should like to have all the ideas and suggestions that members can muster. Please send them in soon, for although 1976 may seem a long way off, it takes a great deal of time to make plans and execute them and we want all the members to feel as much involved in this occasion as possible.

P. E. Negus

EDITORIAL NOTE

It is requested that all papers relating to any aspect of research on Mollusca and which are submitted for publication in the Journal of Conchology should include a statement as to where voucher specimens of the species involved have been deposited. This is to enable examination by individuals who in the future wish to duplicate or check the results reported.

Repeating an experiment requires duplicating the conditions under which the original procedure was carried out. While virtually all experimental papers today carefully delineate the procedures followed and the methods of data analysis, one critical factor is often overlooked. The organism may be cited by name, but only infrequently is the exact locality specified from which the material was obtained, and only rarely are voucher specimens cited as having been placed in a permanent repository. This often means that one of the most important parameters of the initial experiment, the identity of the organisms used, cannot be verified.

Ideally the material should be deposited in a National or major museum collection, and the museum catalogue number be quoted in the published paper, so that the material so deposited can readily be retrieved in answer to future requests.

The co-operation of contributors to the Journal of Conchology is requested.

MEDICINAL MUSSELS - 112 A FISTULA

351 Wash Muscle-shells clean; burn them to powder: sift them fine: mix them with Hogs-Lard; spread it on clean Wash-Leather, and apply it. This cured one that was thought to be at the point of Death. - N.B. This cures the Piles.

John Wesley, "Primitive Physic or, an easy and natural method of curing most diseases" (London, New Chapel, City Road, 1747; this extract is from the 22nd. edition, 1788).

"THERE'S A LONG, LONG TRAIL A-WINDING -"

How doth the melancholy snail
Invigorate his friends,
By looking back upon his trail
And wondering where it ends.

Cyril Hare (Judge Gordon Clark), "Suicide Excepted" (1939; Penguin Books, 1956).

Wherever a good snail goes
He leaves a silvery track,
So if he is far from home,
It leads him safely back.

Ruth Ainsworth, "The Tale of a Snail" (London, B.P.C. Publishing Co., 1961; Purnell Bobtail All-colour Book, 1969).

(from A. E. Ellis)

JOURNAL OF CONCHOLOGY BACK NUMBERS

The Society would like to buy a few copies of the Journal of Conchology, Vol. 27, Parts 1, 3 and 4 only, and is prepared to pay £1 per part for these.

Will any members who have these for disposal please forward to the Hon. Editor, Dr. C. R. C. Paul, Dept. of Geology, Liverpool University, Liverpool L69 3BX, who will arrange for the Hon. Treasurer to send cheques in payment.

N. J. EVANS (a post-graduate research student), Dept. of Zoology, The University of Liverpool, P.O. Box 147, Liverpool L69 3BX, is working on biochemical variation in Limax flavus and Arion ater agg.. Will any readers who know where a number of specimens of L. flavus can be collected, be kind enough to write to him giving detailed information.

THE UNIVERSITY OF PISA has the shell collection gathered by the Grand Dukes of Tuscany. The collection has fallen into disorganization and is presently being re-located. Prof. Enrico Bombieri is going to reorganize the collection in the next few years. He would be grateful for any references to citations or mentions of this collection in the literature. Since the collection is quite old, there is a possibility that it may contain some holotypes or paratypes and he would be especially grateful for such references. His address is: Prof. Enrico Bombieri, Istituto Matematico, Università di Pisa, 56100, Pisa, Italy.

ANY OFFERS PLEASE?

I would like to obtain, in good condition, a copy of H. E. Quick's "British Slugs", Bull. Brit. Mus. (N.H.), 6 (3), (1960). Mr. A. D. Court, [REDACTED], Rowley Regis, Warley, Worcestershire, [REDACTED]

SHELLS FOR SALE

Browse in baskets full of shells from all parts of the world - at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (01-437 9391)

FIELD MEETING NOTICE

Marine dredging trip from Bridlington, Yorkshire, on Saturday 13th. October 1974.

Limited to 12 (Members only).

Book with Mr. A. Norris, City Museum, Municipal Buildings, Leeds, LS1 3AA

Members must make their own transport and accommodation arrangements.

T. Pain,
Field Meetings Organiser.

EXCHANGE WANTED

I have a complete set of The Nautilus (the first two "volumes" of the forerunner, the Conchologist's Exchange are in xerox), but Vols. 3 (1889) to 55 (1942) are bound, and Vols. 56-88 are in issues. There are 3 indices. I would like to exchange it for a complete set of the Proceedings of the Malacological Society of London. Anyone interested, please write: Dr. R. T. Abbott, Delaware Museum of Natural History, Box 3937, Greenville, DE.19807 U.S.A.

GLASS-TOPPED BOXES - a good range of sizes and depths available from D. B. Janson, 44 Great Russell Street, London, WC1B 3PA; reasonable prices from 25p each (3 $\frac{7}{8}$ " x 2 $\frac{7}{8}$ " x 1 $\frac{3}{4}$ " deep) up to 38p each (7 $\frac{3}{8}$ " x 5 $\frac{3}{8}$ " x 3 $\frac{1}{4}$ " deep).

Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

EXCELSIOR: THE SNAIL ASCENDING

"The slowe snaile clymeth the tower at last, though the swift swallow mount it sooner." John Lyly, Euphues (1580).

The proclivity of snails for climbing is well known and had evidently been observed at least 400 years ago. What induces them to go aloft? It cannot be to admire the view, for they are too short-sighted. It may be to avoid being flooded out and drowned, or to escape being stood on:

An inadvertent step may crush the snail
That crawls at ev'ning in the public path;
But he that has humanity, forewarn'd,
Will tread aside, and let the reptile live.
William Cowper, The Task.

It has been suggested that snails climb to seek cooler air away from the heated ground, to graze on cryptogamic plants which grow on tree-trunks, rocks and walls, or to take refuge from predators or uncongenial associates: "How ingenious an animal is the snail. When it encounters a bad neighbor it takes up its house and moves away" (Philemon, Greek comic poet, c.300 B.C.: The Macmillan Book of Proverbs....New York, 1947). It may possibly be to surmount an obstacle in their path, being too dim-witted to circumvent it, or simply, as Mallory said of Mt. Everest, 'because it's there'.

To Lyly the snail symbolised dogged perseverance, though its futile enterprise might equally well be ascribed to stubborn stupidity. The concept of the snail's laboriously deliberate ascent of the tower, in contrast with the swallow's effortless celerity, was presumably proverbial, having obvious affinity to Aesop's hare and tortoise; it recurs several times in the literature of the next 150 years.

"Can the sluggish snayle with creeping pace euer reache the castles tower?" Brian Melbancke, "Philotimus. The Warre betwixt Nature and Fortune" (1583).

"At length the snaile doth clime the highest tops,/ Ascending up the stately castle walls." Locrine, act 2, scene 1 (1595).

"The Snail slides up the Tower at last, though the Swallow mounteth it sooner." Thomas Fuller, "Gnomologia: Adagies, Proverbs, Wise Sentiments, and Witty Sayings, Ancient and Modern, Foreign and British" (1732).

"House-snails.--for albeit the Snaile goeth most slowly, yet in time, by her constancie in her course, she ascendeth the top of the highest Tower, as that most worthy and learned gentleman Master Carew of Antony hath wittily moralised in his poeme intituled, the hearings taile." John Guillim, "Display of Heraldry" (1610). The work referred to is "A Herrings Tayle: Containing a Poeticall fiction of divers matters worthie the reading" (1598), which was re-issued, with modernised spelling and abbreviated by almost a quarter of its length, in F.E.Halliday's "Richard Carew of Antony. The Survey of Cornwall &c." (Andrew Melrose, 1953). This shortened version occupies 698 lines! The following is the opening couplet:

I sing the strange adventures of the hardie Snayle,
Who durst (unlikely match) the weathercock assayle.

I am indebted to Mrs. Stella Turk for telling me about this book.

'The splendour falls on castle walls'
While up the rugged ramparts crawls
The sluggish snail, all unaware
Of swallows in the high clear air
Wheeling around the lofty vane
Which he may reach with toil and pain.
What blest nirvana does he seek,
Thus aiming for the topmost peak?
The slow-paced creeper, like the flier,
Aspires to travel ever higher.
Will life's long labour then have bought
A golden guerdon--or just nought?

A. E. Ellis

COLLECTING RARE MOLLUSCS OR WHAT MAKES MOLLUSCS RARE

At the end of each year I take the time to look at my present collection of British Molluscs and speculate as to the species that I might hope to add in the future. On this occasion I was struck by the fact that the major gaps in my collection as far as Scottish Molluscs were concerned were species which are supposedly rare. This led me to look closely at my present collection to see how many of these were rare, and how and where they had been collected.

In all I have in 8 years of mollusc collecting acquired 18 species which according to McMillan (1968) are rare, most of which have been collected in the last 3 years. These are given in the following list along with some particulars on method and place of collection.

1. Lepeta caeca - S.W. of Barra Head (Outer Hebrides) from a 15 minute haul with a plankton net, which had touched the bottom.
2. Cingula proxima - with above.
3. Cingula vitrea - " "
4. Alvania cimicoides " "
5. Alvania jeffreysi " "
6. Clathrus trevelyanus - from a trawl haul of 1 hour duration to the west of Orkney, census area 2.
7. Balcis anceps - South of Arran, Clyde - from a plankton haul which had touched the bottom.
8. Amauropsis islandica - From trawl hauls in the North Minch and in the Moray Firth.
9. Velutina plicitalis - from trawl hauls to the west of Orkney, census area 2. (One dead specimen at Aberdeen.)
10. Volutopsius norwegicus - from trawl hauls to the west of Orkney, adults, juveniles in egg cases from the Northern North Sea.
11. Buccinum humphreysianum - from trawl haul in the Minch.
12. Troschelia berniciensis - dead specimens in a trawl haul from west of Orkney.
13. Thesbia nana - from a trawl haul to the west of Orkney.
14. Menestho clavula - with Balcis anceps.
15. Arca pectunculoides - with Lepeta caeca.
16. Lima sulcata - with above.
17. Thyasira ferruginea - taken with a grab from Loch Sheildaig.
18. Cuspidaria rostrata - S.W. of Barra Head with Lepeta caeca.

In most of the above cases only 1 or 2 specimens were obtained but Arca pectunculoides and Velutina plicitalis were both fairly common on the occasions they were collected.

Looking at the list and that of other rare species it would appear that they can be divided into two groups.

- 1) Those species whose distributions lie in the less accessible areas of the British Isles, i.e. offshore to the North and West of Scotland, West of Ireland and S.W. of the Scilly Isles.
- 2) Small species whose centre of distribution is sublittoral, e.g. species

belonging to the Rissoidae and Pyramidellidae among the Gastropods and the Thyasiridae among the Lamellibranchs.

To collect species in category 1, conchologists must have the opportunities to collect in the above-mentioned areas or they will never obtain these rare species. However an increase in the collecting effort in these areas might remove many of these species from the rare list.

Rare species in category 2 are probably more accessible, as a change in the sublittoral collecting methods, even in fairly frequently visited areas, might provide a number of species listed as rare.

In summary I conclude that I have collected these species because I have been fortunate enough to visit the right areas and used, even if by accident, methods likely to capture, and that the rare connotation given to some species may be more applicable to the conchologists than to the molluscs.

Reference: McMillan, N.F., (1968) "British Shells", London, Frederick Warne & Co. Ltd.

David W. McKay

REPORT OF COLLOQUIUM ON MOLLUSCAN PHYLOGENY

Held at Bedford College, London, 3-4 April 1974
Organised by J.D. Taylor and N.J. Morris (BMNH)

Originally planned as an informal 'workshop' the meeting necessarily took on more formal lines in order to accommodate the many people who wished to contribute. There was a strong international 'flavour' to the meeting with over 100 participants from twelve countries. Interests ranged widely through many aspects of biology, ecology and palaeontology and the programme was designed to examine the evolutionary history of each molluscan group through the eyes of both Recent and fossil workers.

The first session was devoted to a discussion on the radiation of the molluscan classes. Both M. Edmunds (Accra) and E.R. Trueman (Manchester) discussed the early development of molluscs from a primitive turbellarian-like ancestor. Edmunds gave a functional interpretation for the origin of a shell, the evolution of pedal locomotion and the development of segmentation in chitons and Neopilina, while Trueman examined the diversity of locomotory methods seen in living molluscs and suggested how they may have arisen from the turbellarian ancestor. The evolution of mantle cavities in the Conchifera was discussed by A. Graham (Reading). N. J. Morris (BMNH) outlined some of the fossil evidence for the origins of the molluscan classes showing how the functional radiation examined by the zoologists could be seen in early Palaeozoic shells. L. V. Salvini-Plawen (Vienna) discussed some aspects of his very detailed study of the so-called 'Aplacophora'. It seems from his work that the Caudofoveata and Solenogastres should be regarded as the most primitive extant molluscs and that together with the chitons they have been distinct from the main molluscan stock (the Conchifera) from an early time. W. Haas (Bonn) illustrated the similarity of spicule formation between the chitons and the Aplacophora. An elegant electron microscope study of molluscan sperm by W. L. Maxwell (Bristol) showed the potential of new characters in phylogenetic studies. A. E. Fritsche (California) dealt with the problems of nomenclature when related to phylogeny at species level.

In the following session C.F.E. Roper (Smithsonian) showed how it was virtually impossible to classify the Recent cephalopods using only 'hard parts'. J.Z. Young (London) discussed aspects of the high level of nervous system organisation in cephalopods, a point further developed in an evening session by A. Packard (Edinburgh) who wondered whether palaeontologists could profit from considering aspects of behaviour and psychology more closely. The summary given by M. R. Clarke (Plymouth) on the biology and behaviour of Spirula contained many useful facts for the functional interpretation of cephalopod shells. D. T. Donovan (London) examined patterns of cephalopod diversity through time and related them to competition both within various

cephalopod groups and with the marine vertebrates. G. Westermann (McMaster) showed how biomechanical studies of fossil cephalopod shells can yield important information regarding their probable mode of life. For instance brevicones are restricted to shallow water whilst longicones can inhabit deep water. R. Cowan (California) continued the functional theme showing how an understanding of buoyancy control in Recent cephalopods could be used to interpret many of the morphological features of septal and siphuncular architecture in fossil forms.

Opening the session on gastropods V. Fretter (Reading) surveyed the major features of their classification, particularly within the Prosobranchs. Opisthobranchs and Pulmonates most probably arose from a Rissoacean type ancestor. A. Graham attributed the extensive radiation of the gastropods to the evolution of a wide range of feeding techniques, with the radula in particular undergoing many modifications. N. J. Morris surveyed the range of Caenogastropod families and suggested possible interrelationships based on fossil evidence. A point of particular interest is the apparently synchronous development of the predatory habit in at least three superfamilies by the late Lower Cretaceous. R. Linsley (Hamilton) proposed a tentative regrouping of Palaeozoic archaeogastropods. Along with several other workers he stressed the difficulties of interpreting the Bellerophonids and the early limpet-shaped forms. E. Yochelson (Washington) surveyed the rather scanty fossil evidence for Opisthobranch and Pulmonate ancestors. It seems that the earliest Opisthobranch is *Tournasian* whilst *Dendropupa*, the first Pulmonate, is of Upper Carboniferous age. Solem has recently suggested that the latter be classified within the Pupillacea.

J. Rosewater (Smithsonian) discussed relationships within the Littorinidae and outlined a phylogeny from marine to land forms. The Littorinidae were again mentioned by K. Bandel (Bonn) who illustrated the morphological diversity of their radulae. R. Batten (New York) suggested, on the basis of shell structure studies, that within the Zeugobranchia the Scissurellids showed closer affinity to the Fissurellids than to the Pleurotamariacea and should accordingly be re-classified.

V. Fretter discussed reproductive strategies in marine gastropods mentioning the different functions of the egg, trochophore, and veliger stages as related to survival and dispersal. K. Bandel presented the results of his detailed electron microscope study of embryonic Caribbean gastropod shells and pointed out that these could be a useful new character of phylogenetic and palaeoecologic studies. J. F. Peake suggested that egg-laying strategies of land snails were directly related to the stability of the environment.

C. M. Yonge (Edinburgh) initiated the Bivalve session with a review of the biology of some of the main groups, drawing on his extensive experience gained in over fifty years of active research. T. Waller showed how recent advances in shell structure studies have led to a more satisfactory phylogeny for the Pteriomorpha. R.D.K. Thomas (Tubingen) showed how the diversity of shell form among the arcoids reflected a radiation into many different life habits but it seems that a mechanical constraint on their ligament system has prevented them from ever becoming deep burrowers.

J. S. Levinton (New York) examined some aspects of bivalve evolutionary ecology. He suggested that communities dominated by deposit feeders would be more stable through time than those dominated by suspension feeders. Deposit feeding genera appear to have longer geological ranges.

Obviously it was not possible to do anything like full justice to such a broad subject in only two days, but nevertheless, both in the talks and the ensuing discussions ideas and opinions were freely exchanged and many valuable new approaches and research techniques were expounded. There would still seem to be much scope for work on the very earliest fossil molluscs and many exciting discoveries are surely yet to be made. How many more forms such as the recently described *Knightoconus* (linking the monoplacophorans with the cephalopods) await to be found in our Palaeozoic rocks? Functional morphological studies, and one thinks in particular of the excellent talk given by Cowan, can greatly increase our knowledge of the life habits of fossil molluscs. In particular there are many gastropod shell forms and structures that await interpretation. Palaeoecologists too have much to contribute to

our knowledge of molluscan phylogeny, the analysis of cephalopod diversity patterns by Donovan could very profitably be expanded and extended to other groups. The evolutionary significance of feeding strategies as demonstrated by Levinton could be profitably extended to other trophic groups particularly in the gastropods.

J. A. Crame, King's College, London

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PINNA IN SHETLAND AND OFF ABERDEENSHIRE

Records of Pinna (P. (Atrina) pectinata L.) in the far north of the British Isles are rare (see Rendall 1956 and Heppell 1973 for Orkney records), so I am pleased to add to their number. When in Shetland in 1972 I was shown two fine live-taken specimens, one of which (285 x 150mm) is now in Liverpool Museums. These were obtained in spring, 1972, in Yell Sound on a sandy bottom in about 60 fathoms. I also saw two good-sized valves which had been brought in from deep water; they were old and encrusted on both sides with worm-tubes.

The species was recorded from Shetland by Edward Forbes (Forbes & Hanley, 1853, p. 259): "Zetlands, deep water (E.F.)." Jeffreys (1863) gave an account of earlier explorations of Shetland waters from those of Dr. Fleming (when minister of Bressay) to Forbes. In later years Jeffreys himself dredged extensively in the area, yet nowhere does he mention Pinna, except that in his 1868 Report it is included without comment in the list of Shetland Mollusca. Jeffreys confined his dredging in Shetland waters almost entirely to the eastern side of the islands, and went as far as fifty miles from land. Thus, though both Jeffreys and his friend Barlee made their headquarters in different years on the islands of Whalsay and Out Skerries, it seems that they did not do any dredging nearby, which probably explains why they did not find Pinna.

The area where Pinna occurs is that in which the extraordinary concretions described and figured by Sabine (1970) are found. Rendall (1956) mentions that the species "has been taken on several occasions from deep water in Shetland" but gives no more details. Jeffreys (1862, p. 371) also records "Pinna pectinata brought up on a fisherman's line 30 miles from land" (i.e. from N.E. Aberdeenshire, N.F.McM.).

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N. F. McMillan

INTERTIDAL MOLLUSCS OF LADRAM BAY

The following notes on Ladram Bay in south Devonshire were made on some pleasant sunny March days. Ladram Bay is backed by cliffs of red Triassic sandstone, and the harder bands of this rock also form reefs on the foreshore.

Rock pools are present and there is a pebble beach, with some areas of rock rubble amongst the boulders near the cliff. The degree of exposure to wave action is moderate, and a major factor influencing the fauna is the soft nature of the sandstone substrate.

Most work was done at the point separating Ladram Bay from Chislebury Bay. Here the upper limit of barnacles comes a metre or two up the cliff. Above this, in the littoral fringe, is a distinctive band of green algae and Littorina neritoides and L. saxatilis occur in the pock-marked rock.

Below, in the littoral zone, the area consists of a diversity of rock surfaces, rock pools and rock rubble. The whole area is inhabited by the common intertidal prosobranchs of S.W. England including three patellids (Patella vulgata, with P. aspersa and P. intermedia common at the point), two trochids (Gibbula umbilicalis and Monodonta lineata), two littorinids (Littorina littorea and L. littoralis) and the carnivorous Nucella lapillus (Thaididae). Amongst rock rubble were to be found prettily banded chocolate and white individuals of Cingula cingillus. A feature of the rock pools was the large quantity of the green finger-like alga Codium, supporting a population of the sacoglossan Elysia viridis with its clown-like white eye patches and tasteful blue speckling. Living amongst the other algae were the rissoids Rissoa guerini, R. parva, Cingula semicostata and Cingula semistriata. Under stones in the rock pools were the chitons Lepidochitona cinerea and Acanthochiton crinitus. Single specimens of Skenea serpuloides and Mangelia coarctata came from these rock pools, discovered on my fingers! Bulk samples of gravel yielded no more.

The sandstone rock was the home of a limited number of bivalves. Mytilus edulis was represented only by numerous juveniles on some of the rock surfaces. Suitable portions of the sandstone were riddled with the borings of Pholas dactylus and Hiatella arctica. Nestling in the pholad holes were Venerupis saxatilis and Kellia suborbicularis.

In the sublittoral fringe, accessible only for limited periods, is to be found a further set of species. This zone is marked by the forest-like growth of Laminaria and the masses of encrusting colonial sponges and tunicates. Common species found here included Callochiton achatinus, Patina pellucida living on Laminaria stipes, two trochids (Calliostoma zizyphinum and Gibbula cineraria), the small Trivia species feeding on tunicates and the neogastropods Ocenebra erinacea and Nassarius incrassatus. The specimens of Trivia ranged from darkly spotted forms (T. monacha), through pale spotted forms, to unspotted (T. arctica). [Apart from differences in pigmentation, Lebour (1933) demonstrated differences in the radulae and larvae of the two species, but the problem might bear further examination.] The undersurfaces of rocks were in places encrusted with a saddle oyster (Heteranomia squamula). A solitary large specimen of the introduced Crepidula fornicata was also found. Other less common animals encountered at low tide were Lacuna parva on Laminaria, Odostomia plicata and O. unidentata on the polychaete Pomatoceros and a single Turbonilla elegantissima. The pleurobranchid Berthella plumula occurred beneath stones, looking at first sight like a yellow blob of jelly.

No doubt other species come and go with the seasons by exchange with deeper water.

10 May 1974, M. J. Bishop

A BRIEF SURVEY OF THE LAND AND FRESHWATER

MOLLUSCA OF GAIRLOCH, WESTER ROSS (V.C.105)

The Gairloch area of Wester Ross has a mixed geology of Pre-Cambrian and Torridonian rocks. In general the area does not afford a rich molluscan fauna and the regions richest in molluscs are the coastal zones followed by forestry areas and finally inland cultivated valleys. The survey, carried out in the first two weeks of July 1973, was hampered by heavy rain and flooding. This severely restricted fresh water searches and that accounts for the lack of

many common freshwater molluscs in the list which follows. In all six 10Km. squares (NG18/76, NG18/77, NG18/78, NG18/87, NG18/88 and NG18/97). Not all suitable areas were surveyed but a general coverage of all six squares was obtained. Seven species were authenticated by Dr. M. P. Kerney as new records for V.C.105, while a few unconfirmed records were verified. The list consists of 45 species, perhaps not as many as one would like but if the list acts as a guide to future workers in the area then the compilation will not have been wasted.

Cochlicella acuta and Helicella itala were two species noticeably missing in this area even though extensive sand dune system surveys were carried out.

<u>Potamopyrgus jenkinsi</u> (Smith)	Only found in one stagnant pool by the Gairloch cemetery.
<u>Carychium minimum</u> Muller	On the wooded banks of the River Ewe just above the road bridge.
<u>Lymnaea truncatula</u> (Muller)	In the Strath Burn, Gairloch specimens very small.
<u>Lymnaea peregra</u> (Muller)	Widespread in most lochs, rivers, etc..
<u>Cochlicopa lubrica</u> (Muller)	Coastal regions, sandhills and woods (Flowerdale Woods, Kerry Woods, Redpoint Sands, Gairloch sandhills, and Little Sand)
<u>Cochlicopa lubricella</u> (Siemaschko)	Similar localities as <u>C. lubrica</u> but in slightly drier habitats.
<u>Lauria cylindracea</u> (da Costa)	Common in all coastal areas.
var. <u>anconostoma</u> Lowe	also present
<u>Vallonia costata</u> (Muller)	Found only on the coastal sandhills of Gairloch Golf Course (NG18/805754) and appears to be quite rare. A new V.C. record.
<u>Vallonia excentrica</u> Sterki	Common on all coastal sand soil areas. (Melvaig Gairloch and Little Sand). A new V.C. record.
<u>Clausilia bidentata</u> (Ström)	Large colonies in and around Gairloch cemetery.
<u>Balea perversa</u> (L.)	Found on beech trees in the Flowerdale Woods.
<u>Arianta arbustorum</u> (L.)	Quite common at Gairloch Sandhills and on the banks of River Ewe at Poolewe.
<u>Cepea hortensis</u> (Muller)	Common in coastal areas. Massive predation occurs at Redpoint Sands, probably due to migrational thrushes.
<u>Helix aspersa</u> Muller	An apparently recent introduction, extensive colonies in dykes and under stones at Strath seafront (NG18/795773). A new V.C. record.
<u>Acanthinula aculeata</u> (Muller)	Sieved from beech leaves at Flowerdale Woods.
<u>Acanthinula lamelata</u> (Jeffreys)	Sieved at the same locality as <u>A. aculeata</u> , confirming an old record for this area.
<u>Hygromia striolata</u> (C. Pfeiffer)	New V.C. record. Common in coastal areas such as Gairloch (NG18/806756), Strath and Poolewe.
<u>Helicella caperata</u> (Montagu)	New V.C. record. Common on the Gairloch Golf Course (NG18/806756) and Strath seafront.
<u>Discus rotundatus</u> (Muller)	Common in most coastal areas in and around human habitats.
<u>Arion intermedius</u> Normand	Very common in all localities.
<u>Arion circumscriptus circumscriptus</u> Johnston	Quite common in all areas but has to be looked for!
<u>Arion fasciatus</u> Nilsson	Only found under stones at Gairloch cemetery.
<u>Arion hortensis</u> Férussac	Least found of all <u>Arion</u> species, and mainly in agricultural habitats.
<u>Arion subfuscus</u> (Draparnaud)	Very common in all habitats, even remote peat bogs.
<u>Arion ater</u> agg. L.	Commonest <u>Arion</u> species present.
True <u>Arion ater</u> in and around hill	lochs, large brown form in gardens, etc..

<u>Euconulus fulvus</u> (Müller)	Common in Flowerdale Woods. Typical habitat leaf litter and under logs.
<u>Vitrea crystallina</u> (Müller)	Only found in sandy soil at the mouth of Melvaig Burn.
<u>Vitrea contracta</u> (Westerlund)	Common in all coastal and wooded areas.
<u>Oxychilus alliarius</u> (Miller)	Common in most areas, very small compared to north east Scottish forms.
<u>Oxychilus cellarius</u> (Müller)	Very large specimens to be found in all wooded and coastal areas. Unusual dark form found, typical of Irish forms according to Dr. Kerney.
<u>Retinella radiatula</u> (Alder)	Common in all coastal sandy areas.
<u>Retinella pura</u> (Alder)	Common in wooded and sandy areas.
<u>Retinella nitidula</u> (Müller)	Common in cultivated areas and rubbish tips at Strath seafront.
<u>Vitrina pellucida</u> (Müller)	Ubiquitous in all squares.
<u>Milax gagates</u> (Drap.)	A new V.C. record, confirming an old doubtful record. Only found under stones at Strath seafront (NG18/799772).
<u>Limax cinereoniger</u> Wolf	Common in the pine woods of Flowerdale and Kerry.
<u>Limax maximus</u> L.	Common in wooded coastal and inland areas; several varieties present.
<u>Limax marginatus</u> Müller	Ubiquitous in all areas, even on remote rocky outcrops in peat bogs.
<u>Agriolimax reticulatus</u> (Müller)	Common in all areas. A small white form which may be <u>Agriolimax agrestis</u> (L.) can be found in very damp areas of the Kerry Woods.
<u>Agriolimax laevis</u> (Müller)	Not uncommon in all localities, but must be looked for.
<u>Margaritifera margaritifera</u> (L.)	Located in the Kerry River in large numbers.
<u>Pisidium casertanum</u> (Poli)	Not uncommon; Strath Burn and Loch Feur.
<u>Pisidium milium</u> Held	New V.C. record. Not uncommon in Strath Burn and Loch Feur.
<u>Pisidium lilljeborgii</u> Clessin	Loch Feur, taken on hard non sand bottom. Similar to some other northern Scottish Lochs (although the species is commonly attributed to sandy-bottomed lochs).
<u>Pisidium hibernicum</u> Westerlund	Loch Feur, in company with <u>P. casertanum</u> and <u>P. lilljeborgii</u> .

July 1973, R. G. Meiklejohn

PHYTIA MYOSOTIS (DRAPARNAUD) IN SUTHERLAND EAST (V.C.107)

During a visit to the Dornoch Links on the 30th. July 1974 Phytia myosotis, the primitive pulmonate snail, was encountered in considerable numbers, a new record for V.C. 107. This species has been poorly recorded in Scotland to date, perhaps because it has not been properly looked for.

From north to south the Dornoch Links consist of flat sandy grassland changing to brackish marsh and finally to mudflat. On the east they are sheltered by the dunes of Dornoch sandhills, while in the west they change to arable land before fading into the wooded hills of Clashmore. These links are subject to seasonal flooding, and during these high tides seaweed is stranded on the brackish marsh area. This stranding takes the form of clumps of Bladderwrack (Fucus) and Eel grass (Zostera) which are trapped by the brackish grass as the tides recede.

These clumps dry out on the top while underneath they remain humid and wet, and it is here that P. myosotis was found to congregate. One might have thought this a very suitable niche for propagation in this species, but during this visit breeding and egg laying were not seen, and the snails apparently congregated exclusively to feed on the Zostera spp.

Outside this niche P. myosotis could be found sparingly at the roots of

certain brackish plants and also under driftwood, but then only within a 25-30 metre band which extended the length of the strand area some one to two kilometres. Outside this band both landward and seaward suitable clumps of seaweed could be located but P. myosotis was not evident. It therefore appeared that P. myosotis was restricted in habitat, but what controlled this restriction was uncertain - perhaps salinity, or the species is gregarious within strand lines following food sources. Future research into the life history of this snail is needed before any conclusions can be reached on the reasons for the habitat.

Further sites for P. myosotis will probably be found in Scotland once the typical habitat has been examined by fieldworkers. Finally I wish to thank Dr. M. P. Kerney for his determination of this species, also his continued help with the Land Mollusca of northern Scotland.

R. G. Meiklejohn

UNITAS MALACOLOGICA EUROPAEA

Project for mapping the non-marine Mollusca of Europe.

In recent years malacologists have shown much interest in studies of geographical distribution. During the Fourth European Malacological Congress at Geneva (1971) a committee was formed to consider how the work in progress in a number of European countries might be co-ordinated, ultimately leading to the production of species maps for the whole of Europe. The present members of the committee are H. Ant (German Federal Republic), H. Chevallier (France), E. Gittenberger (Netherlands), M. P. Kerney (Great Britain), H. W. Waldén (Sweden) and J. Heath (Great Britain, co-opted).

We believe that such an aim is now possible, using the common cartographic methods employed in the Flora Europaea mapping project, and also recommended by the committee of the European Invertebrate Survey. We recognise that for many groups of molluscs the compilation of both national and international maps is hindered by serious taxonomic problems; nevertheless, we believe that the solution of these problems is likely to be stimulated by the mapping project. Dr. Waldén has undertaken to compile a check-list of western Palaearctic terrestrial species, and would be pleased to receive help and advice in this work from specialists in different groups, or from those with expert regional knowledge.

We therefore recommend:

1. The adoption of the 50-kilometre squares of the UTM (Universal Transverse Mercator) grid as the basic units for the eventual production of unified European species maps. The presence of each species will be shown by conventional symbols in the squares of the base map, as in the maps already published for the Flora Europaea atlas.
2. The immediate setting-up of national mapping schemes, preferably using the UTM grid. For small or medium-sized countries the 10-kilometre square is suggested as a convenient unit of mapping; for large countries, mapping at a level of 25- or 50-kilometre squares is probably more realistic. A national atlas of species distribution should be the aim in all countries within a reasonable period of years.

These recommendations were accepted by the General Assembly of UME at the Fifth Congress in Milan in September 1974. Furthermore, the following list of provisional organisers for national mapping schemes was adopted:

- | | |
|---------|---|
| BELGIUM | Dr. J. van Goethem, Institut royal des Sciences naturelles de Belgique, rue Vautier 31, B-1040, Bruxelles, Belgium. |
| FINLAND | Dr. I. Valovirta, Zoological Museum, University of Helsinki, P. Rautatiekatu 13, Helsinki 10, Finland. |

FRANCE Dr. H. Chevallier, Muséum National d'Histoire Naturelle, 55 rue de Buffon, 75-Paris (5^e), France.

GERMAN FEDERAL REPUBLIC Prof. H. Ant, [REDACTED], 47 Hamm, Westf., German Federal Republic.

GREAT BRITAIN, IRELAND Dr. M. P. Kerney, Department of Geology, Imperial College, London, SW7 2BP, Great Britain.

HUNGARY Mr. L. Pinter, [REDACTED], H-1024 Budapest, Hungary.

ITALY Dr. F. Giusti, Istituto di Zoologia, Via Mattioli 4, 53100 Siena, Italy.

NETHERLANDS Dr. W. Backhuys, [REDACTED], Rotterdam 3016, Netherlands.

NORWAY Dr. J. Økland, Department of Limnology, University of Oslo, Blindern, Oslo 3, Norway (freshwater Mollusca only).

SPAIN Dr. C. Rodriguez Babio, Departamento de Zoologia, Facultad de Ciencias, Santiago de Compostela, Spain.

SWEDEN, NORWAY, DENMARK, ICELAND Dr. H. W. Waldén, Naturhistoriska Museet, S-40030, Goteborg 11, Sweden (terrestrial Mollusca only).

Anyone interested in giving help in these countries should write directly to the appropriate national organiser; other enquiries should be sent to Dr. M. P. Kerney, Department of Geology, Imperial College, London, SW7 2BP, Great Britain.

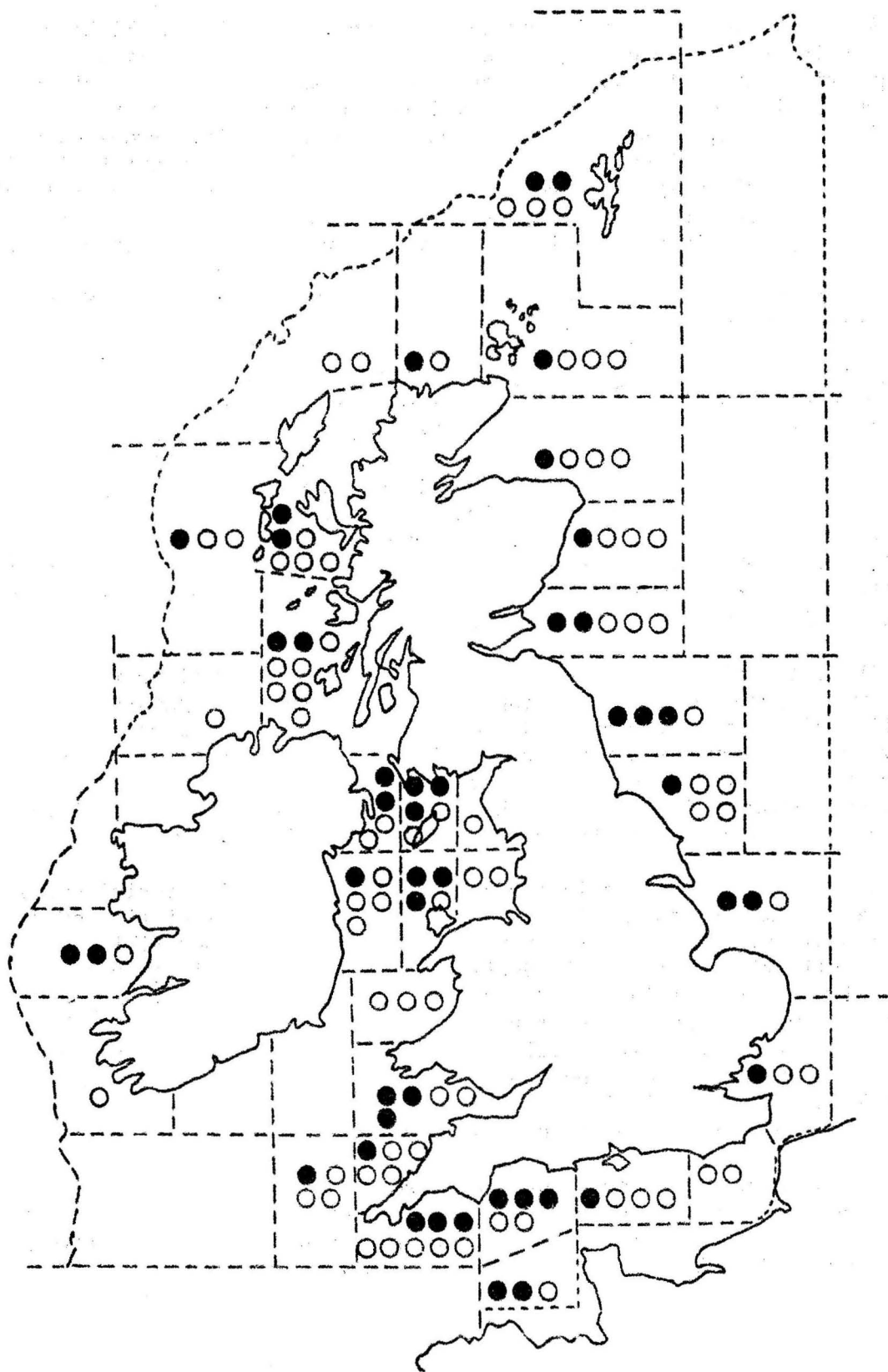
EIGHTH PROGRESS REPORT ON MARINE CENSUS WORK

The sixth and seventh Progress Reports (for 1972 and 1973) show how much the Marine Census leapt forward during that period. I cannot present a similar sort of report full of new plans and actions. Now the time has come for consolidation of the work Mrs. Turk has initiated. Also, as shown by the lateness of this essay, I am still 'playing myself in' and people have been kind enough not to inundate me with organisation jobs. As the emphasis is now on consolidation, in this Report I wish to show what has been happening in Marine Recording in a manner complementary to next year's Annual Report, and to show how recording has changed and in which way it now seems to be going.

The recording by Sea Area, as shown on the accompanying map, reveals a healthy situation. While some Areas, chiefly for historical reasons, have received more attention than others, the present recording effort is spread right across the British Marine area. This bodes well for obtaining information on the real distribution of species rather than on that of recording interest. Recording of littoral and adjacent habitats by 10km. square is progressing as smoothly as ever, but is not yet sufficiently advanced for a map on the lines of the non-marine maps to be meaningful.

The nature of recording has changed with the years. The backbone, as ever, is composed of the work of private individuals, as a major part of their holidays and days out, and one hopes that the economic climate will not unduly curtail this valuable activity. Sea Areas which show a great many circles on the map are those which have received the attention of the conchological giants of the 19th. and early 20th. centuries. This golden age of conchology gave way to the Marine Laboratory era, when considerable work was done by the laboratories when they were discovering What? and Where? before improved physiological and biochemical techniques enabled them to discuss How? and Why?.

Within the last 10 years or so marine recording has evolved considerably as the need for greater precision became more pressing. Records with the information "Widespread throughout the area" or "Rare" are no longer adequate, and as the direct result of education through the Marine Census scheme detailed records from a large number of localities are now coming forward. The flowering of this is the 10km. recording scheme and the more detailed documentation



Map of the British Marine Census Areas (Conchological Society, 1972) showing the numbers of molluscan species recorded in each Sea Area to 31.8.1974.

Each circle represents 60 species: solid circles = living post-1950 species (A status); open circles = shells and worn shells post-1950 (status B & C) plus all pre-1950 records.

Note that lists from some Areas have not yet been compiled fully, and that those from the off-shore Areas have been deliberately omitted.

of particularly interesting occurrences of species on Individual Record Cards.

A further development is now taking place. Even in the light of the upsurge in interest in recording, basic lists are often woefully inadequate, and the question "How will such and such a construction project affect the ecology?" is embarrassing because for most localities not enough is known to begin with. To this end, work, as the Marine Recorder is aware of it, organised as yet largely on a professional or combined professional and amateur basis, is being directed at noticeably under-recorded (for all phyla) areas and/or localities at hazard. Such schemes include Project Countdown aimed at a coastwide investigation of Laminaria as a habitat by skin divers at predetermined depths: a survey of Shetland (before the oil arrives) has been organised by the Institute of Terrestrial Ecology (erstwhile the Nature Conservancy) part of the National Environment Research Council. C.A.1, more or less neglected for very many years, has been the subject of a great deal of work by Mr. N. A. Holme and Dr. J. Darlington and her team. They have visited many localities in Shetland, paying particular attention to the littoral zone and laminaria holdfasts at 5m, with further loci at 10m. and the bottom. Not only molluscs were surveyed, but the molluscs found during this investigation, some 500 lots, have been presented to the Royal Scottish Museum in Edinburgh and are available for study. While the bulk of the work was designed to show which species are common and suitable for monitoring purposes, some rare or unexpected species have been found. Although their presence does not help the ecological value of the survey they are very valuable to the Marine Census as they considerably extend the known British range of such species.

The value of detailed recording has been made very clear this year when there was a proposed major development at Portland and Weymouth (C.A.16). This locality of great historical and present conchological importance was fortunately so well documented that Mr. Dennis Seaward was able to prepare a reasoned report to aid opposers of the project. It was a delight and a relief that there was enough evidence for such a report (and even greater relief when the project was abandoned and the report was not required).

A conference on biological recording in Scotland is provisionally planned for next April, and the Marine Recorder will be a representative of the Conchological Society. Most aspects of recording to be discussed will have a much wider application than just to Scotland and will result in a great deal of consolidation of present ideas and pave the way for the future. Amongst other things the role of natural history societies and individuals and the best ways in which they can be helped will be considered. I have been invited to present a report on the state of conchological recording particularly in Scotland and any help Area Representatives can give me in providing up to date information in the form of Census Area reports will be most welcome.

Although time is short, reports, however brief, from all Area Representatives (deadline early January) from which I can select information for the Marine Recorder's Annual Report would help to make the Report a lively community effort reflecting the work of many people.

Shelagh Smith

GENERAL NOTES

A guide to the natural history manuscript resources of the British Isles is being prepared by Gavin Bridson (Librarian, Linnean Society of London, Burlington House, Piccadilly, London, W1V 0LQ) and Anthony P. Harvey (Librarian, Department of Palaeontology, British Museum (Natural History), Cromwell Road, London, SW7 5BD). Relevant libraries, museums and other organisations are being surveyed by means of questionnaire. A particular problem of this survey is the wide scatter of material as shown by its presence in some unlikely locations and many individuals will, through their own researches, have come into contact with such items. They may also know of undocumented items in public and private collections and might be able to contribute valuable information. The compilers will be grateful for, and readily acknowledge, any such information. The results of this survey are to be published by the Bowker Publishing Co. Ltd. in 1975.

ANNUAL SUBSCRIPTIONS AND COVENANTS

Dear Members,

The Annual Subscription for the coming year will be due on 1st. January, 1975. Will you all please try to remember this and to send them in without further reminder; the cost of posting reminders can be quite heavy. Furthermore the Society, taking into account the present high cost of printing, postage, etc., has reluctantly been compelled to enforce the rule that publications will not be sent to Members whose current subscriptions are unpaid. If paid later we shall, of course, arrange for the despatch of any publications which have been withheld, but frequent amendments to the mailing-lists entail considerable amounts of extra work for your Secretary, Editor and Treasurer, so that we shall all be grateful if you will make a note to pay promptly.

Members' Subscription rates are as follows:

Ordinary Member:	£3.00 (U.S. \$9.00)
Family Membership:	£4.00 (U.S. \$12.00)
Junior Member:	50p

All ordinary Members receive copies of all publications; Junior Members receive the Conchologists' Newsletter and Papers for Students.

Cheques, etc. should be made payable to "The Conchological Society of Great Britain and Ireland" and sent to me. Banker's order forms are available, if desired.

Covenanted Members will no doubt be pleased to hear that in accordance with a new ruling of the Inland Revenue Department I have obtained permission to dispense with the use of Form R185 which you have previously been obliged to sign each year. There is one exception to this ruling, as the form must be signed for the first year of any new covenant.

I hope that more Members will consider payment of subscriptions under Seven Year Covenant. This involves no extra expense to the Member, but the Society is entitled to reclaim the appropriate amount of Income Tax from the Inland Revenue Dept. and this provides a useful addition to our funds. I shall be pleased to supply a form of covenant and explanatory letter to any Member who would like to think about this method of payment.

Yours sincerely,

MARJORIE FOGAN (Hon. Treasurer)

[REDACTED], Atherton, Manchester, [REDACTED]

JOURNAL OF CONCHOLOGY - BACK NUMBERS

The Society would like to buy a few copies of the Journal of Conchology, Vol.27, Parts 1, 3 and 4 only, and is prepared to pay £1 per part for these. Will any members who have these for disposal please forward to the Hon. Editor, Dr. C.R.C. Paul, Dept. of Geology, Liverpool University, Liverpool, L69 3BX, who will arrange for the Hon. Treasurer to send cheques in payment.

THE SOCIETY'S PUBLICATIONS

Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19 (Telephone 01-771 9719) at 25p each, incl. post, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, price 50p, and who will take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

WANTED

Frank Nolf, [REDACTED], B-8400 Oostende, Belgium, wishes to exchange shells and can offer many species from the North Sea, E. Atlantic Coast, Mediterranean, Canaries and N. Africa, live caught, precise details. Please send lists of British shells with full information.

WANTED

Octogenarian conchologist would appreciate the company of a fossil nautilus in recognisable condition. He would feel much younger with a 140 million-years-old companion. It would also be useful for demonstration at his talks on "Marine Mollusca". Information welcomed, with price, if possible.
Wilfrid M. Appleby, [REDACTED], Cheltenham, Gloucestershire, [REDACTED]

SHELLS FOR SALE

Browse in baskets full of shells from all parts of the world - at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (01-437 9391).

CONTRIBUTIONS FOR THE NEWSLETTER IN 1975

The Compiler will be very pleased to receive more articles, field meeting reports, notes and news items for publication in future issues. Diagrams, maps and drawings will be most welcome, providing that they are 'same size', clearly drawn in indian ink on white paper and avoid very fine lines and details. All such items should not exceed the type area (as distinct from the page area).

Because of the heavy cost of postage, no acknowledgments can be sent unless there is a specific query to be answered. It is, of course, much appreciated when a stamped addressed envelope is enclosed with any enquiry.

P.E.N.

CHRISTMAS 1974

The Compiler sends the Season's Greetings and Best Wishes for the New Year to every reader of the Newsletter.

BOOK REVIEW

There must be a number of readers of The Newsletter who, like myself, have experienced the enormous pleasure of being under water in the tropics, and who may not be able to indulge themselves again. I recently picked up a book which took me right back to a coral reef. I almost felt that I was back on the reef myself. Most of the book talks about fish, but there are a number of interesting references to molluscs. I strongly recommend it to anyone who longs to dive again, or for the first time for that matter, in the tropics. The book is "Something Rich and Strange" by Robert E. Schroeder, published by George Allen & Unwin Ltd., Ruskin House, Museum Street, London, in 1967.

Peter Pain, Peter Oliver

 Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

PLACE-NAMES WITH A MOLLUSCAN FLAVOUR

This singularly profitless investigation was triggered off by the remark of a correspondent that Musselburgh is the only British place-name based on a mollusc. Actually there are numerous place-names connected with Mollusca, while there are many more with a molluscan flavour but quite unrelated derivation. Moreover, Musselburgh is by no means the only name associated with *Mytilus*: Mussel Point, Zennor, and Mussel Rock, Bude, Cornwall; Musselwick Sands, Marloes, Pembrokeshire; Mussel House and Mussel Bank, Isle of Sheppey; Mussel Banks, Conway - though the last two, like Shell Flat and Oyster Grounds, near Fleetwood, are perhaps descriptive rather than bona fide place-names. Great and Little Mussels, Bowers Gifford, Essex, may be connected with Moushold Marsh (1569).

The most esculent of Mollusca has given its name to Oysterfleet, Canvey Island; Oystermouth, and White Oyster Ledge off Mumbles Head, Glamorgan; Oyster Ness, Humber; Oyster Haven, East Kinsale Harbour, Co. Cork; and Oyster Island in Sligo Bay (Sligo means 'abounding in shells'). Oyster Hill, Headley, Surrey, takes its name from an Eocene deposit. Most inland 'oyster' names are derived from Old English ewistre or ewestre, sheepfold (from Eowe, sheep or ewe): Oyster End, Little Hadham, Hertfordshire; Oyster Well ('sheepfold spring'), Bagendon, Glos; Oysters Farm, Semley, Wiltshire; Oyster Lane, Byfleet, Surrey; Oyster Bridge (Ewestrebregge, 1363), Great Bardfield, Essex. Osterley, Heston, was Oysterley in 1302.

Scallop or Clamshell Cave, Isle of Staffa, takes its name from another edible bivalve, but most 'clam' names can be derived from O.E. claeman, to smear, hence clayey, sticky land, or clam (whence 'clammy'), mud or clay: Clam Park, Staveley, Derbyshire; Clam Field, West Heath, Woolwich; Clampitt, Sandford, near Crediton, and at Christow, Devon, and Linkinhorne, Cornwall.

A few 'cockle' names may relate to *Cardium* (or *Cerastoderma*), such as Cockle Sand, Exmouth; Cockleshell Hard, Isle of Grain; Cockle Shoal, off Caister, Norfolk; Cockle Gat or Gatway, the northern entrance to Yarmouth Roads; and perhaps Cockleridge, Avon estuary, S. Devon. Cocklebury, Langley Burrell, Wiltshire, may owe its name to a misidentification of Oolitic brachiopods: according to Aubrey (p.9), "the rough stone about Chippenham (especially at Cockleborough) is full of petrified cockles." Most 'cockle' names are, however, homonyms, being variously derived from O.E. cocc (whence 'haycock'), heap, hillock and hyll or hlaew (whence 'law'), hill; cocc, cock bird or woodcock, and hyll; coccel, corncockle, darnel, tare; or from personal names, such as Cockle Farm, Welton, near Daventry (Cokes Mede, 1312), and Cockle Hill, Newton, near Cambridge (Cokereleslowe, 1293, the final syllable from hlaew). Cockle Pits, Brantingham, East Riding, may refer to heaps of stones from old quarries (Cockefeld, 1226). Cocklerue, Cockelroy or Cuckold-le-Roi, a hill near Linlithgow, may be from Gaelic cochull ruadh, red cap or hood. Other 'cockle' names are: Cockle, a stream - or burn - in Midlothian; Cockles and Cockle Park (Cockhill, 1314), near Morpeth; Cockle Sike (sic = a small stream), Dufton, near Appleby; Cocklethwaite, Shap Rural, Westmorland; Cockleberry, North Cowton, North Riding; Cocklepit Hole, Little Massingham, Norfolk; Cockle Close, Burton Lazars, near Melton Mowbray; Cockleford, Glos; Cockle Wood, Staplehurst, Kent; Cockle Furlong, Drayton St. Leonard, Oxon; Cockleton, near Cowes, Isle of Wight.

Periwinkle Hill, Reed, near Royston, probably takes its name from the plant *Vinca*. Winklebury or Winkelbury Camp, Berwick St. John, Wiltshire, and Winklebury Hill, near Basingstoke, are from O.E. winterburge, a winter camp, and

have no connexion with Littorina. Winkley Farm, Colaton Raleigh, and Winkleigh, Devon, may be derived from Wineca, a personal name, and leah or lea, meadow or clearing, or perhaps Winkleigh, as well as Aldwinkle, near Thrapston, may be derived from O.E. wincel, nook or corner, and leah. There is a Winkle Street in Calbourne, Isle of Wight. Buckie, Banffshire, Buckie Den, a valley near Montrose, and Buckies, Glen Queich, Kinross, are probably connected with Gaelic bucaidh, knob, and not with Scots dialect buckie, wheel. Patella presumably abounds on Limpet Rocks, Torcross, S. Devon. According to Moore (p.33), Shell Top, Dartmoor, is so-called by the country people from its resemblance to a limpet-shell. Of Cornish place-names Mrs. Turk writes: "'Crogean' or 'croggan' means a sea-shell, more particularly limpet shells, large examples of which were used as lamp-vessels in Cornwall. Several places have names based on this word, but whether by association with shells (?kitchen middens) or because the terrain was limpet-shaped, i.e. a hill of this type, is not clear, but the latter explanation is reasonably consistent with the contours, I think." Instances are Roscroggan, near Camborne; Tolgroggan, St. Allen, near Truro; Tregragon, St. Teath, near Camelford; and Scrawston (derived from croggan), St. Ive, near Liskeard. Porthe Brenegan (1580), near Portreath, means 'Limpet Cove' (Nance).

Most names incorporating 'shell' have nothing to do with shellfish, though there are the celebrated Shell Beach, Herm; also Shell Beach (Shell Bay), Studland, Dorset; Shell Haven and Shellhaven Point, Thames estuary; and Shell Ness, Sandwich and Sheppey. The usual derivation of 'shell' names is from O.E. scylf (whence 'shelf'), an over-worked word meaning hill, slope, bank, crag, ledge, peak, tor, etc. Shell Broad, Chapel-en-le-Frith, means a narrow strip of land (Mid. Eng. shovel-brade). Shellow Bowells, Essex, is said to be from O.E. scealh ea, winding river, referring to R. Roding over a mile away. Shellingford, Berkshire, is said to be from a tribal name, Sceringa: after the Norman Conquest, "In names which contain two or more of the liquids l, n or r, loss of one or other of the consonants, dissimilation, assimilation and interchange took place in a way which defies all rules" (Reaney). Shellbrook, a sandbank in the Taw estuary, N. Devon, was Chardellhoke in 1609. Shell Brook, Wincle, near Macclesfield, may be from O.E. sceap or scip, sheep. Shell Farm, Soham, Cambridgeshire, has been derived from O.E. sceldu, shallow place, hence marsh. Shellyay (Sellay, Schilley), Outer Hebrides, means 'seal island'. A few other 'shell' names: Loch Shell or sealg, Isle of Lewis; Shell, near Droitwich; Shelley (at least four); Shellacres, near Norham, Northumberland; Shellag (Cranstal) Point, Isle of Man; Shellyand, near Stowmarket; Shellbank, Bean, Dartford; Shellwood, Leigh, Surrey, and Ugborough, S. Devon; Shellthron, Quantock Hills.

'Snail' is a component of a surprising number of place-names. Snailwell, near Newmarket, may refer to a slow, sluggish stream, rather than to one frequented by snails as suggested by Ekwall. Snail Down, near Collingbourne Ducis, Wiltshire, may be a down frequented by snails (*Helicella?*): Aubrey (p.67) remarks on the abundance of snails on the downs. Snailswell, near Hitchin, is 'Snell's spring' (Snelleswelle, 1298). Other 'snail' names: Snailsdown, Morwenstow; Snailhouse Field, St. Minver, Cornwall; Snailsburn Common, Stanhope, Co. Durham; Snailsden Moss, near Holmfirth, West Riding; Snail House Meadow, Cold Norton, near Stone, Staffordshire; Snailbeach, near Habberley, Salop; Snail Hays, Lower Whitley, Cheshire; Snailpit Farm, Swaffham, Norfolk; Snails-croft, Wardington, near Banbury; Snail's Mead, Buntingford, Hertfordshire; Snailcroft, Leverington, near Wisbech; Snailslinch or Snailslynch, Farnham, Surrey; Snailsome, Hursley, Hampshire; Upper and Lower Snailham, near Winchelsea; Snailcott, Bampton, Devon; Snaily House, near Postbridge, Dartmoor; to which may be appended Helix or Alex Tor, Bodmin Moor, the origin of which is obscure (see J. Conch. 19:342, 1933), and Helix Gardens and Helix Road, Tulse Hill, London.

No doubt there are other molluscan place-names, genuine or spurious, which further time-consuming search through the publications of the English Place-name Society (Cambridge University Press) and large scale Ordnance Survey maps would disclose, but enough have been cited to refute the alleged uniqueness of Musselburgh. Place-names of Celtic origin may conceal some molluscan allusions: a few Cornish ones have been cited. Molluscan place-names occur also in the U.S.A., a selection of which is cited in Stewart, and probably in other countries. This excursion into the realms of topographical etymology has shown how great a part guess-work plays in the interpretation of place-names. In this article the wanton abolition by bureaucracy of some time-honoured county names is scornfully disregarded. I am indebted to Mr. Wilfrid Appleby for inspiration

and information, and to Mrs. Stella Turk and Mr. Oliver Padel for Cornish place-names.

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A. E. Ellis

BATTLES LONG AGO

A great many of the Society's record papers survive from its earlier years and I have been going through these attempting to put them in some sort of order for the possible benefit of future generations (who up to date have expressed no gratitude). Plodding through a lot of old papers, many of them crumpled, dirty or illegible (by no means everyone wrote copper-plate even in the Victorian era), is not everyone's idea of a riot of fun, but there is a certain interest in seeing how things gradually fell into place, one by one, shaping the Society through the generations to become the effective organisation it now is. The process is of course a continuous one, and even if laurels have come to the Society as a result, no one is going to rest on them for a long time to come yet.

Based on the aforesaid mass of books and papers, I attempted to put down the main facts of our history since 1874, finding as I did so, that even with the great quantity of material available, the record was far from perfect in many ways, and facts were sometimes quite difficult to deduce with any certainty. There was on one or two occasions a surprising contradiction between what the Council Minutes said should happen and what actually did; there was for instance, a resolution raising the annual subscription which, as subsequent correspondence shows, was never implemented. Nothing in the minutes withdrew the resolution and a similar one appears about fifteen years later. One cannot expect perfection from minute writers and sometimes the wording makes the Council's intentions far from clear. Allusions to controversies which must have been raging at the time are very tantalising and there were in those days, as always, prickly personalities and members unwilling to accept the verdict of the majority. Although there is nothing specific in the records to say so, the indications are that the founding of the Malacological Society of London resulted from a splinter group of people dissatisfied about the way things were handled.

There is no doubt that in its early days our Society was a very strict oligarchy and the four original members, although they were delighted to have advice and information sent to them from far and wide, considered that they formed an adequate team for dealing with the material and incorporating the results

into Taylor's monograph and Roebuck's census. This had an inhibiting effect on the growth of membership until a number of first-class conchologists, members living in the Manchester area, approached the powers that were with a plea for regionalisation so that they could to an effective extent be their own masters. The end result was a transfer of the Society's H.Q. from Leeds to Manchester, leaving the original team to bear its honours and continue its work undisturbed, while the Lancastrians set to with the wider organisation of the Society. This happened in 1895 after the Manchester branch had been in existence for seven years.

Much of the old correspondence gives the impression that people working along similar lines tended to become rivals. Things at times used to become very acid and it seems a stage that we have grown out of to a large extent - perhaps due to the proliferation of specialist lines of research, certainly the Society itself has become a better medium for co-ordinating and disseminating what work is being done. Previously people often seemed to work in water-tight compartments and to become offended when they found others on similar lines of research.

For many years J. T. Marshall contributed valuable notes on the marine mollusca based on original research and arranged by way of commentaries on J. G. Jeffreys' great work. The then Editor, W. E. Hoyle (curator at the Manchester Museum) must have found him a very prickly character to deal with and there are numerous letters of diplomacy on file which endeavoured to calm him down when he found that other people were also contributing marine notes, sometimes even in contradiction to his own. One article of Marshall's must have contained some very acid comments about a contribution of B. B. Woodward's which made it unprintable from Hoyle's point of view, as we find a letter from him, dated 10 May 1901 pleading with him to modify his remarks and implying that all's not offence that indiscretion sees.

Marshall to Hoyle, April 16, 1902, complains of undue delay in dealing with his articles as a result of which Mr. Woodward's insinuations were 'allowed a year's grace to sink in'. Liberties with his (Marshall's) manuscripts had introduced errors and he accused Hoyle of expressing his own views through Woodward's writings and allowing Marshall's papers to be published only 'in homoeopathic doses'. He would contribute no more.

Hoyle's answer was humble and diplomatic. He would 'see that there would be no further complaints'. He thought it 'a little hard that the Society should suffer for my editorial shortcomings'. Marshall was no more than slightly mollified: 'May I remind you that I have not yet received those pages of my MS (89-91) which you wrote me you had found put away separately? And I will thank you to let me have reprints of my paper up to date if it is not asking too much'. Objection was taken to Marshall's efforts being shown to Woodward before printing while the reverse was not done. Hoyle probably knew that if he did it the results might have driven Marshall up the wall, but he had to plead guilty to being found out, and expressed his sincere gratitude that Marshall had stated his grievances in such admirable detail. They obviously agreed in wishing that there were some other and more god-like Editor. 'It has pained me not a little that any contributor has suggested that I have .. resorted to subterfuge ... I have tried to do my work in fairness ..' Marshall continued to demand editorial protection: 'Mr. Woodward's sentence does not read so innocently ... and being conversant with his proclivities I considered it an unworthy innuendo ...' He had a fixed and lasting impression that Woodward was receiving priority as an editorial policy. Woodward's part in the correspondence does not seem to have survived but another marine researcher, G. W. Chaster, had already taken great offence at Marshall's articles and flayed him unmercifully, if indirectly, in letters to Hoyle. 'His intelligence must be of a feeble order if he cannot perceive that misquotation consists in failing to cite the exact words of a writer ... Is Mr. Marshall so obtuse as to be unable to perceive Mr. Marshall's statements are evidences of the peculiarities of his mental actions The man seems to desire shelter behind a wretched subterfuge'. One letter was inadequate to express Chaster's feelings - he sent two on the same day! Who would be an Editor?

During the same period (about the turn of the century), Hoyle had another controversy on his hands; this concerned a paper on the mollusca of the Isle of Man submitted by L. St. George Byne and Alfred Leicester. Correspondence opens

with a resignation written by Byne in sorrow and grief at the prejudice shown against the paper, and a strong protest by his fellow-author at the criticisms of the referee whose identity was secret. He was not convinced that the referee knew the subject as well as he did and he resented being told that his nomenclature was out of date because a new marine list had come out since the writing of the paper, and was moreover, a list to which there were many objections. Hoyle assured him that the referee was an extremely eminent conchologist and was able to mollify 'young Byne' who wrote that he might under certain circumstances reconsider his resignation. Correspondence was a little less acid than with Marshall and it seems that the correspondents knew each other rather better, addressing each other by their surnames instead of the formal 'Sir'.

Leicester continued to consider the criticisms 'childish and spiteful' and Hoyle, writing unofficially, considered the referee's suggestions 'sometimes needlessly stringent'. He gently pointed out that the authors had had plenty of warning of the newly supported nomenclature, and that it had been made compulsory for nobody. Leicester tacitly approved the Editor's suggestion to put the matter in Council's hands and Hoyle scored a neat point by agreeing the list was but a stage in the developing study of marine mollusca: 'Would you mind telling me what authority and sanction would induce you to use the list? I fear we cannot get a revelation from above to prove its orthodoxy!! Our friend Byne calls it a 'damned' list, thus showing that he regards it as having another source..... I wish you would contribute an article...showing why it ought not to be adopted'. The wind was then taken out of Byne's sails by a letter pointing out that his resignation because of the Council's refusal to publish the paper was invalid, since Council had taken no such action. The paper had merely been sharply criticised.

Council dealt diplomatically with the matter and a joint letter was sent to the authors suggesting some minor modifications and asking that both the 'old' and 'new' scientific names of species should be used side by side. If they agreed, this would be done by one of their members to save trouble to the authors. They did agree and all was well. Byne continued as an enthusiastic member for years afterwards but wrote little more because he became blind. Leicester served a term as President.

Some officers of the Society, as I have good cause to know, seem to attract controversy more than others, and in 1902, wearing his secretarial hat, Hoyle had again to cope with a difficult matter. The somewhat legal-minded Miller Christy wrote from Chelmsford that he objected to the Society withholding publications from him merely because he had fallen into arrears with his subscription. In other words, there was a contract between them and just because he had happened to break it this was no reason for the Society to do likewise. Hoyle referred to Council and replied that his membership could be terminated by written resignation or that the journals were available to him if he paid up, which seems fair enough, but by no means satisfied Christy. As not having resigned, he was entitled to the Proceedings. If he did not get them this was equivalent to expelling him without notice, a thing for which the terms of their agreement gave no warrant. He was going to have the Journals, he was not going to pay, and he would resign. In answer, he was reminded that he had already had three numbers he had not paid for anyway. All right, said he, you can have them back and anyway it doesn't affect the position. He bargains in his next: you send me all the missing Journals, - and I am certainly entitled to them, - and I will undertake to pay up. He was a bit shaken to find out that he did in fact owe for two years; Hoyle sent him his Journals and presumed that his resignation would take effect from the year's end as previously stated. He replied that as the Council saw fit not to persist in a course which they had no right to take, he would at all events for the present - be pleased to allow his name to remain on the membership list. A storm in a teacup of course, but of such things are many of the more wearing of an Hon. Secretary's duties made.

Some peaceful years seem to have followed before another little storm broke over the head of the by now very experienced Hoyle. He received an extremely angry letter from J. Davy Dean to the effect that he had been slaving away at the marine mollusca of Morecambe for three years and did not yet feel prepared to write anything conclusive about so large a subject, but was astonished to read a paper on the subject by H. H. Beeston, written after a ten-day holiday period, which could not but be useless. The wily Hoyle acknowledged the letter but remained ignorant of what Dean would have him do about the matter. Another

broadside from Dean repeated the facts and required the Council to judge between him and Beeston. The official answer was the same: the Council could not see its way to take any useful action, but an accompanying tactful letter from Hoyle seems to have been effective in smoothing things over. No one surely, should refrain from publication merely because he found someone else was writing on the same subject. The Journal was open to everyone, he sincerely hoped Dean would in the fulness of time produce his masterpiece and then surely the world could judge between him and Beeston. All right, said Dean, you win, I'm grateful for your patient explanations, I have recovered my balance, and hope to submit my observations later. Quite handsome.

All Secretaries naturally get a great deal of correspondence which is confidential to the Council and sometimes personally to themselves: often matters which one hopes can be sorted out without the membership having to bother, or to know anything about them. They waste good shelling time enough without that. The incidents quoted partook of that nature. They were not generally known as causes celebres, not like the case of the member who gained temporary fame with a long list of Iceland shells which were new as the result of scientific research, and afterwards found not to exist in Iceland at all. The membership certainly never knew, then or since, of the confidential letters dealt with by Hoyle, but they don't matter in that way any more. Confidentiality dies out after a period of time, being replaced by the raw material of history. The actors on those stages are no longer with us and there can be no objection to using the incidents to give an idea of what went on in the Society seventy or eighty years ago. They can hardly happen in the same way again, the Society has learned as it has progressed, and represents now I hope, less a medium for individual expression than a means for co-ordinating and supporting the collective work of amateurs and professionals alike.

T. E. Crowley

SHELLING ON THE NORTH COAST OF JAMAICA

To celebrate our Silver Wedding in July 1973 we decided to have a special holiday instead of a special party. Naturally there would have to be shells in plenty, but we also considered the length of the journey and the climate in some detail. Of course East Africa would have been ideal from the point of view of finding tropical shells, but the journey was rather long, involving getting a connection at Nairobi for the flight to the coast, and also the temperatures were very high, since that area is so near the Equator. Bermuda had long been a dream of mine, but it is rather expensive and also we had been told that it can be cloudy for many days at a time in July, since hurricanes pass close by. Other far-off islands were discarded because of very high July rainfall figures, and so we settled on Jamaica. By chance I already had quite a collection of Jamaican shells through exchanges with Mary Agnes Wotton. Although she was by then living in New Zealand, we received useful hints from her about the area around Ocho Rios, where we were to stay.

So early one Friday morning we set out for the 3-hour journey to Heathrow down the M.1. We boarded a VC10 before noon and were surprised to find that every single seat in the plane was full. It hadn't occurred to me that we were at the start of the summer holidays and there were many unaccompanied children from Boarding Schools on board, returning to their homes in Jamaica, and also many Jamaicans with their children, going home to their relatives for the summer. The flight and the food were excellent, and we landed at Bermuda (which we could see clearly spread out beneath us) after about 7 hours, for re-fuelling. We were allowed to leave the plane, but were immediately directed to a waiting room with windows too high up to be looked out of, so in fact all we saw of Bermuda was from the air. The next part of the flight took only just over an hour, but by then we had been travelling for about 12 hours and we were pretty tired when we landed at Kingston. It took some time to find our courier and the transport for the North Coast. It was already dusk as we finally set off, 3 couples and the driver, in an enormous old American car which was our taxi. The driver drove with one hand only, and seemed to slam on his brakes at the last minute on the badly-surfaced winding road across the mountainous terrain which separates the South from the North of Jamaica. Overtaking was reserved for bends, and all 6 of us were quite terrified. We did not realise the journey would take 3 hours,

and when we stopped half-way, in the middle of nowhere, at a bar to have a drink, I noticed that the huge tyres on this big car were pretty well bald! We were all very relieved to arrive safely at the Shaw Park Hotel. Of course it was quite dark by then (the sun sets around 7 p.m. all the year round) and we were too tired to try and see what was outside our bedroom window. We just unpacked as quickly as possible - noticing that all our clothes were quite damp and creased - and fell into bed. It was only about 10 o'clock by Jamaican time, but of course we had lost 6 hours on the journey through the time change.

The next morning I drew the curtains and went out on the balcony. It was like walking into a warm bath! We had noticed the humidity during the journey the night before, and it was to remain humid all the time, although there is a strong breeze every day between 10 a.m. and 5 p.m. It is no cooler at night although there is no sun to burn, of course. I must admit I felt rather more lethargic than usual during that holiday, but it did not prevent my looking for shells at every opportunity!

The view that met my eyes was fantastic...exactly what everyone dreams a tropical beach should look like - sand, palms, sea, a native boat fishing quietly offshore. The hotel is right on the beach and of course within minutes I was down there to look for shells. Alas, it was very disappointing. There were very few shells about, most of them at the far end where the beach narrowed into a spit and to find those I had to poke around in clumps of seaweed and other debris brought in by the tide. A few Acmaea, some Natica and rather a lot of land snails. None of those visions of the beach being littered with innumerable Strombus gigas! In fact, the only Queen conches I saw were neatly set out every morning by the natives who were living just behind the spit of land and who obtained them by going diving every day. They certainly did not roll up onto the beach! They also set out some Strombus pugilis, a few Cassis tuberosa and a dishful of single bivalves, mostly Tellina radiata. For all these they asked exorbitant prices. All the Strombus gigas had a small hole in the back, where the muscle holding the animal had been severed (the natives eat the animal). One had to be careful to pick a shell where the hole was not too large as the Jamaicans who live by selling shells are not exactly conchologists. Finally I saw a conch with a very tiny slit and decided that if I could beat down the price to a reasonable level, I would buy that one. I took a week of bargaining to get the price to what I thought I should pay, and I was always worried in case some American guest would snap it up without a qualm. Prices are very much geared to the dollar over there. Of course the fact that I was always looking for shells was soon noticed by the natives who used to try and persuade me to buy shells every time they saw me!

Even snorkelling along our beach produced very poor results and finally we got rather fed up and tried to find a better shelling place. In the end we discovered Turtle Beach. This beach is about 2 miles the other side of Ocho Rios, and is divided into a public and a private beach. The private beach is in fact only private insofar as it belongs to a condominium, the American equivalent of an apartment block for holiday makers - mostly American, as far as we could see. By taking what is known as the "shopping bus", which calls at regular intervals at the hotels along the coast, we managed to get to Turtle Beach about 11 o'clock. Our first stop was the snack-bar for a cool drink and then we set out for the private beach, full of hope. The sand on this beach was blindingly white and there was little shelter from the sun except for the occasional thatched umbrella stuck in the ground. We left our things by one of these and armed only with wide-brimmed straw hats - a necessity in that fierce sun - and the usual plastic bags, we set off to explore. Within yards we could see that we were going to be lucky and we soon found many Lucina, Oliva and Chione, on the sand itself, and by stepping into the sea within a few feet one could see many other shells on the bottom. We would scoop up handfuls of mud and shells and try to let the sand trickle through our fingers whilst keeping hold of the shells. Of course we lost quite a few interesting-looking shells that way, but it was the best we could do. We gradually worked our way along till we came to the end of the sandy stretch and some rocks, where we found more interesting shells, including rock dwellers and limpets. However, the sun was really hot, being mid-day by now and we decided to be sensible and work back towards the snack-bar for lunch. Of course we had to keep swimming every now and then to cool down, but that was no hardship except for holding on to the plastic bags! Finally we came within sight of the condominium and decided to just look at the public beach first! This had been excavated a couple of years previously to make the entrance to the neighbouring

bauxite works deeper for cargo boats, and a lot of dredged material had been thrown up on to the land. One could see thousands of shells amongst the tussocks of grass. But also each wave would bring in heaps of shells and the beach itself seemed to consist almost entirely of shells and shell sand. A freshwater stream - very fast flowing - poured into the sea just there and in the bottom of that were many Chlamys and Arca zebra amongst other species. The public beach was paradise for us! The heat and tiredness forgotten, we bent down and collected all sorts of interesting shells, Chione paphia, C. cancellata, Divaricella quadrisulcata, Lucina pensylvanica, Oliva caribaeensis, O. reticularis, Trivia quadripunctata, various Cymatidae such as carribaeum, muricinum, nicobarium, plieare, Chlamys ornata, C. sentis, Aequipecten muscosus, A. gibbus, Tellina radiata, T. listeri, etc. There were hundreds of Bulla striata and various Natica, - the list is endless.... Suddenly we felt a few drops of rain and knowing what tropical downpours are like, we had to stop at once, collect our things and make a dash for the snack bar, which we reached pretty well wet through! That was the end of our shelling for that day, since it did not stop raining for several hours and in the meantime the minibus had returned to pick us up again.

We made a few more trips to Turtle Beach, but found that we could only stand about two hours in the heat and humidity. In a supermarket I bought a plastic sink tidy with holes in the bottom, which considerably improved the scooping up of shells from the sea bottom.

Naturally we also tried other beaches, but the only one with any useful shells was the one belonging to Sans Souci, a beautifully situated complex of villas set high on a hill-side to the east of the Shaw Park Hotel. There we found Melampus coffeus, M. monile, Strigilla carnaria and Sanguinolaria cruenta, and the tiny green Smaragdia viridis viridemaris. I did not find these anywhere else. Altogether I must have taken home about 5 lbs. of shells in my hand luggage, and when I finally had time to go through them, I discovered I had found 139 different species, some uncommon or rare. Perhaps 50 were new to my collection, so in spite of not finding any large and showy shells myself, I was quite satisfied with what the beaches around Ocho Rios had produced.

I had hoped to be able to reach a small reef, which could be seen from the hotel beach, but it was too far away to swim to, although I did try, with almost fatal results - but from the neighbouring Jamaica Inn this reef seems only about 100 yards away and I believe Mary Agnes Wotton has managed to get to it. However, it is a dead reef and there is not much to be found there. The rocks at one end of our beach were covered in Tectarius muricatus and Nodilittorina tuberculata, of which I was able to collect some live (the day before our departure of course), as well as some Nerita versicolor, many of which covered the jetty supports in front of the hotel. Fish life was disappointing comparing it with Mediterranean waters, although there were plenty of fish, the colours were rather drab. On the other hand, the flora of Jamaica is simply beautiful and due to considerable rainfall in that region, there is plenty of green about. In late July the weather was very variable, and it rained heavily several times, and seemed to cloud over frequently, but we had as much as we could take of the sun! The drinking water is wonderful, clear and sparkling, and the sea is not too saline and sea temperature just right, not too warm as it can be in the Mediterranean. Altogether it was really a special holiday.

H. H. E. Nash

(Note: The author has a list of species collected if any reader is interested)

5th. EUROPEAN MALACOLOGICAL CONGRESS, MILAN 1974

The 5th. European Malacological Congress was held in Milan, Italy, from 2-8 September 1974 and was attended by over 100 delegates from many European countries and some from further afield. The meeting was based at the Natural History Museum, Milan, with some sessions held in the Civic Aquarium and in the Planetarium. Dr. Toffoletto was President of the Congress committee.

The first day was given to a symposium on polymorphism and variation in molluscs. The Congress began on the second day with an official opening and

welcome in the Villa Comunale. Here Dr. Backhuys of the Netherlands gave an opening lecture on the molluscan fauna of the Azores, based on his own research and fieldwork. During the next two and a half days many papers were given in two parallel sessions. One afternoon was devoted to mapping, where progress reports of mapping schemes in the various countries were given. Dr. Kerney gave a paper on the mapping of molluscs on a European basis. The future of European mapping was discussed and mapping was put forward as a UNITAS project for adoption by the general assembly at the business meeting at the end of the week. A list of individuals responsible for running mapping schemes in various European countries was drawn up.

The Congress Dinner was held on the evening of Tuesday 3 September at the Hotel Principe Savoia in Milan.

Friday was spent in the field where two attractive options were open. One party travelled north to the pre-Alps to collect land snails and fossils at Soave Monte, East of Verona and after a superb lunch proceeded to Verona to visit the Natural History Museum and the town. The museum in Verona is particularly noted for its rich collection of fossils.

The second party travelled south to the Appennines where they were able to study the stratigraphy and to collect fossil marine molluscs from very rich Upper Pliocene deposits. They also had a superb lunch. Much useful discussion continued and new contacts were made on the field excursions.

The final papers of the Congress were given on Saturday 7 September and the business part concluded with the general meeting of the Unitas Malacologica Europea. The venue of the next Congress was announced as the Netherlands in 1977.

The Congress week finished with a field excursion to Lake Garda, north of Milan. Reports of finds on the various excursions are given below.

We are grateful to the Italian team and the Congress committee whose work behind the scenes made the meeting possible.

J. E. Chatfield

EUROPEAN MALACOLOGICAL CONGRESS FIELD EXCURSION TO VERONA

Leaders: Dr. A. Girod and Prof. S. Ruffo.

Collecting started immediately in the area around the parking place of the coach near the castle walls. This first habitat of disturbed grass with boulders yielded the following snails Pomatias elegans, Zebrina detrita, Helix pomatia cincta, Monacha cartusiana, Helicodonta obvoluta and after a longer search the slugs Milax rusticus and M. budapestensis.

The party then proceeded at varying paces down a narrow footpath which was overhung by trees and bounded on one side by a drystone wall (local limestone). Large specimens of Chilostoma (25mm) were found deep in crevices in the wall. In moister conditions under a pile of rubble at the base of the wall a good range of living land snails was found. These included Cochlostoma (cf. septemspirale), a small southern European operculate snail; Pomatias elegans, another operculate snail which also occurs in Britain; Delima itala (a clausiliid); Zebrina detrita (family Enidae); Chilostoma planospira and the smaller, paler C. cingulata; Helicodonta obvoluta and Oxychilus cf. mortilleti (= O. villae). Further along the pathway Cepaea nemoralis was found and mostly the yellow and unbanded polymorph. Towards the end of the shaded part of the pathway several live Helix lucorum were found which had recently been introduced to this area.

The footpath then crossed stony limestone grassland with scattered bushes of typical karst scenery. Here there was a marked contrast in the snail fauna and many xerophiles (those characteristic of dry places) were present. The species included Zebrina detrita (found living under stones), Abida (= Granaria) frumentum illyrica, Chondrula tridens; Monacha cartusiana (found living under stones) Candidula unifasciata and Pomatias elegans. Some living specimens were found under stones or in the case of Abida and Chondrula on the ground, but the

large numbers of dead shells suggested the potential richness of the site under moister conditions. However, like many dry limestone grasslands, the individuals are numerous, but the fauna has a fairly limited number of species. Many of these xerophile snails had thick shells and the shells were often white or pale brown in colour. A drystone wall in the open grassland also housed Chilostoma but specimens were difficult to find in this exposed site. Diversions from the molluscan interest of the site were made to observe the large bright green lizards and fossil Protozoa of up to half an inch across (Nummulites) embedded in limestone outcrops and in the limestone walls. The flora was a Mediterranean type with many thorny plants.

On flat dry ground at the top of the hill many white flat-shelled snails were present attached to the tops of vegetation. Some of them were Xerocincta neglecta, but others appeared to be different and the specimens collected are still under investigation.

For those less involved with land snails on the way up (the writer arrived at the top of the hill when the rest of the party were ready to leave) the fossiliferous Tertiary beds (Middle Eocene: Oligocene) of marine molluscs were exposed. Typical molluscs were Velates schmidelianus, Neritopsis agassizi, Ampollina vulcani, Bajana stygis and Cerithium bicalcaratum together with several species of the protozoan Nummulites.

June Chatfield

Footnote: Chilostoma is also used as a sub-genus, in which case it is included in the genus Helicigona. Similarly Xerocincta neglecta is also known as Cernuella neglecta.

EXCURSION TO LAKE GARDA

On Sunday 8 September, in perfect weather, Dr. Girod took a party to Lake Garda. The day was spent in and around Sirmione (UTM 1-km grid reference PR 2539), a picturesque little town of Roman and Mediaeval origins - now a well-known tourist resort - at the tip of a narrow peninsula at the south end of the lake.

The rival attractions of the weather, an excellent lunch and the local antiquities ensured that little serious collecting was done; nevertheless, the following notes may be of interest. Sirmione is on limestone, and the waters of Lake Garda are calcareous. An abundant freshwater fauna, though rather limited in species, was collected on the east side of the peninsula, especially in the drift among Phragmites north of the church of S. Maria Maggiore. Theodoxus fluviatilis (L.), Viviparus ater (Cristofori & Jan), Bithynia tentaculata (L.), Lymnaea auricularia (L.), Unio mancus Lamarck and Dreissena polymorpha (Pallas) were the most abundant forms. Also found were Pyrgula annulata (L.), Lymnaea stagnalis (L.), L. peregra (Müller), Anodonta complanata Rossmässler and Pisidium casertanum (Poli). According to Dr. Girod, Dreissena was first noted here only in 1970, but has since shown a dramatic increase in numbers.

The ruins of the impressive Roman villa (supposedly the home of the poet Catullus) at the northern tip of the peninsula yielded the following, mostly on the stone-work: Pomatias elegans (Müller), Granaria frumentum illyrica (Rossmässler), Oxychilus cf. mortilleti (Pfeiffer), Deroceras sp., Delima itala (Martens) (very common), Helicella obvia (Menke), Monacha cartusiana (Müller); Helicodonta obvoluta (Müller), Chilostoma cingulatum (Studer) (very common) and Helix lucorum L. Later in the afternoon Dr. Wiktor and the writer did some collecting in the fields and hedgerows around the church of S. Pietro in Mavino, about 1/2 km south of the villa. Here we found Lauria cylindracea (da Costa), Vallonia costata (Müller), Discus rotundatus (Müller), Oxychilus draparnaudi (Beck), Milax budapestensis (Hazay), Deroceras sp., Helicella conspurcata (Draparnaud), Monacha cantiana (Montagu), Hygromia cinctella (Draparnaud) and Helix aspersa Müller. Elsewhere Dr. Wiktor succeeded in finding the slugs Milax rusticus (Millet) and Limax flavus L. - a remarkable feat after an unusually dry summer.

M. P. Kerney

Lead by Dr. Ghisotti, Mrs. Ghisotti, Prof. Mezzadri and Prof. V. Parisi

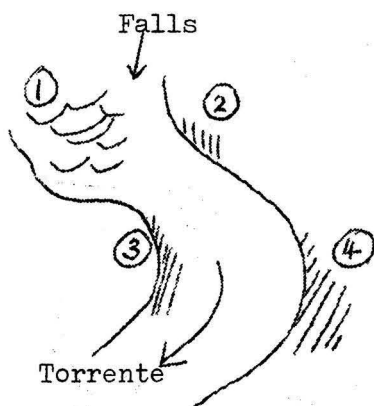
A fine display of Brocchi's type specimens of the marine fossils of the Castello Arquato area (1814 Conchiologia fossile subappennina) was set up during the Congress in the Palaeontological Department of the Museum in Milan.

The Piacenza area of Italy has marine fossil deposits of Plaisancien and Astien (Upper Pliocene) and Pleistocene sections and is famous for the quantity of the species and their good preservation. The area of the Torrente Stirone was studied more recently by Papani and Pelosio (Boll. Soc. Geologica Italiana, Vol. 81, 1962).

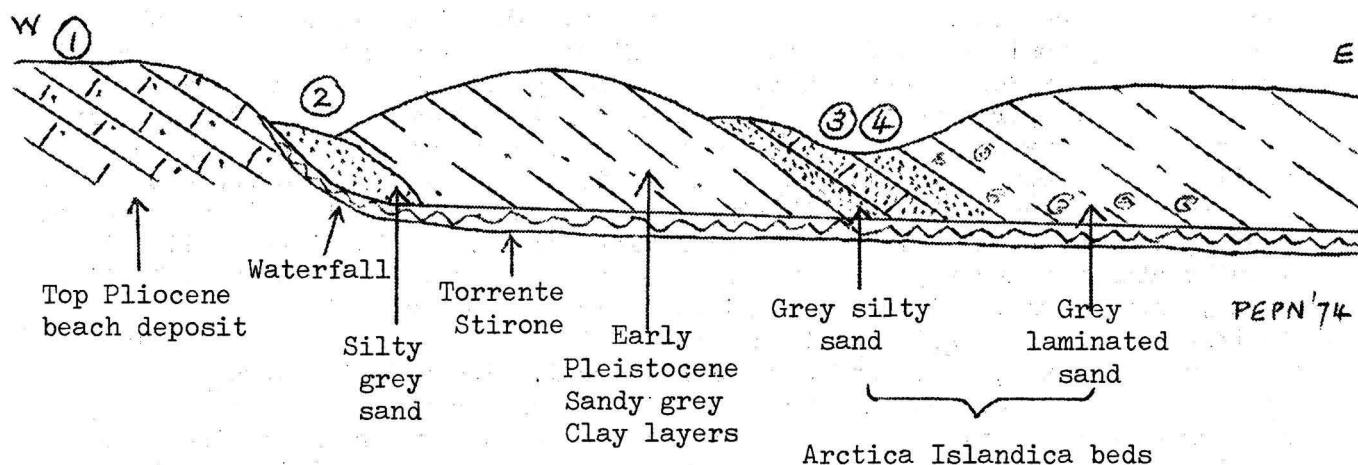
We set out early on a misty morning to cross the Valley of the River Po with its vineyards to Piacenza and on to the foothills of the Appennines. After a short walk we joined the Torrente Stirone at the top of the waterfall over grey sandstone (top Pliocene beach level) and were at once busy examining and photographing the large fossils embedded in rock and collecting where possible. Particularly in evidence were Chlamys opercularis, Pecten jacobaeus and Glycymeris inflatus. Dr. Norton took notes of the geological aspects of the deposits and sections, while others of our party, in evidence Dr. Rigby and Mr. Heppel, helped to collect specimens for exhibition.

Following the river we collected from the banks (sandy grey clay layers of early Pleistocene) and the bed of the river. Many species were found in excellent condition for example - species of Trivia, Turritella, Dentalium and Voluta and Calyptraea chinensis.

BANKS OF THE TORRENTE STIRONE NEAR FIDENZA



SKETCH SECTION about 150m long Dip about 10° NE



150 metres downstream from our start we had an excellent view of the high vertical cliffs (of grey silty sand layers) of the Arctica islandica beds. Again many species in particularly good preservation, large bivalves Arctica islandica, Tapes senescens, Laevicardium oblongum, many small Spisula subtruncata, and gastropods Xenophora and Aporrhais pes-pellicani. Others collected from a brackish-water area finding Dreissena species among others.

In all, over forty different species were collected.

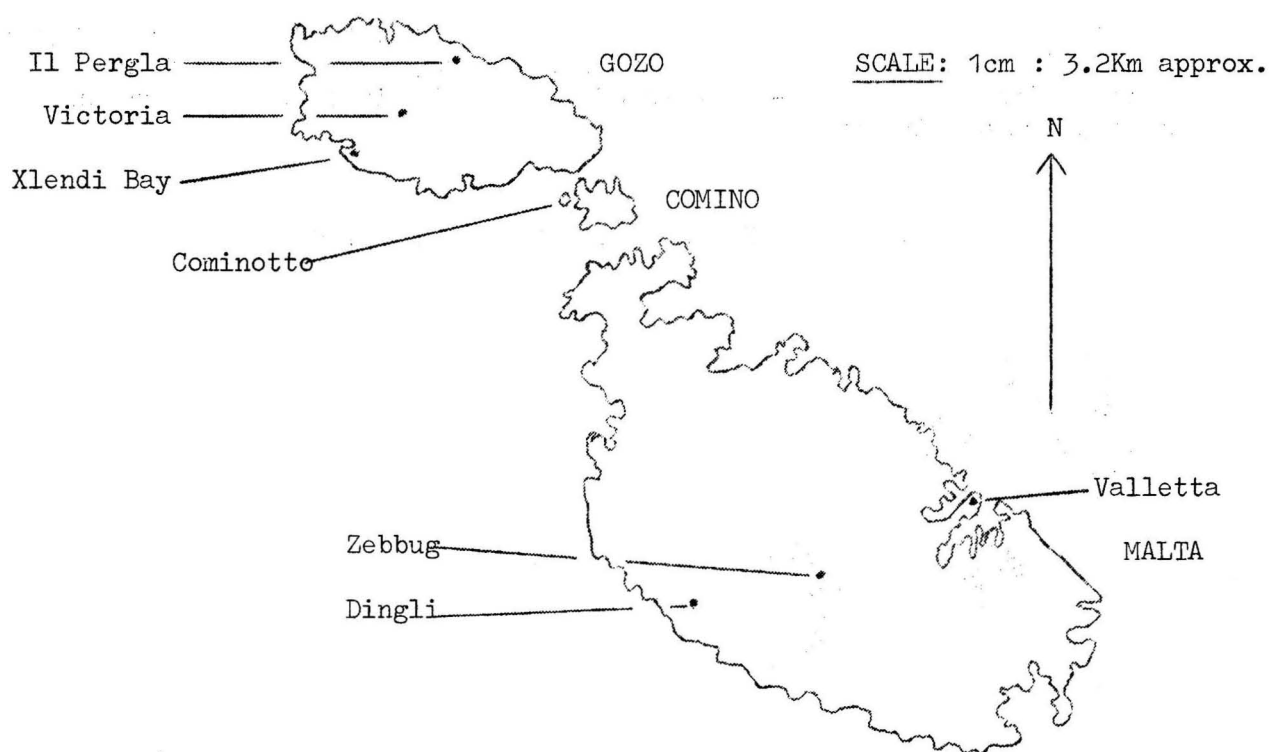
There was some difficulty in dragging our party away from the area with so much geological and fossil interest as well as beautiful country and glorious sunshine.

We had a memorable lunch at a restaurant high up over the plain at Castello Arquato and returned to Milan in torrential rain and thunderstorm.

We are grateful to our Italian friends for giving us so rich an experience.

Joan Llewellyn Jones

MALTESE SNAILS



The Maltese archipelago lies 58 miles due south of Sicily and is situated almost at the centre of the Mediterranean Sea. The five islands are: Malta, Gozo, Comino, Cominotto and Filfla. The first three are inhabited and I visited these in late May/early June 1973. A list of species found is given at the end. The mean day temperature reached the lower eighties Fahrenheit and the terrain was generally dry and dusty. Snails had therefore already begun their summer aestivation. Eobania vermiculata (Muller) is everywhere, very often attached to limestone walls as high up as thirty feet. Helix aspersa Muller is also common tending to have small thick shells with high spires. Theba pisana Muller is locally abundant and appeared in hundreds after a heavy shower of rain lasting twenty minutes on the island of Comino. This was the only time it rained in a fortnight. Pomatias sulcatum (Drap.) (= Pomatias melitensis) was generally found under stones, etc., in loose crumbly soil. The endemic Marmorana melitensis (Ferussac) was difficult to find as the snails had crawled deeply into cracks and crevices in the walls. I succeeded however in finding live specimens at Zebbug, Malta and Il Pergla, Gozo although I feel it must be more widespread. Two Clausilids are found on the islands. The first Papillifera bidens (L.) is fairly common and the other Lampedusa imitatrix (O. Boettger) I

only found twice - at Dingli, Malta and Xlendi Bay, Gozo. Lampedusa is decollate. The smaller Helicidae present identification difficulties and I am grateful to Mr. J. F. M. de Bartolome for his assistance. I should also like to thank the People of Malta for their kind hospitality.

LIST OF SPECIES FOUND

	<u>MALTA</u>	<u>GOZO</u>	<u>COMINO</u>
<u>Pomatias sulcatum</u> (Drap.)	X	X	X
<u>Mastus pupa</u> (Bruguiera)	X	X	
<u>Rumina decollata</u> (L.)	X	X	
<u>Lampedusa imitatrix</u> (O. Boettger)	X	X	
<u>Papillifera bidens</u> (L.)	X		X
<u>Theba pisana</u> Muller	X	X	X
<u>Marmorana melitensis</u> (Ferussac)	X	X	
<u>Sphincterochila candidissima</u> (Drap.)			X
<u>Cochlicella acuta</u> (Muller)		X	
<u>Trochoidea trochoidea</u> (Poiret)	X	X	
<u>Trochoidea numidica</u> (Moquin-Tandon)	X	X	
<u>Helicella cespitum</u> (Drap.)	X	X	X
<u>Helicella spratti</u> (Pfeiffer)	X	X	
<u>Eobania vermiculata</u> (Muller)	X	X	X
<u>Helix aspersa</u> Muller	X	X	X
<u>Helix aperta</u> (Born)	X	X	X

Derek R. Worth

FIELD MEETING - TO MAULDEN WOOD, NEAR AMPHILL, BEDS., 20th. OCTOBER 1974

LEADERS: Dr. A. J. Rundle and Mrs. E. B. Rands

Seven members of the Society and one member of the Bedfordshire Natural History Society assembled in Luton at about 11 o'clock for the Autumn Slug Foray - an annual event whose purpose is mainly to acquaint those attending with as many species of slug as possible. Maulden Wood was chosen as this year's venue partly because it is being studied in detail by the B.N.H.S. towards the preparation of a book on the natural history of the county - a party concentrating on the Mollusca might be able to add to the information so far gained.

The party was taken by car to the large lay-by on the E. edge of Maulden Wood (TL(52)073394). From this point two forays were made into the wood, separated by a break for lunch, and the roadside (A6) verge was searched just before returning to Luton. The following species were found (those preceded by an asterisk are new to the wood):

<u>Carychium tridentatum</u> (Risso)	<u>Arion intermedius</u> Normand
<u>Azeca goodalli</u> (Férussac)	<u>Arion circumscriptus</u> Johnston agg.
<u>Cochlicopa lubrica</u> (Müller)	* <u>Arion hortensis</u> Férussac A & R
* <u>Columella aspera</u> Walden	<u>Arion ater</u> (Linnaeus) agg.
* <u>Acanthinula aculeata</u> (Müller)	<u>Euconulus fulvus</u> (Müller) seg.
<u>Vallonia costata</u> (Müller)	* <u>Vitrea crystallina</u> (Müller)
<u>Vallonia excentrica</u> Sterki	* <u>Vitrea contracta</u> (Westerlund)
<u>Marpessa laminata</u> (Montagu)	<u>Oxychilus cellarius</u> (Müller)
<u>Clausilia bidentata</u> (Ström)	<u>Oxychilus alliarius</u> (Miller)
<u>Cepaea hortensis</u> (Müller)	<u>Oxychilus helveticus</u> (Blum)
<u>Hygromia striolata</u> (C. Pfeiffer)	<u>Retinella nitidula</u> (Draparnaud)
<u>Hygromia hispida</u> (Linnaeus)	<u>Vitrina pellucida</u> (Müller)
<u>Hygromia liberta</u> (Westerlund)	<u>Limax maximus</u> Linnaeus
<u>Monacha cantiana</u> (Montagu)	<u>Limax cinereoniger</u> Wolf
<u>Punctum pygmaeum</u> (Draparnaud)	<u>Agriolimax reticulatus</u> (Müller)
<u>Discus rotundatus</u> (Müller)	

Most of the specimens of Cochlicopa found in the wood were intermediate between lubrica and lubricella and could not be identified with any certainty. The two segregates of Arion hortensis were named by their discoverer, Miss S. M. Davies.

Thirty-two species (if you count the segregates) were found of which eight were slugs. This wasn't a bad list considering the conditions as it was too wet even for slugs!

On our return to Luton we were treated to an excellent curry supper by Mrs. Rands and after a couple of hours talking snails the London members (and one from Belfast) returned to London by train.

A. J. Rundle

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE A.(n.s.)94

ANNOUNCEMENT

Required six-months' notice is given of the possible use of plenary powers by the International Commission on Zoological Nomenclature in connection with the following names listed by case number:

(see Bull. zool. Nom. 31, part 3, 20th. September 1974)

- 1959 Suppression of Donacilla De Blainville, 1819 (Mollusca).
2059 Request for a ruling on the authorship of Conus moluccensis (Mollusca, Gastropoda).
1092 Validation of Aglaia Renier, 1807, Aglaia depicta Renier, 1807 and Aglaia tricolorata Renier, 1807 (Mollusca, Opisthobranchia).
2073 Suppression of Cardium boreale Broderip & Sowerby, 1829 (Mollusca: Bivalvia Cardiidae).

Comments should be sent in duplicate, citing case number, to the Secretary, International Commission on Zoological Nomenclature, c/o. British Museum (Natural History), Cromwell Road, London, SW7 5BD, England. Those received early enough will be published in the Bulletin of Zoological Nomenclature.

December 1974

Margaret Green, Scientific Assistant

GENERAL NOTES

REVISED NEW EDITION OF PAPERS FOR STUDENTS No. 3

A revised edition of this number - "Key to the Land Snails of the British Isles" by A. E. Ellis - has been produced now that stocks of the first edition have been sold out. Mr. Ellis has re-written and modified a lot of his original text in order to make it more comprehensive and even more usable. Three species only added to the British fauna in the last few years are included: Lauria sempronii, Vitrea subrimata and Columella aspera. Copies can be obtained from Dr. A. J. Rundle, [REDACTED], Kew, Richmond, Surrey, [REDACTED]. The price is still 25p to Members and 30p to non-members.

THE SOCIETY'S PUBLICATIONS

Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19 (telephone 01-771 9719) at 25p each, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, 30p to members and 50p to non-members, and can take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

[REDACTED],
St. Helier, Jersey, C.I.
24th. November 1974

Dear Members,

As from January 1975 the Museum of the Societe Jersiaise will be holding a set of BRC Mollusc Record Cards (Land and Freshwater) covering the habitats so far examined in the Island. We would greatly appreciate it if Conch. Soc.

members on holiday in the Island with the intention of collecting would consult these records and if possible choose their collecting sites to fill in some of the gaps in our own local work.

We shall, of course, always be pleased to meet Conch. Soc. members visiting the Island but it would be most helpful if advance notice could be given of such visits.

In addition, we shall always be pleased to receive details from the field notes of past collecting visits - if possible giving the UTM grid references - to help us fill out our records.

With all good wishes,
Yours sincerely,

G. E. H. Long (Rev.)

R.A.F. SUB-AQUA CLUB

Recent issues of the R.A.F. Sub-Aqua Club Newsletters, kindly sent in by Squadron Leader D. A. J. Taylor, have included several reports and notes of interest to conchologists. No. 13, August 1974, 'Expedition to Scapa Flow in June 1974 - to collect samples of substrate for the Conchological Society' and 'Expedition to Loch Sunart, Argyllshire, September 1973 - to assist in the Census of British Marine Molluscs for the Conchological Society' including list of species recorded from the various dives. No. 14, December 1974, 'Isles of Scilly Nature Conservancy Under Water Survey Sites' - to record all species of molluscs (amongst many other marine invertebrates) in order to check any changes during the next 5 years due to pollution, fishing, collection, etc..

A detailed report on the 'Expedition to R.A.F. Gan, Maldives Islands' will appear in a later issue of the Newsletter this year.

P.E.N.

'HABITAT DIGEST' has been included with recent issues of the Newsletter but, because of additional cost, this cannot be continued. However, members who would like to receive a copy should send a stamped, addressed envelope to the Secretary, Mrs. E. B. Rands. Those members who are able to attend meetings can, of course, obtain a copy on request.

Dr. Hans D. Boeters, 8 Munchen 5, [REDACTED], Germany, requires alcohol material of *Hydrobia* - from the shores of Flintshire (locus typicus of *Hydrobia ulvae* (Pennant 1777)/Turbo/) and from the Kentish coast at Folkestone or Sandwich (locus typicus of *Hydrobia ventrosus* (Montagu 1803)/Turbo/).

He is willing to supply the collector with molluscs of Western Europe.

SHELLS FOR SALE

A fine selection of shells for the collector is available at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (telephone 01-437 9391).

EXCHANGE WANTED

Mr. Paul Vella, [REDACTED], Floriana, Malta, wishes to exchange shells from the Mediterranean, Indo-Pacific & South African regions for shells from West African, Peruvian, Panamaic and Caribbean provinces.

NORWAY

I visited the Fisheries Research Institute Library in Bergen, Norway, where I established that no specialist books have been published on the conchological aspects of Norwegian waters. There is, however, a small book on general sea shore life at NKR28 in the Norwegian language which I could obtain on behalf of Members if required.

G. D. Saunders,
[REDACTED], Gillingham, Kent.

ACROLOXUS LACUSTRIS (L.) IN CAITHNESS

During August 1974 Acroloxus lacustris, the freshwater calciphile limpet was found in the Wick River just south of the "Iron Brig" and opposite the "Fairy Hillock" at ND(347517). Since the first find, extensive populations have been found in this area, not only in the river but also in small adjacent ditches and lochans where there is still water of any kind. These populations have extended the known northern range of this species in the British Isles quite considerably, as the northern limit, until August, was Aberdeenshire.

The Wick River is a hard water river which drains the central Caithness flat, an area of calcareous Devonian rock (sandstones and conglomerates). This slow moving and meandering river is an ideal habitat for A. lacustris and typical of a calciphile species.

The habitat of A. lacustris in the river, lochans and ditches is on the submerged stems of the freshwater plants, mainly of the Gramineae and Iridaceae, which proliferate in the suitable areas.

One might say that A. lacustris is an isolated occurrence in the far north of Scotland, but until suitable hard water areas of the north have been thoroughly examined, distribution is uncertain. Orkney and Easter Ross are the most likely areas for this species to occur, as both, geologically, consist partially of the same Devonian strata that occur in Caithness. A. lacustris in Caithness shares its habitat with Planorbis leucostoma, Planorbis crista, Lymnaea truncatula, Potamopyrgus jenkinsi and Apexia hypnorum, while in the mud close by Anodonta anatina shares a typical hard water niche.

Finally I wish to thank Dr. M. P. Kerney for his examination of the species mentioned herein and for his continued help in non-marine mollusca generally.

R. G. Meiklejohn

REVIEW: "HAWAIIAN SEASHELLS" BY ROBERT BOOM, published by the Robert Boom Vo, Box 4349, Honolulu, Hawaii 96813.

Obviously the range of the shells illustrated in this 32-page booklet is limited to those species endemic to Hawaii, but many of these are also found in the Pacific area generally. This booklet is therefore useful to have around for the identification of many Pacific species, and whilst not setting out to be a scientific production, clear data is given with every illustration. The photographs are all in colour and very good, but one could wish that more shells had been shown from both sides. Some cowries are certainly shown dorsally and ventrally, but by no means all, and other species which often have slight variations around the aperture, one would have liked to see illustrated.

The booklet covers gastropods only, but nevertheless it is worth adding to one's library as it costs well under £1.

H. H. E. Nash

THE CENTENARY OF THE CONCHOLOGICAL SOCIETY

We have received several suggestions from members and these are being considered now, but we should still like to have some more ideas on celebrating our Centenary, so please send these in as soon as possible.

APOLOGY

We very much regret the delay in distributing the Programme for 1975. This was caused by the loss of the 'copy' in the Post and the need to prepare fresh 'copy' and instructions for the printer. We hope that members were not unduly inconvenienced.

PUBLICATIONS COMMITTEE

Please note that Mr. A. E. Ellis has retired from the position of Secretary of this Committee and his place has been taken by Mr. T. Pain. Papers to be submitted for the Journal of Conchology should be sent to Mr. Pain, [REDACTED] House, Millbank, London, [REDACTED]

Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

TYRIAN PURPLE: AN ANCIENT DYE, A MODERN PROBLEM

The production of Tyrian purple from various species of shellfish was once a considerable industry in the Mediterranean countries. Although the use of the dye has long been abandoned, the process by which it was made and the chemistry by which the colourless precursor in the mollusc is converted into the richly coloured dye are of much interest. The author of this review has both familiarized himself with the history of the dye and investigated its chemistry experimentally.

Tyrian purple, purple of the ancients, and royal purple, are all synonyms for a dye of molluscan origin which has been known since pre-Roman times (1) and has featured significantly in the development and history of civilizations flourishing on the shores of the Mediterranean Sea and in many other parts of the world (2). (Figure 1).

Details of methods used for the preparation of purple garments have been lost through confused translations and through the cessation of commercial dyeing operations subsequent to the edict of Gratian, Valentinian, and Theodosius in A.D. 383, by which the making of higher quality purples became a State monopoly. Although the dye itself has now no commercial significance, chemical investigations have proceeded since the seventeenth century in an effort to clarify the sequence of reactions involved in its production.

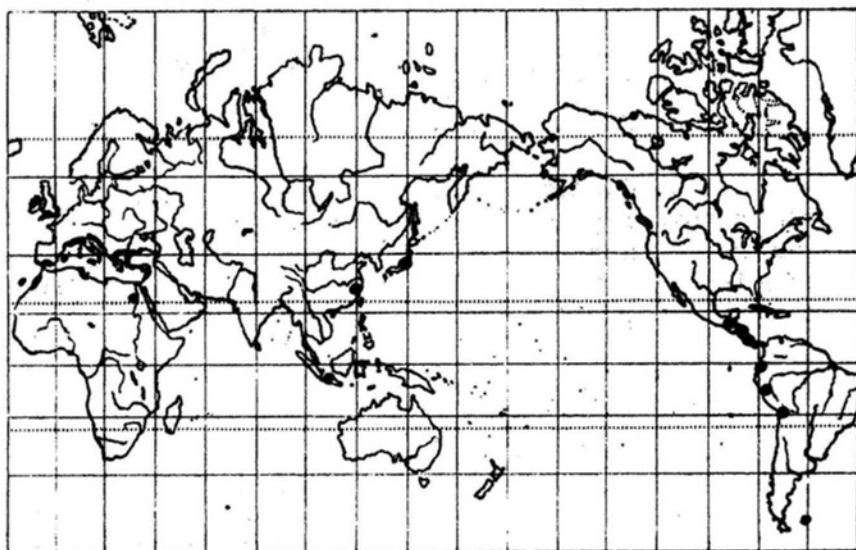


Figure 1 Map of world showing sites of ancient dyeing works (after J. W. Jackson).

There is no purple compound as such within the dye-producing hypobranchial glands of the various species of molluscs of the genera *Murex* of the families *Muricidae* and *Thaisidae* which are the principal sources of the dye. The chemical constitution of the dye itself has been accepted as 6,6'-dibromoindigotin, following the careful work of P. Friedländer (3) published between 1906 and 1909. Even today, however, the full understanding of the sequence of events by which the colourless precursor is converted to purple dye remains to be elucidated.

In 1685 the physician William Cole (4) noted that exposure to light was necessary to produce the purple substance from an original white fluid which 'will presently appear a pleasant light green colour; and if placed in the sun will change into the following colours: light green, deep green, full sea green, watchet blue, purplish red, very deep purple red'. Subsequently, many investigations (5) were undertaken of the type of light most efficient for effecting these transformations. It was found that not all shellfish of the species studied give gland fluid in which the process leading to purple colours

requires light. The processes involved in production of purple from the hypobranchial glands of different species are as open to question as is the true colour of the 'purple' so highly prized in ancient times.

Earlier writings (6, 10) have referred in detail to the problem of defining the colour of Tyrian purple. On historical evidence, the colour had been described by C. E. Pellew (7) as ranging from 'brownish red to bluish grey through violet, purple and even deep indigo blue'. H. de Lacaze-Duthiers has illustrated (8) a series of purple colours produced from different species of molluscs, and stresses the impossibility of agreement on any one colour unambiguously representing the Tyrian purple of ancient times.

Modern ideas that the colour of Tyrian purple was violet over a deep-red background may well have arisen from such old descriptions as *purpura hyacinthea* (a violet shade like that of the hyacinth blossom) and those due to E. Ploss (9) who called it 'bluish-red merging into violet'. The elder Pliny (10) considered Tyrian purple best when 'it is the colour of clotted blood, dark by reflected and brilliant by transmitted light'.

Our own work on the different species of purple-producing molluscs of the Mediterranean confirms that a wide range of colours is in fact possible, depending on the choice of shellfish and on the method of preparation.

The origin of the name Tyrian purple

Abbreviated reference to the historical and mythological derivation of 'Tyrian' may be found in several articles (11), but only Ploss (12) has reproduced the translation from the fourth-century Greek romance 'Leucippe and Clitophon' by Achilles Tatius to give the historical derivation, and from the *Onomasticon* of Julius Pollux - a ten-volume Greek dictionary of the second century - to give the derivation from Greek mythology. Regardless of which origin is correct, the name is now commonly associated with the city of Tyre, and it is significant that Virgil called the same colour *sarranus*, from *Sarre*, the former name of Tyre.

J. W. Jackson (13), however, does not believe that Tyre was the site of the original purple-dyeing works. He believes that Leuke, a small island to the south-east of Crete was producing purple before 1600 B.C., and quotes the findings of the Currelly and Bosanquet expedition to Leuke in 1903, when shells of *Murex trunculus* were found in association with pre-Phoenician artifacts (14).

The origin of the word 'purple' is even more obscure. It is possible that the Latin *purpura* is derived from the Greek *perphyra*, which can be related to *phyro* (to wet, or mix) and *phorphyro* (to be combined). Thus the word could have been originally a professional term of the earliest Greek dyers (12). Possibly, the true origin is a term, now lost, used to describe the species giving the dye. It has been claimed that the *purpura* was not only a species of purple-producing shellfish, but also the purple itself, both as an industrial product and as a colour.

Methods of dyeing used by the Ancients

In this review, discussion is confined to the Mediterranean dyeing industry, for which several authors have given widely differing accounts of the methods used (5, 15).

The source of the dye, at least, is not in doubt. It is described as a small whitish 'vein' situated transversely under, but in immediate contact with, the shell. The best results were obtained working with live animals. The glands of the larger shell-fish were separated from the rest of the animal, but smaller varieties were crushed whole, shell and all. There is evidence that where the gland was removed intact, special instruments were used. Neither Pliny the Elder (10) nor Pliny the Younger (16) described a method for the removal of the gland but they did report that only the gland was used for the dyeing process.

The confusion existing as to the method of dyeing used by the ancients may well stem from the elder Pliny's writings, in which he described three distinct methods; in subsequent accounts these have often been confused. It is there-

fore worth considering Pliny's original writings, as translated by K. C. Bailey (17). Cap. XXXVIII, sect. 62, states:

133. 'The vein already mentioned is then extracted and about a sextarius (approx. 7 lb) of salt added to every hundred pounds of material. It should be soaked for three days, for the fresher the extract, the more powerful the dye, then boiled in a leaden vessel. Next, five hundred pounds of dye-stuff, diluted with an amphora (about 8 gallons) of water, are subject to an even and moderate heat by placing the vessels in a flue communicating with a distant furnace.

134. Meanwhile the flesh which necessarily adheres to the veins is skimmed off and a test is made about the tenth day by steeping a well-washed fleece in the liquefied contents of one of the vessels. The liquid is then heated till the colour answers to expectations. A frankly red colour is inferior to one with a tinge of black. The wool drinks in the dye for five hours and after carding is dipped again and again until all the colour is absorbed'.

Pliny then speaks of the need to use both the 'non-fast' Buccine dye and the fast Pelagian dye to obtain the best results. The amounts required are surprisingly large: '200 lb of Buccine extract and 110 lb of Pelagian are used for every 50 lb of wool'. It is clear that operations were conducted on a considerable scale.

The Tyrian method is also described: 'the Tyrian colour is obtained by first steeping the wool in a raw and unheated vat of Pelagian extract, and then transferring it to one of Buccine'.

138. 'Conchyliated garments are prepared by a similar method to the first, but no buccine extract is used and the dye is diluted simultaneously with water and human urine. Only half the usual amount of dye is used'. This method gave a paler shade, which was fashionable in Pliny's time.

The ancients introduced several modifications to produce different colour tones. Many of the dyes developed by the ancients were the result of steeping the fibres in vats derived from glands of different species of shell fish; in some cases, kermes, (derived from an insect parasite of the kermes oak) was used as well. The Ancients applied the dye to fibres and never to a piece of material, ensuring a maximum intensity and uniformity of colour. Pliny indicates that urine was used only in the preparation of 'conchyliated' purple, but it is probable that it was used more extensively.

If these interpretations are correct, the true Tyrian method did not involve a vat dye: that is, one soluble only in its reduced, colourless, form. There is, however, evidence of a vat-dyeing scheme of the following kind. The glands were excised, placed in a lead vessel, and covered with about 7 per cent of their weight of salt; the mixture was ground together, and allowed to stand for three days. The yellow-brown suspension was then diluted with water and urine and heated gently for about ten days. Meat particles, fat, etc., rose to the surface as a foam which was removed periodically. After ten days, the volume had reduced to about one-tenth of the original; urine and honey were added to produce a satisfactory viscosity, and heating was continued. The liquor was tested by steeping a well-washed, degreased fibre in it, and then exposing it to bright sunlight. If the colour shade was not satisfactory, other liquors were added.

Elsewhere in the ancient world it would appear (13) that methods of dyeing were less well developed, and involved a greater use of direct gland secretion than did methods in major dyeing works on the Mediterranean.

Our own work with Mediterranean species would suggest that a far more detailed consideration of dyeing methods may be desirable because of the widely differing glandular constituents of Mediterranean species, which may have been of importance in ancient times.

Molluscs used by the Ancients

Pliny's descriptions of the shells used by the Ancients do not make clear which molluscs were actually used, and different authors attach importance to different species. It must be accepted, of course, that the current distributions of the various species are not necessarily the same as those in former times.

Schaeffer lists the most important Purpura species as:

<u>Type</u>	<u>Source</u>	<u>Type</u>	<u>Source</u>
<u>P. haemastoma</u>	Atlantic Ocean (African Coast)	<u>P. patula</u>	Gulf of Mexico
<u>P. lapillus</u>	Atlantic Ocean	<u>P. persica</u>	Gulf of Mexico
<u>P. madreporarum</u>	Atlantic Ocean	<u>P. aperta</u>	Gulf of Mexico

Although it has been reported that Purpura haemastoma does not occur in the Mediterranean, Jackson (13) believes that it is widely distributed in this area - in Provence, Corsica, Sardinia, and Sicily. Certainly it is now readily available off Southern Italy.

The most important Murex species are:

<u>Type</u>	<u>Source</u>	<u>Type</u>	<u>Source</u>
<u>M. brandaris</u>	Mediterranean	<u>M. erinaceus</u>	Coast of Normandy
<u>M. trunculus</u>	Mediterranean	<u>M. cornutus</u>	Atlantic Ocean (African Coast)

Species most often referred to as of major importance in ancient dyeing works are M. brandaris, M. trunculus, M. erinaceus, P. haemastoma, and P. lapillus. In Japan, Rapana bezoar, closely allied to Purpura, was of importance in their ancient dyeing processes.

On the basis of shell mounds found near sites of ancient Mediterranean dyeing works, M. brandaris and M. trunculus were the principal molluscs used, some use being made also of M. erinaceus, P. haemastoma, and P. lapillus. Murex brandaris lives on sandy or muddy bottoms and in considerable depth of water (10 to 150 metres) whereas all other species listed are found in relatively shallow water (0 to 15 metres). Pliny described the method of catching Murex in wicker baskets and Möhres in 1963 reported (15) that M. brandaris was still caught in mussel-baited baskets for the Venice markets. Near Venice and Naples today, vast quantities of M. brandaris are collected by trawlers with dredges, but the market is for human consumption and not for dyeing.

Our recent investigations in Naples reveal that M. brandaris yields considerably less dyestuff precursor per gland than does M. trunculus or P. haemastoma. Further, because M. trunculus and P. haemastoma, as shallow-water dwellers, are more accessible than M. brandaris, one wonders if the Ancients may not have first worked with M. trunculus and P. haemastoma to produce purple dyes and sought the deeper water M. brandaris only when supplies of the other species became less abundant. The rock-dwelling P. haemastoma and M. erinaceus would have been particularly accessible. Unless the smaller M. erinaceus was once available in certain localities in vast numbers, it is unlikely that this species was economically significant.

Popularity and use of Tyrian purple from ancient times

The Bible frequently refers to the colours blue, purple, and scarlet, the latter usually being the colour obtained from kermes. Purple is often referred to in connection with Tyre and appears to mean the colour developed from the 'purple shellfish'. The Old Testament gives examples of the variety of uses of purple in connection with important buildings, people, and events. Exodus refers to the purple curtains of the Tabernacle and to the purple in Aaron's garment. Purple is connected with Tyre in Chronicles II. Ezekiel refers to purple of Syria and of Tyre and Judges mentions purple worn by royalty. Purple was also used to honour people; in Esther, King Ahasuerus honoured Mordecai the Jew by giving him 'a garment of fine linen and purple'.

Purple dyes were used by Egyptians at an early date. A papyrus dating from the time of Rameses II (1400-1300 B.C.) mentions the purple-dyeing trade. Subsequently both the Greeks and Romans used the purple colour extensively and the famous Greek infantry - the Hoplites - wore purple tunics both to impress the enemy because of their splendour, and to conceal blood from their wounds. At sea, the Admiral's vessel was distinguished by purple sails.

In Rome, the Equites (or Knights) wore a narrow band of purple on their togas, whereas the senators were distinguished by a single broad band of purple down the front of the tunic. The Imperator (or Commander-in-Chief) wore a purple cloak which, hoisted on a spear, was a rallying point in times of danger. A victorious general on return to Rome would receive a purple cloak with gold embroidery.

Sixty years before the reign of the Emperor Augustus (63 B.C. - A.D. 14) the violet-purple was fashionable (cost 100 denarii a pound); then came Tarentine red, and finally the Tyrian dibapha (twice dipped) which cost more than 1000 denarii a pound. Purple dyes from various sources were used in almost every house at this time, and Lentulus Spinther in 62 B.C. used the dibapha for the praetexta (an outer garment worn by the children of nobility) - only to incur the disapproval of the court for using so common a dye.

But the price of purple dyes continued to increase and imitations were more widely used (see later). By A.D. 300 the prices had risen steeply, as illustrated by a famous Edict of Diocletian (A.D. 284-305) in which he made possibly the first attempt to introduce price control. Mommsen (18) records the prices per constant unit weight as follows:

Doubly-dyed purple silk	150000 denarii
Doubly-dyed purple wool	50000 denarii
Red-dyed purple wool	32000 denarii
Violet-dyed purple wool	10000 denarii
Imitation purple wool	400 denarii

The doubly-dyed purple garments became used more and more by royalty and less and less by others. Pure purple dyes became protected by laws enacted under the Roman emperors and any person outside the court who wore a garment dyed with pure purple could be convicted of treason and put to death. This purple was called *purpura hyacinthea* and was reserved to the Gods and the Roman Emperors. In the legal code of Theodosius the Great (A.D. 379-395) it appears as '*murex sacer adorandus*' (12) (the sacred purple fish which is to be worshipped). The Byzantine emperors used the purple dye in an ink which was reserved for their use.

When the Eastern Roman Empire succumbed to the Turks, the purple-dyeing factories of Tyre - more than 1000 years old - were destroyed. Tyre was almost completely demolished by the Saracens in 1291 when they recaptured it from the Crusaders. Purple dyes were produced in a few isolated centres until, with the fall of Constantinople in 1453, dyeing with purple from shell-fish, in the Mediterranean, ceased entirely.

During the era of purple dyeing on the Mediterranean, many centres grew rich through its production - from the original Tyre (now Sur) and Sidon (now Saida) in Asia Minor, the industry spread to Carthage, to the islands of the Greek Archipelago, to Tarentum in Southern Italy, to Marseilles, and as far west as Cadiz on the Atlantic Coast.

Several modifications were implemented to reduce the cost of purple dyes. One of these was to dye the material first with kermes and then with a vat from the purple shellfish. The term '*hysginus*' or *hysgic purple*' was associated with this colour; garments dyed in this manner were about one-tenth the price of the genuine article.

Two manuscripts from 300 B.C., found in an Egyptian tomb - the Papyrus Graecus Holmiensis and the Leyden Papyrus - give directions for preparing imitation dyes. The recipes indicate that kermes, madder, and indigo (woad) were used as substitutes for purple at that time.

Modern interest in purple dyes from shellfish appears to have arisen from William Cole's report (4), in 1685, of a minor dyeing industry in Ireland, and his subsequent work on *Purpura lapillus*. Since that time only isolated usages of the purple dye have been reported, and the main interest has been in understanding the nature of the purple dye, and the mechanism of its production from the natural colourless precursor.

Recognition of the relationship between indigotin and Tyrian purple

Until the early 1900s, the possibility that Tyrian purple was a derivative

of indigotin was not recognised. Some of the reported methods of dyeing for Tyrian purple did not obviously relate to those for indigo, originally obtained from indoxyl glucoside (indican) which occurs in many plants of the genus *Indigofera*. (The term indigo is used for the mixture of dyes obtained from indican and the term indigotin for the pure chemical species).

Baeyer's laboratory synthesis of indigotin in 1883 eventually led to a commercially successful synthesis by Badische Anilin- und Sodafabrik (BASF) in 1897 and the application of indigo to a variety of fibres is now most often achieved by means of the leuco dye produced by alkaline hydrosulphite reduction of indigotin.

Several halogenated derivatives of indigotin have been prepared commercially and the cheaper chloro derivatives have gained favour over the natural Tyrian purple, which, depending as it does on the molluscs used, must have varied widely in colour standard.

Chemistry

After Cole had awakened interest in the complex colour transformations to purple, a host of workers from Reaumur onwards have contributed to a progressive understanding of the processes involved in production and in the identification of the principal components of Tyrian purple and intermediate compounds. However, the work extends over a number of species and what is found to be true of one species may not necessarily be valid for another.

Our own initial work (20,21) involved a study of the production of Tyrian purple from an Australian mollusc *Dicathais orbita* Gmelin, not previously investigated by European workers. This mollusc has a clearly defined hypobranchial gland which on extraction, yields only one absolute precursor to 6,6'-dibromoindigotin (1).

Subsequent investigations on species of historical importance, from the Mediterranean, England, Japan, and Costa Rica reveal not only that *D. orbita* is in no way typical of other species, but also that wide differences exist between species already investigated. H. Fouquet and H. J. Bielig (22) have also reported briefly of their findings on differences in the Mediterranean species.

Whereas ether solutions of gland extracts from *D. orbita*, *P. haemastoma*, *M. brandaris*, and *M. erinaceus* give relatively simple mixtures of compounds that are readily accounted for, the ether extract of *M. trunculus* glands from live animals gives a highly coloured solution which when subjected to thin-layer chromatography on silica gel using benzene: acetonitrile (2:1) showed three distinct purple bands and one major blue band on a plate showing eight bands in all. All compounds have not yet been identified.

The major end-product of 6,6'-dibromoindigotin is well established. 6-Bromoisatin would be expected to be present in photochemically produced dyes, and some dull colouration could be due to this latter compound. 6,6'-Dibromoindigotin has been characterized in ancient objects, mainly by spectroscopic methods. In infrared analysis we have found that the infrared spectrum will vary significantly, depending on the method of preparation of the pure 6,6'-dibromoindigotin.

J. T. Baker

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Acknowledgment

We are grateful to Dr. Baker and to 'Endeavour' for permission to reprint this article.

A number of chemical formulae and details, together with several coloured illustrations and technical diagrams, have been omitted.

Newsletter Editor

WHY COLLECT SHELLS?

"The accumulation of rare and beautiful shells has ever been viewed as forming a more elegant cabinet than any other department of natural history, not only from their easy arrangement, variety and beauty of colours, and singularity of shape, but from their durability and facility of collection. They have hence become an interesting source of amusement and delight."

"But although it has been usual to consider conchology merely as a source of amusement or ornament to the collector, or as filling up a department in one of the classes of natural history, we may venture to offer it as a subject of much higher consideration and interest to the student in geology, as one of the means of elucidating the relations of the different parts of the earth, to which we can or may have access. The connexion of all the parts of natural history with geological knowledge, has at length been considered as a powerful instrument in the promotion of this sublime science, which, though as yet in its infancy, has, like the young Hercules, given glorious promise of a sound and vigorous maturity."

"The philosopher, for example, will examine with delight and wonder the vast mass of diluvian marine shells, mixed with siliceous sand in its several degrees of induration and cementation, and totally different from the sand of the adjacent shores, deposited near the very summit of Haldon hill, to the north of the town of Teignmouth, and enquire, with busy curiosity, by what process of nature they have been fixed there, at the height of eight hundred feet above the level of the sea. Probably a vortical deposition at the time of the general deluge, round the summit of the original mountain."

The above quotation is from the appendix on Conchology in "A guide to the watering places, on the coast, between the Exe and the Dart; including Teignmouth, Dawlish, and Torquay, embellished with a general view of Teignmouth and Dawlish, and the various seats around them, with a short description of the

neighbourhood. Dedicated, by permission, to the Right Hon. Lord Viscount Exmouth. Teignmouth: printed and sold by E. Croydon, Public Library; also to be had of Knighton and Westcott, Dawlish, and Cole, Torquay. 1821" (dedication dated 12 August 1817). On page viii it states that "Delicacy forbids the publisher from revealing the names of those who have assisted him; the articles of conchology, and botany, will speak for themselves: for the rest, he craves the indulgence of a liberal public. He trusts, if they do not reap information, they will amusement, in the perusal of this little work." The section on "Conchology. An enumeration of such marine shells, as have been found on the adjacent coasts, with references, to the best engraved figures" is known to be by Dr. William Turton, in spite of this coy reticence. This was reprinted, with minor alterations, in "The natural history of the district; or, lists of the different species of animals, vegetables, and minerals, and their respective localities, scientifically arranged; with reference to the best standard works in which they are figured and described: together with a geological account of the rock strata, and the fossils contained in them. By W. Turton, M.D., and J. F. Kingston. Teignmouth: printed by and for E. Croydon, at the Public Library; and sold by C. and J. Rivington, Baldwin and Co., and Whittaker and Co., London; Gore, Dawlish; Cole and Luscombe, Torquay; and all the booksellers in Exeter" (1830). This volume is the second part of "The Teignmouth, Dawlish, and Torquay Guide; with an account of the surrounding neighbourhood, its scenery, antiquities, &c. By N. T. Carrington, and others. Embellished with a map, and lithographic views" (1828). The reprinted section on conchology is followed by a supplement entitled "Conchology, arranged on the amended system."

Conclusion: "Natural science has now become so popular, that any arguments setting forth its importance and utility would be superfluous. 'It tends,' says an able naturalist, 'to keep alive the better feelings and more valuable energies of our nature; affording to youth delights equally pure and vivid - to maturity, calm and grateful occupation - to old age, the most pleasing materials for agreeable and salutary reflection, and whilst their votary enjoys the disinterested pleasure of enlarging the intellect, and increasing the comforts of society, he is himself independent of the caprices of human intercourse and the accidents of human fortune. Nature is his great and inexhaustible treasure, his days are always too short for his enjoyment, ennui is a stranger to his door; at peace with the world, and his own mind he suffices to himself, makes all around him happy, and the close of his useful existence is the evening of a beautiful day.'"

So now you know why one collects shells.

A. E. Ellis

ROCK PLATFORMS AND INTER-TIDAL REEFS IN VICTORIA

The spectacular richness of tropical seas and coral reef faunas, such as those of the Great Barrier Reef is well known, but the, perhaps subtler, offerings of temperate Australia deserve equal fame. There is plenty of interest and often great beauty among the molluscs to be found on the southern coasts of the continent, even within the limits of exploring from the shore. I was lucky enough to spend three years in Australia relatively recently and also to work with the Marine Study Group of Victoria and the Victorian Branch of the Malacological Society of Australia who are active in littoral research in what is part of the Maugean zoogeographical province. Much of their work is concentrated on two large almost enclosed bays in central Victoria, Port Phillip Bay with Melbourne at its head, and Western Port just to the east, so this article is mainly about sheltered inter-tidal platforms in Western Port where at the time of my stay an active littoral survey was being carried out.

Nearly all the littoral rock platforms in Western Port are in its southern half away from the mud and mangroves at the top end. Often they are almost level basalt flows (Older Volcanics) of probably Oligocene age. The rocks are often relatively soft so loose boulders are plentiful, as are pools, and the micro-habitats are correspondingly varied. Being sheltered and without a great tidal range, bay platforms do not show the conspicuous vertical zonation of plants and animals seen on open coasts but they do have a very diverse fauna,

rich in species which like quiet conditions and with some whose main range is farther north in warmer waters. The open coasts show more marked zonation as has been said and the species found tend to be limited to those which can stand heavy seas and fast moving water. Also, the east and west ends of Victoria, some 500 miles apart, differ from the centre as elements of the E. Australian (Peronian) and S. Australian (Adelaidean) faunas occur within the state borders.

To anyone familiar with rocky shores round Britain the molluscs on an inter-tidal platform in Western Port will seem often familiar at the family level though the species will be virtually all strange. Areas longest out of the water have relatively few species but large numbers of each - littorinids (e.g. Bembicium nanum (Lamarck)); trochids (especially Austrocochlea constricta (Lamarck)), "whelks" (Dicathais and Cominella spp), "limpets" (Cellana, Notoacmaea and Montfortula spp), and even mussel beds (the flea-sized Modiolus pulex (Lamarck)) on which small muricids, Lepsiella spp, prey, together with unfamiliar things - a black neritid snail, Melanerita melanotragus (Smith), under almost every boulder, pulmonate limpets, Siphonaria spp (especially diemenensis (Quoy & Gaimard)), and, conspicuously, many chitons, also under the stones. Australian and New Zealand shores and waters are centres of chiton diversity and single localities in Victoria are known to harbour up to thirty species, many beautifully patterned and subtly coloured in greens and browns. Chitons, like other animals, show vertical zonation on the shore with Ponero-plax spp. in the more exposed positions.

A minor but interesting upper reef habitat is the Zostera grass patches in shallow pools near the shore. These contain a small mollusc community of rissoids, the small cerithiid Diala lauta (Adams), trochids (Minopa spp and Cantharidella tiberiana (Crosse)), and, at times, bubble shells.

Permanent pools contain a more varied fauna, especially towards the outer edge of a platform. Browsing on algae one finds turbinids like Warreners, Subnirina undulata (Solander), and brilliantly coloured Pheasant shells, Phasianella australis (Gmelin) (P. ventricosa (Swainson) seems to prefer deeper or more open waters), trochids, iridescent Cantharidus and Phasianotrochus spp, Austrocochlea odontis (Wood) and sometimes A. adelaidae (Philippi), and small rissoids and Columbellidae. Cymatiids (Cymatiella spp) and the only common Victorian cone, Floraconus anenome (Lamarck) can be found under submerged stones. The pools are also good for finding nudibranchs which are in great variety - Robert Burn of Geelong has been working on the Victorian opisthobranch fauna for many years and is still finding undescribed species - though most visitors only find a few, often the bright red largish Ceratosoma brevicaudata (Abraham). Careful search of the bright green skeins of the alga Caulerpa can reveal small sacoglossan bivalved gastropods such as Edentellina typica (Gatliff and Gabriel), concoloured with the weed.

Most collectors on a reef go hell-bent for the seaward edge for it is here that more attractive molluscs are found, mitres, cymatiids such as Cabestana spp, muricids such as Torvamurex denudatus (Perry), and above all perhaps Notocypraea cowries which get over-collected in any accessible locality. Here one can also find abalones such as Schismotis laevigata (Donovan) and Notohaliotis spp, the fascioliid Pleuroploca australasia (Perry), and sometimes the buccinid Austrosipho grandis (Gray), some of the more spectacular Clanculus trochids, and occasional cancellariids like Nevia spirata (Lamarck) and Sydaphera lactea (Deshayes). Being mainly sand or fairly deep water dwellers, volutes are rare on Victorian reefs but fresh shells of Amorena undulata (Lamarck) turn up from time to time.

Few species of pelecypods occur on littoral reefs; Modiolus pulex has already been mentioned, and another mussel, Brachidontes rostratus (Dunker) also forms beds as can Mytilus planulatus (Lamarck) (shell very like M. edulis L.). A small ark, Barbatia squamosa (Lamarck) is often found attached to the underside of stones, while the larger B. pistachia (Lamarck) lives in deeper pools or around the reef edge. Sand patches often contain tiny Pronucula spp. or, if deeper, the venerid Katelsia rhytiphora (Lamy) while ephemeral minutiae like Micromytilus crenuliferus (Tate) live on algae in pools.

Cephalopods are not conspicuous on littoral platforms in the Western Port area; perhaps the commonest is the beautiful little Blue-ringed Octopus,

Hapalochlaena maculosa (Hoyle) found near the outer edge, which should be handled with care as its bite can be fatal very quickly. Fortunately it is relatively docile and most recorded bites have been the result of gross mis-handling.

Western Port and its environs have been under scrutiny since the early 19th. century; in 1835 the Frenchmen, Quoy and Gaimard described specimens from there collected during the voyage of L'Astrolabe which arrived in Australian waters in 1826, but the bulk of molluscan research by local investigators was done by J. H. Gatliff and C. J. Gabriel in the first half of this century. Even now though, its molluscan fauna is not fully known.

In recent years there has been something of a shift from straight collecting to ecological surveying of molluscs in Victoria. Surveys have been carried out in Port Phillip Bay, and more recently, beginning 1968, in Western Port where there has been a spur in the form of industrialisation and large plans to accelerate it. Besides governmental efforts, the Marine Study Group of Victoria carried out a general littoral survey of Western Port's marine fauna and flora from late 1968 to May 1970, an Interim Report on this survey being published by the Group in August 1971. Since then the Marine Study Group has been making more detailed studies on a reef near Shoreham, Victoria, partly to find out more about the distribution of animals, especially molluscs, spatially and by season (on which there is little published information), and partly as an anti-pollution monitor. In addition members of the Victorian Branch of the Malacological Society of Australia have recorded some 250 species of molluscs from a platform area at Flinders over the past sixteen years.

In conclusion I would like to make two points. First that such a brief account as this must of necessity be very incomplete; I hope that readers with knowledge of the Victorian fauna will forgive the omissions. Secondly, without the help and friendship of the many members of the two bodies mentioned above, I would have missed many wonderful experiences, and would also have been unable to write this account.

D. C. Long

AEGOPINELLA ?NITENS (MICHAUD) IN BRITAIN

Shells of the zonitid genus Aegopinella ("Retinella" in part of British authors) are characterized by a flared last whorl, and a dull waxy sheen caused by microscopic spiral striations crossing the growth-lines. In Britain we have long recognized the presence of a small species (A. pura (Alder), 3.5-4mm) and a much larger species (A. nitidula (Draparnaud), 8-10mm). However, we should be alert to the possibility that other species may also occur here. In N.W. Europe there exist at least three further large species not unlike A. nitidula: A. nitens (Michaud), A. epipedostoma (Fagot) and A. minor (Stabile).

Among some Mollusca collected by Mr. I. D. Finney in 1966 in old deciduous woodland at Fairy Glen, Rosemarkie, Sutherland East (28/729582) I recently found two shells which differ from typical A. nitidula in having the last quarter-whorl more strongly flared and compressed, in the spire being more raised, and in their darker colour. In these respects they closely resemble examples of A. nitens from the French Jura and from Germany. Positive identification of this species in Britain must await anatomical confirmation. The penis in A. nitens is larger and broader than in A. nitidula, divided by a constriction into two parts, and is much less tapered towards the distal end (for drawings see Forcart (Archiv.Moll. 88 (1959): fig. 9) and Gittenberger, Backhuys and Ripken (Die Landslakken van Nederland (1970): fig. 93)).

Any British A. "nitidula" with strongly flared last whorls should therefore be treated with suspicion and retained for dissection. Taylor (Monograph, 3 (1908): 73) gives a number of British localities for "var. nitens". A. nitens has a wide central European distribution, reaching as far north as Belgium and Holland. A. epipedostoma and A. minor are apparently much rarer species, and perhaps less likely to live in Britain, but both have shells which resemble A. nitens very closely. Their anatomy is also figured in the paper by Forcart mentioned above.

M. P. Kerney

NOTES ON VITREA SUBRIMATA REINHARDT IN YORKSHIRE

On Sunday the 14th. of April 1974 Dr. Adrian Rundle and I examined two areas in the Yorkshire Dales with the intention of collecting specimens of Vitrea subrimata Reinhardt for our relative reference collections. Due to its small size and the comparative difficulties of identification in the field we decided to collect every Vitrea we could with the intention of trying to establish the ratio of one species against the other.

The areas examined consisted of limestone scree below Ivy Scar east of Askrigg in Wensleydale (NGR 34/988902), and a large group of stones below a limestone kiln near Fleet Moss 4 miles south of Hawes (NGR 34/861841), on the high pass between Wensleydale and Langstrothdale, both in North-west Yorkshire.

The scree below Ivy Scar is situated at an altitude of 1,000 ft OS. and has a mixed population of Vitreas which includes V. crystallina (Muller). The general molluscan fauna is comparatively rich for this type of habitat and includes such species as Abida secale (Drap.), Carychium tridentatum (Risso), Pyramidula rupestris (Drap.), Vertigo pygmaea (Drap.), Lauria cylindracea (da Costa), Marpessa laminata (Mont.), Clausilia bidentata (Strom), Punctum pygmaeum (Drap.), Euconulus fulvus (Muller), a typical scree population. The Fleet Moss locality at 1,900 ft OS. is nearly twice the altitude and has a very limited molluscan fauna, of those listed above, only P. rupestris occurs at this station. The higher altitude and more exposed conditions combined possibly with the lack of competition from other species of mollusca seems to have benefited V. subrimata. The attached table shows the total of each species of Vitrea giving live and dead totals and percentages.

It can be seen from this that V. subrimata is by far the more common species of Vitrea at Fleet Moss being 71% of the total population of Vitreas (inclusive of dead shells). On Ivy Scar the total percentages of V. subrimata is 14% which is in line with the estimated populations at other known Yorkshire sites. The very low percentages of live material against dead, 6% subrimata against 3% contracta at Fleet Moss and 3% subrimata against 13% and 9% contracta and crystallina at Ivy Scar may indicate the relatively long period of time it takes to destroy the shells in what are lime saturated soils.

A. Norris, Leeds City Museums

TABLE SHOWING TOTAL NUMBERS OF VITREA

FLEET MOSS	<u>subrimata</u>	<u>contracta</u>	<u>crystallina</u>	TOTALS
Dead	52	21	-	73
Live	5	2	-	7
Percentages				
Dead	65%	26%	-	91%
Live	6%	3%	-	9%
Total percentages	71%	29%	-	100%
IVY SCAR				
Dead	19	100	16	135
Live	5	23	13	41
Percentages				
Dead	11%	57%	9%	77%
Live	3%	13%	7%	23%
Total percentages	14%	70%	16%	100%

RECORDING MARINE MOLLUSCS FROM THE GOWER COAST, SOUTH WALES, 1974

A successful weekend field meeting to the Gower coast was held in May 1974. The party was based at Oxwich Bay where the old schoolroom was available (through the kindness of the Nature Conservancy Council) as a study area for evening work.

The first day was spent in Oxwich Bay. Some of the party examined the strand-line and sands of the bay, others concentrated on the rocky headland to

the south (including some diving activities) and a smaller group looked at the land snails of the Oxwich sand-dunes and Oxwich Wood (a deciduous wood on a limestone slope by the church). The intertidal sands of Oxwich Bay were well covered with shells which suggested the abundance of molluscs in the vicinity.

The second day was spent at Rhossili where the party divided between the sandy shore of the bay and the rocky shore near the Worms Head causeway. The weather conditions were particularly adverse with persistent rain and low temperature and offshore the waters were too turbid for the divers to see very much. However, in spite of the conditions a reasonable list of molluscs was made and towards the end of the afternoon the party returned to the old school-room to dry out and to examine the results of the collecting.

J. E. Chatfield and T. E. Thompson

Results of the collecting on the Gower, May 1974

1. Land snails

11 May 1974 at Oxwich Bay.

(a) On an old limestone wall:-

Pyramidula rupestris, Lauria cylindracea, Helix aspersa, Arion ater agg, Hygromia striolata, Clausilia bidentata, and amongst grass at the base of the wall:- Arianta arbustorum, Cochlicopa lubrica, Discus rotundatus, Arion intermedius, Hygromia hispida, Vitrea crystallina, Oxychilus alliarius, Cepaea nemoralis.

(b) in Oxwich Wood (sycamore and ash):-

Vitrina pellucida, Arion intermedius, A. circumscriptus, Discus rotundatus, Retinella nitidula, Lauria cylindracea, Carychium tridentatum, Euconulus fulvus, Lehmannia marginata, Pomatias elegans, Arion subfuscus, Marpessa laminata and Limax maximus. A bag of leaf litter revealed:- Cochlicopa lubrica, Discus rotundatus, Vitrina pellucida, Retinella nitidula, R. pura, Carychium tridentatum, Acme fusca, Vitrea contracta and Acanthinula aculeata.

(c) the Oxwich dunes, amongst marram grass:-

Helix aspersa, Cepaea nemoralis, C. hortensis, Helicella virgata, H. caperata and a dead shell of Cochlicella acuta.

12 May 1974. Grass on cliff above Worms Head, Rhossili.

Cepaea nemoralis, Cochlicopa lubricella, Retinella nitidula, Oxychilus alliarius, Clausilia bidentata and Helix aspersa were found in the car-park.

2. Marine molluscs. (A = alive, B = freshly dead shell and bivalve with 2 valves joined, C = worn shell)

Oxwich Bay (21/5--/8--)

Chitons: Lepidochitona cinereus (A); Prosobranchs: Aporrhais pespelecani B, Buccinum undatum agg B, Calliostoma zizyphinum B, Clathrus clathrus C, Gibbula cineraria A, G. umbilicalis A, Littorina littoralis A, L. littorea A, L. neritoides A, L. saxatilis agg A, Nassarius incrassatus B, N. reticulatus B, Natica alderi B, N. catena B, Nucella lapillus A, Ocenebra erinacea B, Patella vulgata A, Patina pellucida B, Rissoa parva agg A, Trivia arctica B, T. monacha B.

Sea-slugs:- Acteon tornalis agg B, Coryphella pedata A, Doto coronata A, Eubranchius exiguus A, Philine aperta A, P. quadrata B, Polycera dubia A, Tritonia hombergii A.

Bivalves:- Abra alba B, A. tenuis B, Acanthocardia echinata B, Anomia ephippium B, Arctica islandica C, Barnea candida B, Cardium edule agg A, Chlamys distorta B, C. opercularis B, C. varia agg B, Corbula gibba A, Donax vittatus B, Ensis arcuatus B, E. ensis B, E. siliqua B, Gari depressa B, G. fervensis B, Hiatella arctica B, Laevicardium crassa C, Loripes lucinalis C, Lutraria lutraria B, Macoma balthica agg A, Mactra corallina A, Mya arenaria B, M. truncata C, Mysia undata A, Mytilus edulis agg A, Nucula nucleus C, N. turgida agg C, Ostrea edulis agg B, Pharus legumen B, Scrobicularia plana B, Solen marginatus B,

Spisula elliptica C, S. solida B, S. subtruncata C, Tellina fabula B,
T. squalida C, T. tenuis A, Thracia phaseolina agg B, Venerupis discussata B,
V. pullastra A, V. saxatilis A, Venus striatula A.
Cephalopods: Sepia officinalis agg B.

Rhossili Bay and Worms Head causeway (21/4--/8--)

Prosobranchs: Buccinum undatum A, Calliostoma zizyphinum B, Cerithiopsis tubercularis C, Clathrus clathrus B, C. turtonis B, Colus jeffreysianus B, Gibbula cineraria A, G. umbilicalis A, Littorina littoralis B, L. littorea A, L. neritoides A, L. saxatilis agg A, Nassarius incrassatus B, N. reticulatus B, Natica alderi A, N. catena A, Nucella lapillus A, Ocenebra erinacea A, Patella vulgata A, Patina pellucida B, Tornus subcarinatus C, Trivia arctica B, T. monacha B.

Sea slugs:- Acteon tornalis agg A plus spawn of one of the nudibranchs in a rock pool at the causeway.

Bivalves:- Abra alba B, A. tenuis B, Acanthocardia echinata B, Barnea candida C, Cardium edule agg A, Chlamys distorta C, C. varia B, Corbula gibba B, Donax vittatus A, Dosinia exoleta B, D. lupinus B, Ensis arcuatus B, E. ensis B, E. siliqua B, Gari fervensis B, Glycymeris glycymeris C, Lasaea rubra B, Lutraria lutraria B, Macoma balthica agg A, Mactra corallina A, Mya arenaria B, M. truncata B, Mysella bidentata agg B, Mytilus edulis agg A, Ostrea edulis agg C, Pharus legumen A, Scrobicularia plana B, Spisula elliptica B, S. solida A, Tellina fabula A, T. tenuis A, Venerupis decussata B, V. pudastra B, Venus striatula A.

A FURTHER WEEKEND FIELD MEETING ON THE GOWER, SOUTH WALES

Leaders: Drs. T. E. Thompson and J. E. Chatfield

Over the weekend of 28-29 September 1975 we intend to revisit the Gower coast to consolidate on collecting from the field meeting in 1974 and to explore new sites in the north of the peninsula. It is proposed to base the weekend at Rhossili and to spend the first day there. This is a very rich habitat and merits further study. On the Sunday we should like to visit sites in the north and possibly to visit the famous Llanrhidian cockle fishery where local cockle fishers go to the beach each day with their traditional horses and carts.

Further details available from:- Dr. June Chatfield, Zoology Department, National Museum of Wales, Cardiff, CF1 3NP (please send stamped addressed envelope).

REPORT ON MEETING OF NATIONAL BIOLOGICAL SOCIETIES

AT JUNIPER HALL FIELD CENTRE, DORKING, SURREY

A meeting of representatives of National Biological Societies was held at Juniper Hall Field Centre on 1 February 1975. The Conchological Society was represented by Drs. J. E. Chatfield and M. P. Kerney. The meeting began with reports on various matters arising from the 1973 meeting. It was reported that some money from the "Petfood Fund" for study of rare or endangered species was still available. Application forms from:- Petfood Fund, Nature Conservancy Council, Cambridge Gate, Regents Park, London, N.W.1.

Members of this Society may be interested in the new 'coastal code' produced by NERC. These are available free from:- National Environmental Research Centre, Alhambra House, 27-33 Charing Cross Road, London, WC2H OAX. Teachers and lecturers in the Society may find them useful in fieldwork with school or student groups.

The morning concluded with a most interesting lecture by Lt. Col. N. Clayden on "Nature Conservation and Recording on Ministry of Defence Lands". Lt. Col. Clayden is responsible for liaison with all conservation authorities on the wildlife of all Ministry of Defence lands and he works closely with the Nature Conservancy Council. Some of the service men on these sites are involved in conservation work and some have set up committees concerned with wildlife.

Lt. Col. Clayden is anxious to assemble as much information as possible on the flora and fauna of MoD land and is therefore willing to grant access permits

to biologists and small groups to work an area. He can provide contact with the service authority and site land agent. Amongst some of the sites listed, several could be (two definitely are) of conchological interest and it would be useful to follow up this lead in future field meetings. One meeting has already been held on MoD land at Porton Down. (See Conchologists' Newsletter No. 34 (1970):170.

In the afternoon there were three reports by the Biological Records Centre. Diana Scott gave an account of progress in computing at the BRC. She reported a pile-up of work with several atlases reaching their final stage; our own Snail Atlas will be the next to be published. The Experimental Station have recently acquired a small computer which will save considerable time in doing small tasks compared with the former reliance on a computer outside the station. The new computer will be useful in changing grids of records e.g. from latitude and longitude to National Grid and vice versa. Other computer programmes are being prepared to deal with habitats and abundance.

Mr. John Heath then gave a review of Biological Recording in Europe, particularly the European Invertebrate Survey (see the report on the 1974 Malacological Congress in Milan in Conchologists' Newsletter No. 52, March 1975).

The final report was by Frank Perring on Biological Recording in Britain. He reported progress in Scotland with a congress in Dundee in mid-April this year to which our Marine Recorder, Dr. Shelagh Smith, contributed.

The meeting concluded with tea at 4 p.m. and useful informal discussion amongst the participants.

June Chatfield

PUBLICATIONS RECEIVED

'POIRIERIA', organ of the Conchology Section, Auckland Institute and Museum, New Zealand. Vol. 7, Part 5, Oct. 1974.

The issue received upholds a high standard. Reproduced in typescript, as befits a comparatively small circulation, it contains material of considerable value to the amateur and the illustrations are carried out with more than adequate competence.

N. W. Gardner reports on the discovery of a species of Hipponyx, new to New Zealand, in dredgings near the Poor Knights Islands. It is similar to H. foliaceus Q. & G. which was described from New South Wales, but which is unlikely to survive so much further to the south. Another article reviews the local sub-species of Lepsiella, a common boring mollusc.

There is no reason why a lengthy article on Australian snails should not appear in a New Zealand journal, and L. Price contributes a report of a safari through the area between Perth and Albany, about 6,000 miles being covered in a quite successful search for land mollusca. As may be expected, the elements were largely against the adventurers, but some very interesting species were collected, nevertheless. By contrast, I. Rigden reports on a week in Fiji, devoted to collecting marine shells.

A useful feature to which all local conchologists are invited to contribute, is a collection of reports of rarities recently found with all necessary details; a permanent record of all such cases is thus assured. Cytora studeri Suter is discussed and illustrated; a land snail described in 1896 and known only by its half-grown holotype 'said to have come' from Whangarei. E.N.Gardner contributes an article on the molluscan inhabitants of mangrove swamps.

Editors: N. & N. Gardner, [REDACTED], Birkenhead, Auckland 10, New Zealand.

T.E.C.

BOOK REVIEW: "COLLECTING WORLD SEA SHELLS" BY ALAN MAJOR
(Published by John Bartholomew & Son Ltd., Edinburgh, at £2.95)

This is a well-produced book of a useful size - approximately 5½" x 8½" -

which will fit easily into the average bookshelf, and the pages are of good quality paper which are a pleasure to turn. This probably accounts for the somewhat high price, but the enthusiastic collector, who is just beginning to collect shells from Britain, the Mediterranean and perhaps the USA, will not be wasting his money. This book, with its clear and detailed explanations and concise text, is extremely well illustrated by Barbara Prescott with excellent line drawings, and the author shows us quite plainly how to identify every part of the shell. It is to be regretted that these drawings do not vary in size and that quite large shells are placed next to much smaller shells without any indication of the scale, although sizes can usually be found in the accompanying text. For example, on p.111, Haliotis cracherodi Leach is shown next to the same-sized Haliotis tuberculata L., yet the first is twice as large as the second. On p. 136 Trivia pediculus L., $\frac{1}{2}$ " long, is nearly the same size as Cypraea cervus L., which grows up to 7". And even more startling, on p.166 we see Charonia variegata L., up to 18", looking the same size as Cymatium muricinum Röding. Numerous examples could be cited.

There are also some serious errors. Murex radix Gmelin quite properly drawn and described on p.164, is shown in a colour photograph facing p.49 in the guise of what seems to be Murex chicoreus Gmelin. And on p.128 we have a very rare left-handed version of Littorina scutulata Gould.

As the author is so helpful in putting beginners on the right road to shell collecting, I feel it is a great pity that he does not mention that all Latin names should be followed by their authors; he does not include these in the text himself.

In spite of these criticisms, I recommend this book to all new collectors (and even to some of us who think we know quite a lot), especially if their interests are world-wide. The American bias of the book could be quite useful as it is relatively easy to find an exchange contact in the many flourishing American Shell Clubs.

H. H. E. Nash

GENERAL NOTES

Mollusca of Lake Garda - a correction

In Newsletter No. 52 (1975): 421, I recorded Unio mancus and Anodonta complanata collected on an excursion to Lake Garda during the UME congress last September. I have since sent specimens of these bivalves to our member M. M. Lambiotte, of Waterloo, Belgium, who has authoritatively identified them as Unio elongatulus C. Pfeiffer and Microcondylaea compressa (Menke) respectively. M. Lambiotte is engaged on a revision of the European Unionidae, and has just published a useful key to the species (Informations de la Societe belge de Malacologie, series 4, No. 2 (1975): 33-36).

M. P. Kerney

The Society's Publications

Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19 (telephone 01-771 9719) at 25p each, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, 30p to members and 50p to non-members, and can take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

DRIVE FOR INCREASED MEMBERSHIP

As part of the Society's Centenary activities in 1976, we are keen to obtain more new members. This is very much in everyone's interest, since an increased membership will produce more income and will help to postpone the time when the Society may be forced to raise the subscription to meet the ever-rising cost of postage, printing, stationery, etc... So please do all you can to make the Society's activities known and to introduce prospective members whenever possible. The Centenary next year provides an excellent opportunity.

FIELD MEETINGS ORGANISER

Members requiring information about field meetings or needing to make last-minute arrangements may find it convenient to telephone Mr. T. Pain - [REDACTED], Monday to Friday between 6 p.m. and 10 p.m.

SALE OR EXCHANGE

Mr. Jens Mansson, [REDACTED], S-271 00 Ystad, Sweden, wishes to sell, or preferably exchange, a collection of about 80 land and freshwater molluscs. Anyone interested can obtain a list of the collection and should indicate what they can offer in an exchange.

Mr. E. C. Clamp, [REDACTED], Selsey, Chichester, Sussex, wishes to exchange Cypriot shells for good species from other areas.

Mrs. Amy E. Cox, [REDACTED], Brierley Hill, West Midlands, [REDACTED], wishes to sell 4 parts of the Journal of Conchology, Vol. 28, 1, 2, 3 & 4, at £1.00 each plus postage. Also Conchologists' Newsletter Nos. 46, 50 & 51, free on payment of postage.

Virginia A. Vail, a research biologist, Tall Timbers Research Station, Route 1, Box 160, Tallahassee, Florida 32303, U.S.A. is anxious to obtain European Viviparidae (suitable for gross dissection and histological examination as well as for shell characters) in exchange for North American molluscs, especially Florida freshwater and marine specimens. Can anyone help please?

SHELLS FOR SALE

A fine selection of shells for the collector is available at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (Telephone 01-437 9391).

FIELD MEETINGS 1975

Please note the following alterations and additions to the field meeting arrangements as printed on the Programme Card.

Sunday, July 6th. Sandwich, Kent. (Joint meeting with the Kent Field Club)

Saturday, August 8th. Folkestone to Hythe, Kent. (Census collecting in Sea Area 14)

Saturday 13th. - Gedgrave, Suffolk. (Joint meeting with the Geological Society of Norfolk, Tertiary Research Group and the Ipswich Geological Group)

All other meetings are as shown on the 1975 Programme Card.

Those requiring further details, please send a S.A.E. to T. Pain, [REDACTED], Millbank, London, [REDACTED], or telephone [REDACTED] after 18.00 Monday to Friday.

T. Pain, Field Meetings Organiser

A. E. ELLIS

We are very pleased to announce that Mr. Ellis has recently received the 'Stamford Raffles' award for high excellence of work as a non-professional in the field of Natural History. He was presented with a beautifully engraved silver dish. Congratulations to A.E.E.

Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

OYSTERS

An Address given to the Cheltenham Rotary Club on March 4th. 1975,
by Wilfrid M. Appleby

According to Lewis Carroll, the Walrus and the Carpenter invited the Oysters for a pleasant walk along the beach:

Four young oysters hurried up
all eager for the treat,
Their coats were brushed, their faces washed,
Their shoes were clean and neat -
and this was odd, because, you know,
They hadn't any feet!

Well, there are many odd things about oysters, and many kinds of oysters. Some are edible, others provide pearls, and also nacre or 'mother-of-pearl'. Together with some of their cousins, oysters present a fantastic range of appearance, from shells resembling a hammer, the wing of a bird, chrysanthemum, jewel-boxes, - to shells so nearly transparent that they were used in Asia for windows. Then there are oysters which clip themselves onto coral-stems and others which fasten themselves to the lower branches of trees. Oysters are bivalves. They have two shells, or valves, joined by a ligament-hinge, and they have been like that for about 400 million years.

Compared with the exotic species, our Native British oyster, Ostrea edulis is rather grey and flat. Nevertheless, this succulent bivalve saved our reputation in the year 50 B.C. when a snooty Roman wrote of us: "Poor Britons - there is some good in them after all - they produce an oyster". The 'edulis' oyster is not exclusively British, but ranges from Norway to Morocco, through the Mediterranean to the Black Sea. Sometimes other kinds of oysters have been imported in their juvenile state to be reared and fattened for British oyster-lovers. The Portuguese oyster, 'Angulata', has occasionally bred here. But this irregular box-like mollusc is liable to disease, and has been dropped by the industry. So has the 'Blue Point' oyster, 'virginica', of the East Coast of America.

The native oyster of the West Coast of Canada and U.S.A. ('Lurida' by name and green inside) was very small, about 2". So in 1899 the first attempt was made to introduce in the U.S.A. the largest of the 15 kinds of Japanese oysters. This is called 'gigas' = a giant. It grows to about 10 or 12 inches long, being narrow and strap-like. But in those days, before aviation, the journey took up to a fortnight and the oysters died on the way. This happened many times. In 1919 another attempt was made but the dead oysters were dumped in shallow water. A few years later, it was discovered that a flourishing bed of 'gigas' oysters had grown up from the 'spat' on the shells of the dead oysters. So now 'spat' is not only imported from Japan to U.S.A. and Canada, but also from Vancouver, Canada, to the Ministry of Fisheries Experimental Station at Conway, North Wales. There scientists are perfecting techniques both in the hatchery and in the sea, for the improvement of the Pacific oyster and other edible bivalves. The advantages of the Pacific Oyster, apart from its size, are that it can be eaten all the year round, even when there is no 'R' in the month, and that it matures in two years. Our British oyster requires about five years, and is generally considered superior in taste, though the pacific oyster is excellent for serving cooked. Burnham River Company has published a book giving 50 ways of cooking oysters. It includes such

dishes as 'Angels-on-horseback', 'Pigs-in-Blankets', etc.. The U.S.A. "Oyster Book", by a famous chef, contains 266 recipes. When oysters are eaten raw, a few drops of lemon juice or a glass of chablis wine are appropriate diatetically.

Now a few words about the life-story of the oysters. Some oysters, such as the Blue Points of Eastern America, always begin life as a male! After the male Blue Point has sown his wild oatmeal (or sperm), he changes into a female for the rest of its life, spawning her eggs straight into the sea. So all young Blue Point oysters are the offspring of young daddies and old mummies! Our British native oysters are much more enterprising. They change sex several times a year! In springtime the males launch their sperm into the sea, but the females, with finer maternal instinct, lay their eggs and store them in the lattice-work of their gills, (known to oyster-eaters as 'the beard'). Through the gills sea-water is wafted by microscopic hairs. With the water comes oxygen for breathing, algae for food, and sperm to fertilize the eggs. These will hatch out into larvae, and grow to almost double their size after a week or so in their mother's gills. Then Mrs. Oyster will give an almighty sneeze and spit them all out into the sea - about a million of them! Now known as veligers, they swarm in the sea like a cloud, the prey of many hungry creatures. Few things in nature provide so much food for so many appetites, as does the oyster in its various stages! By means of its velum, a sort of water-wings, the veliger swims up and down and about in the sea. In a week or two it will be three times its original size, and new features will have been formed.

It now has a mysterious crystalline 'style' (a gelatinous rod) which lies in its stomach and, together with the stomach, revolves rapidly - a sort of rotary stomach! When the oyster dies, this 'style' will disappear - dissolve. The veliger also grows a temporary foot, a temporary pair of eyes and a supply of seccotine, just enough to fix itself to a piece of cultch, such as a shell, on the sea-bed. That done the velum is discarded, together with its foot and eyes. It has had enough of travelling and hopes to stay put for about five years! Unlike the scallop, the oyster cannot swim by clapping its shells. If it becomes detached, it is at the mercy of tides and currents. It may even go on living upside down!

To return to the veligers, at this stage about 90% of the original larvae will have perished, and only about one in ten thousand is likely to fix itself on to the sea-bed cultch. Actually, in nature, only approx. 5 or 6 oysters out of each million eggs are likely to reach maturity! Our house-bound veliger is now known as a Spat - a tiny shiny disc on an old shell or stone. The most important equipment which it has retained from its larval stage is its magical MANTLE. Sea-water, all over the world, contains one per cent of calcite. The mantle uses this calcite to make, enlarge and repair the shell, which is the oyster's only protection against its many enemies. The oyster is amazingly complex, much more so than a watch!

Our British oyster's 'million eggs at a time' seems a lot, but some kinds of oysters lay 60 to 100 million eggs at one spawning. If all these oysters survived and bred, the world would soon be choked with oysters, so it is just as well for mankind, and the other creatures, that oysters have such a fantastically high infant mortality. But, in the world, there are millions of hungry and starving people - and oysters are rich in protein. It seems a pity to let so many of their off-spring literally 'go to feed the fishes' when, by scientific planning, at least some could be saved. Two thousand years ago, the Romans cultivated oysters in Lake Lucrino. Such scientific planning is now known as Aquiculture or Mariculture (in the American language!) For instance: One acre of good pasture can produce 200 lbs of beef in a year. But one acre of good mussel beds produces ten thousand pounds weight of protein meat a year. (I do not have the figures for oysters - but this gives some idea). There are oyster-beds and oyster industries in many creeks and estuaries of the British coasts, but the geological strata known as the London Clay which extends along the coasts of Essex and North Kent is claimed to have special qualities for producing particularly fine oysters. Moreover, the craft of oyster-culture has been practised there for many centuries. In North Essex on the river Colne, some ten miles from Mersea Island, and the North Sea, the Romans built CAMULODUNUM, now known as Colchester, the oldest recorded town in England. Colchester is the 'spiritual home' of the Native oyster,

especially the ~~Pyefleet~~ Oyster bred in the isolated Pyefleet Creek which lies between the estuary of the Colne and the Roman causeway, known as the Strood, which links Mersea Island with the Essex mainland. At very high tides, the Strood is covered - and there have been tragedies. The ghost of a Roman Soldier is said to haunt this lonely spot - was he after oysters when the tide overwhelmed him? The Pyefleet Native Oyster is acknowledged as the King (or Queen) of Oysters - and fetches the highest prices in London, Paris and elsewhere.

In 1189, King Richard I granted a Charter to the Corporation of Colchester confirming its rights to the oyster industry in the Colne and its creeks - (to quote) "as enjoyed from time immemorial". The Mayor of this town wears a silver oyster in his regalia and no Colchester oyster may be sold which is smaller than this standard size. My parents were Colchester people, so I lived in the old town until I was 17 years old. I know Mersea Island, where the oystermen and their families were my friends - even going to sea in their smacks. Moreover, our family doctor for three generations was Alderman Dr. Henry Laver, Chairman of the Colne Fisheries Board, with its important industry of Oyster Culture. He was a wonderful man, archeologist, naturalist and conchologist, a former Mayor of Colchester and a great authority on Oysters. His book is a 'must' for those interested in the subject.

The poor oyster is rather a defenceless sort of creature. It has no head, no eyes, no ears, no nose, no legs. It is quite harmless with neither sting nor teeth. The only case of an oyster being reported to have killed anything was a mouse which, supposedly, entered the wrong hole. Predators on the oyster include the starfish, sea-urchin, barnacles, sponges and other marine creatures. The most deadly pests came from America with imported Blue Point oysters (1) the whelk-tingle which bores through the shell or sucks out the oystermeat and (2) the slipper-limpet (*Crepidula fornicata*), which does not attack the oyster but takes its food and smothers it with the great masses of its shells. They live one on top of the other in piles or chains of up to 10 or even 14. On the crowded seafront at Bournemouth I called out to my wife that I had seen quite a lot of 'fornicatas', on the beach. A matronly lady gave me such a look! But far worse enemies than even the whelk-tingle and 'fornicata' have to be faced. In 1920 an epidemic caused by parasitic infection wiped out many of the European oyster beds. Then in the winter of 1962-63, our East Coast oysters were decimated - killed by the million in the terrible iron-frost. At Colchester, the Colne Fisheries Board could no longer function, but in 1966, a new Company - Colchester Oyster Fishery Limited was granted a 42-year Lease by the Corporation. Its first year production was only 3,000 oysters but production this year should exceed a million. Of these 50% are exported to four different European countries - with help from EEC. When expertly packed, oysters will keep fresh for several days. Before the Bolshevik revolution, Colchester Oysters were regularly sent to Russia by sea. The famous Pyefleet Creek is still in use as a breeding ground for this famous oyster.

The greatest help and hope for the oyster industry comes from the Ministry of Fisheries, with its Experimental Station at Conway and its Laboratory at Burnham-on-Crouch, Essex. During the past 8 - 10 years, work has resulted in the development of commercial oyster hatcheries for scientifically-controlled oyster cultivation. Thanks to Dr. Eric Edwards and his brilliant and devoted staff of scientists, there are now six special hatcheries. During 1973, these scientists issued more than 40 papers and leaflets giving valuable information on problems connected with edible shell-fish. Also at Burnham-on-Crouch, the old-established oyster industry has been given new life by the Formation of the Burnham River Company which breeds the Royal Burnham Oyster and the Pacific Oyster.

At Whitstable in North Kent, one of the greatest centres for oysters began to decline as a result of over-fishing in the early part of this century. Also, there was pollution in the River Swale estuary, which was the nursery for the larvae of the oysters. One of the six new hatcheries has been built there, and is already supplying young (seed) oysters to other oyster companies. It is hoped to re-stock the Whitstable oyster grounds in a few years. The newly-introduced Pacific oysters are responding particularly well to scientific breeding. There are two active companies at Whitstable. Seasalter Shellfish Limited and Whitstable Oyster Fishery Company.

It is extraordinary that in the days of Dickens and earlier, the oyster was largely the food of the poor. Sam Weller always associated oysters and poverty. Costermongers sold oysters from their barrows in the streets of London at four-a-penny! Oysters may have saved our reputation as Britons in Roman times, but in the population explosion following the industrial revolution, the good old oyster, so rich in protein and easy to digest, saved thousands of British lives. Of course, that ties-up with the 'over-fishing'. So the oyster became scarcer and a luxury. It was "Champagne and Oysters for the rich"!

The British Oyster industry has been through a difficult period, but it is bravely facing the future with scientific knowledge and improved equipment. We have a splendid native oyster, and the Pacific oyster comes as a useful complement to it. To balance increasing supplies, there should be a growing market. Our oysters should not be too dear, nor too cheap, but good food, nutritious and delicious, at reasonable prices for all.

BIOREC 75 CONFERENCE ON BIOLOGICAL RECORDING IN SCOTLAND

This conference was held in Dundee University, 11-13 April 1975. It was jointly sponsored by the Biological Records Centre Monks Wood, Dundee Museum, Glasgow Museums and Art Galleries, the Nature Conservancy Council, the Royal Scottish Museum and the Scottish Wildlife Trust.

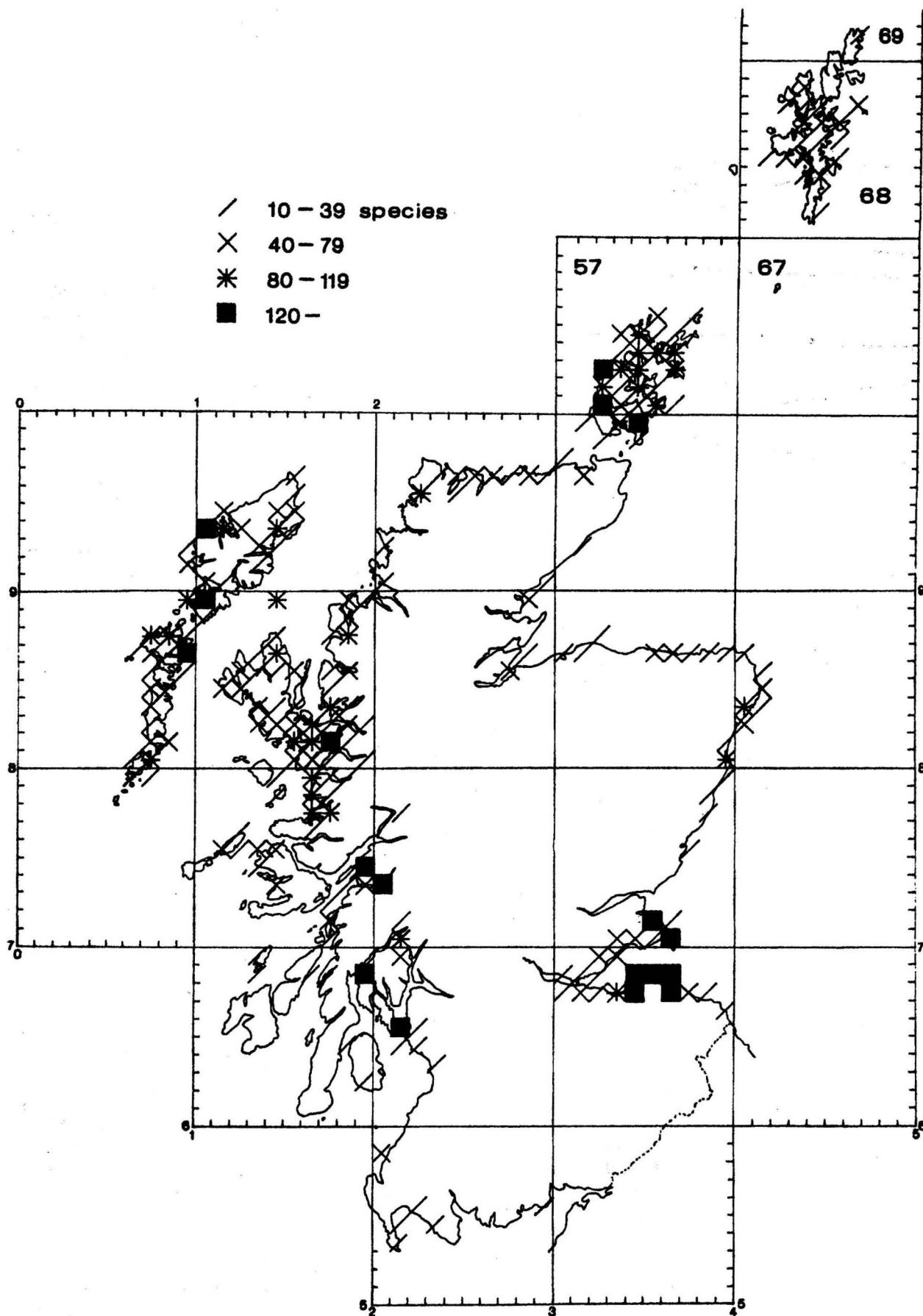
Major topics discussed included the importance of records as a pre-requisite to ecological evaluation, and providing a base line for monitoring the status and distribution patterns of species; a review of the types of recording schemes; methods of recording; a demonstration of the methods by which records have been collected on the regional level by the National Museum of Wales with emphasis on field courses; the bringing together of local records.

Out of these there was discussion centering on snags and dissatisfactions so far encountered. These could be categorised as general lack of communication; the imbalance of recording effort as regards distribution of recorders, a human predilection towards the obvious and pretty and a bias towards rarities; the position of the amateur.

The meeting proved a great success, with persons present representing most aspects of land recording and land use (countryside) in Scotland. Marine interests were, unfortunately, only put forward by a very vociferous minority from the Conchological Society who expressed opinions on most topics. Stewart Angus from Stornoway representing the Outer Hebrides Areas seconded an Orkadian proposal that recording logistics suitable for England where there are plenty of people and relatively short distances to be covered are totally unrealistic for the far-flung outposts. David McKay from Aberdeen (Department of Agriculture and Fisheries for Scotland) personified offshore recording and showed that this is also something very different from that pertaining to inland populated regions. I gave a brief report on Marine Mollusc recording in Scotland (with a word on non-marine mollusc recording), showing that despite an acute lack of manpower an amazing amount of progress is being made. I had an exhibition stand showing the methods we use (Information sheets, cards supplied by the Biological Records Centre, a copy of the Concordance, copies of Master Cards for the major Scottish Areas, etc.) and the results in map form, one of which is reproduced here. This map shows an embarrassing gap around Dundee which engendered discussion about what could be done. Adam Ritchie of Dundee Museum is setting up a very comprehensive local recording centre for the county of Angus (as was) and we can rely on his support.

The most important aspect of Biorec was the stimulation of interest and exchange of ideas concerning the way ahead. This clearly will, for the less popular disciplines, molluscs included, be bedevilled by lack of money.

It is hoped that the excellent intentions and lack of self-congratulation developed during the conference will not prove to be just so much euphoria and to that end future possibly biennial meetings are planned for Scotland. I hope that if these take place marine interests will be more widely represented and that marine recording will not be so obviously out on a limb. There was



MAP OF SCOTLAND
 showing the number of species of marine Mollusca recorded to January 1975
 for each 10km. coastal square of the British National Grid. All records.

blanket criticism of all the national societies and recording schemes for being too 'London based'. Better work could be accomplished if more meetings were held outside London and the disinclination of 'Londoners' to travel was disregarded. It was thought desirable that field meetings covering more than one discipline should be encouraged, both for cross-fertilisation of ideas and to make better use of resources where special transport and accommodation arrangements are necessary (remote areas).

I have received a number of useful suggestions valid for the whole of Britain which I hope can be acted upon within the not too distant future. These centre around ways and means to improve inter-Area communication and the general communication of information apart from records.

The grid problem seems to have been resolved for the time being. The unsuitability of the National Grid for offshore work is recognised and any co-ordinates can be accommodated by the Biological Records Centre - at least until there are too many offshore records for stations to be plotted individually.

Methods of retrieval of information were demonstrated by Dr. Perring. As yet they do not apply to marine molluscs since Monks Wood are not ready to accept our records. We have to do more paperwork first. However, once this stage is reached, and it must be reached this year, much more effective distribution of information will take place. A provisional date for a Marine Mollusc Atlas has been set and to that end I would like to encourage a big effort ready for 1977.

Shelagh Smith, Marine Recorder

P.S. Please note that all future correspondence should be addressed to me at Natural History Department, Royal Scottish Museum, Chambers Street, Edinburgh, EH1 1JF

PESTALOZZIAN CONCHOLOGY

"Shell univalve, spirally convoluted, sub-diaphanous, thin and fragile; aperture entire, contracted, sub-orbicular; body whorl generally projects into the mouth, separating the lips" (in a footnote the Greek derivation of 'diaphanous' is given).

The above is the diagnosis of the genus *Helix* (which includes, besides the Eatable and the Garden Snail, *Janthina*, *Planorbis* and *Lymnaea*) on page 104 of "Lessons on shells, as given to children between the ages of eight and ten, in a Pestalozzian school, at Cheam, Surrey, by the author of 'Lessons on objects.'" Illustrated by ten plates, drawn from nature. Published by R. B. Seeley and W. Burnside: and sold by L. B. Seeley and Sons, Fleet Street, London. 1832. 5s.6d. Pp. x + 222. 6½ x 4 inches.

The anonymous author is Elizabeth Mayo (1793-1865), sister of the Revd. Charles Mayo, D.C.L.(Oxon.), who wrote the preface. Amongst her other books are "Model lessons for infant school teachers and nursery governesses," "Religious instruction, in a graduated series of lessons for young children," "Lessons on scripture prints" and "On miracles." "Lessons on shells" went through at least three editions and "Lessons on objects" sixteen editions. Charles Mayo was the founder of a Pestalozzian school at Epsom in 1822, which moved to Cheam four years later having outgrown its accommodation.

The first part of "Lessons on shells," up to page 65, consists of nine lessons in the catechismal method, the Teacher plying the Child with searching questions to which intelligent answers are returned. Interrogation is interspersed with instruction, suitably simplified so as to be readily grasped by a child of from eight to ten years old. Thus the Teacher, in describing the shell of *Conus*,: "This channel is called a sinus, from the Latin sin us, a curved line. If the two lips be separated by a sinus, liquid poured in overflows before it reaches the lips; the aperture in this case is called effuse, from the Latin fus us, which signifies poured out. You have no doubt heard the term effusion applied to the overflowing of any liquid; you now know

exactly what such an expression means." Later, in "Remarks on the shell and its inhabitant," the Child is told that "The section of a cone displays a fact very interesting, as it illustrates the singular habit of its inmate; it is, that the concealed internal convolutions are of a much thinner substance than the external coating, and it is supposed that this difference is made by the animal's absorbing some of the calcareous matter of these convolutions. The end to be answered by this process is probably, that the weight of the shell may be lessened, without diminishing the solidity and strength of its bulwarks: and if so, it affords a beautiful instance of the superintending providence of God, who by the instinct he implants, directs the habits of the animal kingdom." Not to be intimidated, the Child comes back with: "The name *Conus* would recall the idea of a univalve shell, whose form is inversely conical and turbinate; the spire retuse; whorls spirally convoluted, aperture linear, longitudinal, entire, effuse at the base; its columellar lip smooth, having sometimes a few oblique rugose striae towards its base."

After page 65, "the substance only of the lessons will now be given for the use of the Teacher, who, it is supposed, will analyse it and arrange it in questions according to the plan of the foregoing lessons." Some three dozen genera are then described with a few examples of each. *Terebratula*, *Serpula*, *Sabella* and *Lepas* are included, the last together with *Pholas* and *Chiton* constituting the class Multivalves. The text is embellished by two poems, one on the limpet (author not stated) and the other on *Pinna* "translated from a latin author," which describes the commensalism of mollusc and crab.

Occasional accounts of the habits and behaviour mitigate the severity of the formal descriptions. By the action of a strong muscle the limpet's "shell can be brought close to the surface to which the foot adheres, or removed to a distance. By means of this instrument, the animal, when desirous of changing its situation, sometimes effects a considerable leap." "Few objects can be conceived more interesting than" *Argonauta* "seated in its pearly little vessel; two tentacula erected, with their membrane unfurled like a sail, whilst the remaining six, suspended over the sides of the little bark, perform the office of oars. When wafted by propitious gales, it calmly rides over the waves; but should a storm threaten, or an enemy approach, it precipitately hauls in its tackle, shrinks into its shell, and drawing in water to add to its weight, seeks protection in the depths of the sea." The shell of *Anomia* is "thin, fragile, delicate, and would be ill-fitted to contend with the dangers of their dwelling in the boisterous ocean, had not He who placed them amidst its perils, exercised his compensatory providence, and anchored them securely in its depths." Welsh farmers summon their labourers with a *Buccinum* trumpet "and the deep and sonorous notes produced breaking in upon the silence of those mountainous districts have a very striking effect." In America "The public streets of Christianstadt and Santa Cruz are paved with *Strombus Gigas*, and the town of Conchylion is entirely built of marine shells."

Scientific names are followed by English names. The reader may conjecture to which species the following apply: Savage Clam, Thorny Woodcock, Hoof-shell, Bleeding Tooth, Crosier Nautilus, Paper Sailor, Simpleton's Kneading-trough, Cat's Paw, Bear's Paw Clam, Antique Lamp, White Stone Piercer, Wood Dipper, Stream Dipper (you will never guess this one), Weaver's Shuttle, Spotted Tun, Triangular Helmet, Staircase Shell, Tiger Spire, Zebra Shell (not *Dreissena*).

A. E. Ellis

REPORT ON AN RAF SUB-AQUA ASSOCIATION EXPEDITION TO RAF GAN, MALDIVE ISLANDS

Two officers and an NCO of the RAF Sub-Aqua Association accompanied two scientists of the British Museum (Natural History) on a sub-aqua expedition to RAF Gan, Maldive Islands from 20 April 1974 to 4 May 1974.

The expedition embarked with the following aims:-
to instruct and demonstrate to RAF divers the methods of carrying out scientific surveys, sampling, collecting and preservation techniques, on both molluscs and corals endemic to Addu Atoll:

to initiate what it is hoped will become a continuous process at RAF Gan whereby divers will survey, collect samples, and forward results to the British Museum (Natural History):

to establish a reference collection of corals to enable future identification of corals to be carried out by members of RAF Gan Sub-Aqua Club:

to give lectures on coral, molluscs and reef ecology to interested members of the station, purely for recreational purposes:

to carry out short-term projects which could be completed during the time in which the expedition party spent on Gan.

The expedition was completely supported by contributions from the expedition members, who were Squadron Leader D. A. J. Taylor, HQSTC, Expedition Leader; Squadron Leader B. Pingree, RAE Farnborough, Medical Officer; Corporal A. R. N. Gray, MOD (DEMS(RAF)), Diving Supervisor; Dr. J. D. Taylor, British Museum (NH), Mollusc Specialist; Dr. B. R. Rosen, British Museum (NH), Coral Specialist.

EQUIPMENT. All diving equipment (except the RAF S-AA 35mm underwater camera) was provided by the individuals participating. The boat used was owned by the RAF Gan Sub-Aqua Club and air was purchased at normal rates at Gan.

CONCLUSIONS. This was a most successful expedition from all points of view. The beginning of what we hope will be a very fruitful relationship between the Gan Sub-Aqua Club and the British Museum (Natural History) was firmly established. A number of long-term projects were undertaken by the Gan Sub-Aqua Club and the scientists held a discussion period with the divers to outline the projects and the methods to be used in carrying them out. The Gan divers also helped in some of the short-term projects which were completed during our stay on Gan and valuable experience was gained through working with the scientists. We all enjoyed the experience of having two such knowledgeable people around and our marine biology was improved out of all proportion by the continual flow of information from the scientists.

On arrival at Gan the scientists had a number of short-term projects in mind which they were anxious to carry out during the expedition. We were able to complete all these projects and details are included in the following reports.

The scientists also gave two evening lectures in the Education Section for the benefit of interested non-divers as well as the diving members of Gan and a total of 95 people attended. An hour-long interview was also recorded for the local radio station "Radio Gan".

All underwater work involving the use of aqua-lungs was carried out by the RAF members of the expedition and the Gan Sub-Aqua Club.

Finally, the members of the expedition would like to thank all the people who helped to make the venture such a great success, particularly the following: AVM P.G.K. Williamson, Chairman of the RAF Sub-Aqua Association for his tremendous support and enthusiastic backing of the expedition throughout all stages of its planning; Gp.Capt. D. F. Moffatt, OC RAF Gan for his assistance and enthusiastic support of the expedition at Gan; Flt.Lt. S. J. Goodchild, O IC RAF Gan Sub-Aqua Club for his valuable help with numerous details; all the members of RAF Gan Sub-Aqua Club for their generous hospitality.

17 July 1974

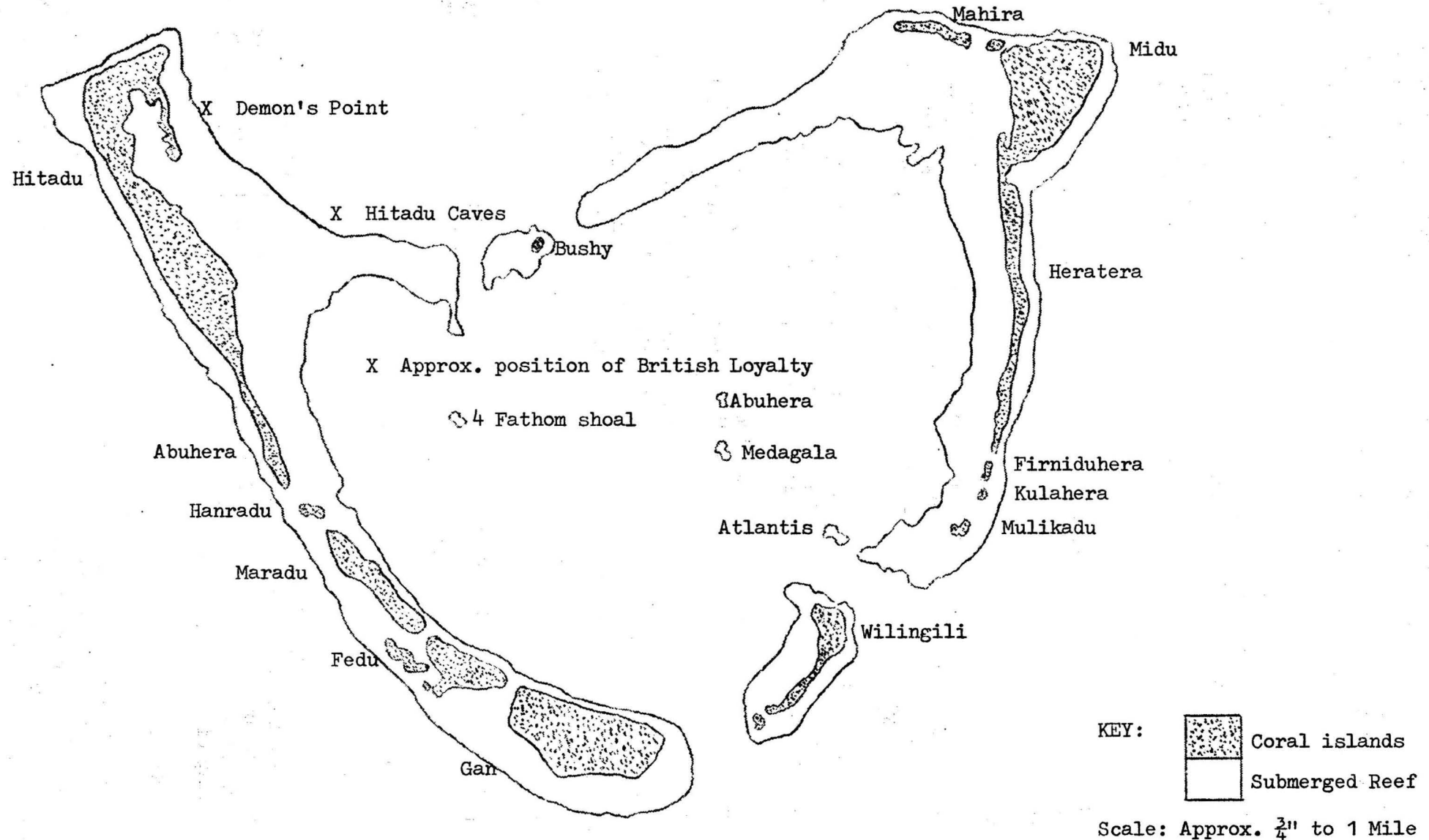
A. R. N. Gray, Corporal, Diving Supervisor

REPORT ON FIELD WORK AT ADDU ATOLL, MALDIVE ISLANDS, 21 April - 4 May 1974 -
from John D. Taylor

At the invitation of the RAF, Dr. B. R. Rosen and myself joined a small diving expedition to the RAF station on the island of Gan. On arrival at Gan we combined activities with RAF Gan Sub-Aqua Club.

The idea behind the project was that we would help the divers acquire a greater understanding of the coral reef environment around them and at the same time they would help us with research projects. It was hoped that we might also stimulate the divers into participating in long-term projects.

ADDU ATOLL



SUMMARY OF WORK

1. The divers assisted in a project observing and collecting molluscs from sub-littoral coral-rich habitats to a depth of 120 ft. These are habitats which have not previously been sampled very rigorously. Collections and observations were made at 11 different diving stations on lagoon reefs, lagoon knolls, and seaward slopes. Valuable data was obtained on the relative abundance of various taxa; the relation of species diversity to the structural complexity of the habitat and the variations in the molluscan fauna associated with the depth zonation of the corals.
2. About 200 specimens of predatory gastropods suitable for gut content analysis were collected; they comprised six species of Drupa, four Terebra and several species of Mitra, Vasum and Cypraea. This is part of a broad project investigating the diets and feeding ecology of predatory gastropods of reefs, aimed at showing how such a great diversity of species can co-exist without competitive exclusion.
3. Semi-quantitative and quantitative sampling of molluscs in various habitats on intertidal reef flats and edges was carried out. This data will be used as comparative material in conjunction with information obtained in other parts of the western Indian Ocean.
4. Special collections were made of material not well represented in the Museum collections. These were mainly in groups which show a great deal of phenotypic variation, and for which large samples are necessary for taxonomic work. These include vermetid and cerithiid gastropods, and the bivalves Chama and Spondylus.

In addition to the ecological work outlined, we gave two lectures on coral reefs at the Education Centre; an hour-long interview on Radio Gan and a discussion-meeting with the divers to discuss long term projects.

As far as I was concerned the liaison with the RAF was entirely successful and the scientific results of the expedition proved extremely valuable to my research in other parts of the Indian Ocean. I was able to obtain an objective picture of an atoll in a different climatic and tectonic setting from other reefs I have visited. The co-operation with the divers meant that I was able to achieve results otherwise impossible in such a short visit; good samples and information were obtained from habitats not previously accessible to me; the numbers of divers meant that simultaneous samples were collected from a range of depths and habitats, and I collected in a wide range of habitats (16 different sites in 10 days).

I should like to say how grateful we are to the RAF for their generosity in allowing us the opportunity of joining the expedition and for their enthusiasm in assisting the scientific work.

John D. Taylor, British Museum (Natural History), Dept. of Zoology

REPORT FROM BRIAN R. ROSEN

We left Brize Norton on the morning of April 21st. and travelled by RAF VC 10 to Gan via Akrotiri (Cyprus). We arrived at Gan in the early hours of the next morning local time. Our return was scheduled for Thursday May 2nd. but we were delayed 26 hours at Gan and did not arrive in Britain until the morning of May 4th. Thus we had 10 working days at Gan.

SUMMARY OF WORK

Services personnel, civilians working at the station and visitors like ourselves must remain on Gan itself or on a small portion of the nearby island of Hitadu. Other parts of the atoll can be seen by boat provided one does not set foot on dry land. Diplomatic clearance is required for visiting all other islands, well in advance. These circumstances restricted us to examining the reef flats only at Gan, though we were able to dive at any accessible locality elsewhere on the atoll, by anchoring the boat offshore. In this way we were able to study a substantial portion of the seaward and lagoon reef flats of Gan, the lagoon reef fronts of Gan, Fedu, Hitadu, and Bushy Island, the

seaward reef front of Hitadu, and the coral knolls in the lagoon of Medagala and Aruhal.

My own work consisted of:

1. Making observations on the morphology and coral communities of these reefs especially in the context of trying to establish broad patterns of coral ecology in the Indo-Pacific, and making a comparison of reefs in different tectonic settings.
2. Making collections of morphological series of coral specimens (often from different environments) which show intergradational characters between supposed species, especially in the genus Pocillopora, but also for Acropora and Porites.
3. Experimenting with line and quadrant surveying methods in coral communities.

These interests follow from my thesis work and previous published papers.

My reef work with the divers consisted of:

1. Helping them to make a small reference collection of corals by which they could learn to identify the more common corals.
2. Organising sample collecting dives for the purpose of trying to establish depth ranges of individual genera and species. This entailed pairs of divers collecting at agreed depths at 20 foot intervals on reef fronts, down to 120 feet.
3. Collecting small samples from a very large single Porites colony, 12-15 feet in diameter and height, in order to determine corallite variation.

From 1 and 2, I hope to obtain data on diversity-depth relationships.

RESULTS

Good coral collections were made (in accordance with the aims above). An excellent general impression of the structure and coral communities of Addu was obtained. The liaison with the RAF was entirely successful and beneficial to us, and we were given a very strong impression that this was reciprocated. The divers were interested, helpful and enthusiastic throughout, and we shall maintain contact with them. I should like to record my appreciation for the RAF initiative interest and generosity.

Brian R. Rosen, British Museum (Natural History), Dept. of Palaeontology
(Coelenterata & Bryozoa Section)

SUMMARY OF DIVING EFFORT

1. The table below shows the number of individual dives to the depths stated and the time spent underwater by each of the Service expedition members.

DEPTH NAME	20ft to 39ft	40ft to 59ft	60ft to 79ft	80ft to 99ft	100ft to 120ft	TOTAL NO OF DIVES	TOTAL TIME UNDERWATER
A.R.N. GRAY	6	1	3	2	6	18	15 hr 33 min
D.A.J. TAYLOR	5	1	5	2	4	17	14 hr 56 min
B. PINGREE	3	1	5	2	3	14	12 hr 50 min

2. Diving conditions were rather variable; the worst visibility encountered was approximately 15ft (Gan Club reef) and the best was approximately 200ft (outer reef by Hitadu caves).
3. Normal precautions were taken whilst diving and no diving accidents happened.
4. No problems were caused by any form of marine-life other than sea-urchins (Diadema) whose spines always seem to find their way into hands and toes. Sharks were seen on three occasions.

DIARY OF EVENTS

20 April 1974 - All members of the expedition arrived at RAF Brize Norton and handed in their heavy baggage.

21 April - At 0830 hours the expedition party departed RAF Brize Norton aboard VC 10 Flight No. 2271 for an uneventful flight to RAF Gan via RAF Akrotiri, Cyprus.

22 April - The party arrived at the Blue Lagoon Hotel RAF Gan at 0215 hours and was met by Flt.Lt. Goodchild and members of the RAF Gan Sub-Aqua Club. After introductions and refreshments the visitors were taken to their accommodation in the Hotel.

Next morning Cpl. Gray completed arrival documentation and at 1030 hours Flt.Lt. Goodchild accompanied the party on a visit to meet OC RAF Gan, where plans were outlined and various topics arising from them were discussed. A liaison visit was made to the Education Centre where a lecture room and a slide projector and screen were made available for the scientists' series of lectures. Arrangements were also made to advertise the lecture programme over the local radio station "Radio Gan". The party were then briefed on the local regulations concerning diving, the use of the Gan Sub-Aqua Clubroom, air-charging, drawing of keys, etc..

After lunch, all aqua-lungs were charged and the three divers of the party embarked on a familiarisation dive off the "Club Reef" whilst the two scientists snorkelled in the shallower areas. Both parties collected representative samples of corals and molluscs and these were catalogued and, where appropriate, preserved. Dinner was then taken in the Blue Lagoon Hotel.

During the evening, Sqn.Ldr. Taylor, Sqn.Ldr. Pingree and Cpl. Gray went to the outer reef armed with face masks, torches, coral hooks and shell collecting bags in an attempt to collect some of the very beautiful nocturnal molluscs for their own collections (an activity known locally as "oggin troggin"). Dr. Taylor and Dr. Rosen spent the evening completing the preparation for their lecture programme. At 2330 hours the three shellers returned with some very attractive shells, despite frequent confrontations with Lion Fish and large toothy Moray Eels.

23 April - After an early start the party loaded the boat and headed for a shallow shoal area in the middle of the lagoon known as Medagala. Here the divers worked under the direction of the two scientists who snorkelled, and whilst doing so, pointed out to the divers which samples were to be taken. This system worked very well but was, of course, limited to the depth to which the scientists could snorkel or see below. In addition to the profuse fish life of this area, a notable feature was the abundance of octopus. One was seen swimming free and another five were seen in their lairs, all within a small area. Each of the lairs was made rather obvious by the pile of mollusc shells around the entrance (particularly Turban shells, all of which had the lip neatly chewed off where the octopus had extracted the animal).

During the afternoon more samples were collected from an area of the island of Midu, where the party was joined by the Gan Sub-Aqua Club.

At 2000 hours Dr. Taylor and Dr. Rosen conducted their lectures in the education section and covered the origin of coral reefs and coral reef ecology which attracted a very good attendance. The lectures were concluded at 2245 hours and everyone retired except Sqn.Ldr. Taylor and Cpl. Gray who joined Cpl. Sills of the Gan Sub-Aqua Club for an "oggin troggin" session on the outer reef flats where more samples of very attractive shells were collected.

24 April - Breakfast was completed by 0700 hours when the party set out for the reef flats on the oceanic coast of Gan. An extremely low tide was due at 0822 enabling relatively easy collection of coral and molluscs which would normally be almost impossible because of the depth of water and the huge breakers which pound the outer reef flats. Even with the low tide and almost still air the ocean breakers at close range were quite impressive. The collection of molluscs usually involved the moving of coral rubble under which they lived: many unpleasant surprises were given by Moray Eels who also frequent such places. The whole morning was spent on this activity and it proved quite tiring, the reef flats provided no shelter from the heat of the sun and everyone had to wrap up well to avoid its potentially dangerous rays.

After lunch the party was joined by the Gan divers and headed for Beacon Shoal, another coral knoll situated in the North West of the lagoon. Here

four teams of divers assisted the scientists in completing habitat and depth zonation sampling. During the exercise a coral was collected which had never been previously recorded in Addu Atoll, and indeed, had only been first described some six months previously.

During the evening Dr. Taylor and Dr. Rosen gave the second of their lectures to the Gan inhabitants and later gave another talk to the members of the Gan Sub-Aqua Club where various projects were outlined that were within the capabilities of the Club members. Discussion in this vein continued into the late evening.

25 April - Another early start was made to continue the sample collecting on the outer reef flats. The first exercise was to collect Mitra and Terebra from the sandy lagoon near the shore of Gan. This involved snorkelling in approximately 6 - 12 foot of water and following the trails of these molluscs on the sandy bottom. At the end of the trail one would find the creature buried an inch or so under the surface. An hour of this activity produced enough molluscs for the sample. The reason for collection was to enable Dr. Taylor to conduct a gut analysis on the creatures. Because it was important to halt the digestive process of the creatures it was necessary to crack open the shells to allow the preserving agent immediate access to the stomach to neutralise the acids therein. This practise rather upset the shell collecting fraternity who could not bear to see such beautiful shells being blatantly smashed. After the exercise was completed the party moved to the outer reef flats to be in time to catch, once again, the very low tide.

The local fishermen also took advantage of the low tide and a number were seen heaving around lumps of coral. Upon enquiry it was made clear that they were fishing for octopus by excavating the lair from around the animal, and quite a few were caught in this manner during the course of the morning. Nearer shore, in the shallow tracts where we had collected our molluscs for the gut analysis, fishermen were netting fish for eventual use as bait for tuna lines. They were obviously very successful for later in the day a group of them were seen transporting huge tuna towards the kitchens of Gan. It was obviously no coincidence that tuna appeared on the menu of the Blue Lagoon Hotel for the remainder of our stay.

During the afternoon another project involving the Gan divers was organised, the venue being Aruhal, another shoal area, situated in the middle of the lagoon. Here intensive sampling of Mollusca by habitat was carried out and a depth zonation sampling of coral was carried out down to a depth of 80 feet. Another project involving the measurement of light at 10 ft. intervals down to 120 ft. was also carried out.

During the evening Dr. Taylor and Dr. Rosen completed the classification and preservation of the day's samples and then went along to the Radio Gan studio where they recorded an hour-long interview for a programme which was to be broadcast at a later date at both RAF Gan and RAF Masirah.

26 April - After yet another early start the party ventured out on the reef flats off the southern end of Gan. Here Sqn.Ldr. Taylor and Cpl. Gray collected some fine shells for their personal collections including Cypraea tigris, caputserpentis, histrion, isabella, moneta, annulus and helvola and Conus hebreus, rattus, aulicus and litoglyphus. Moray Eels seemed even more plentiful in this area.

During the afternoon the party was joined once again by the Gan members for another period of sample collecting, this time from an area in the south of the lagoon known as Atlantic Shoal. Here the underwater visibility reached approximately 100 ft. and the fish-life was profuse with many species of Angel Fish, Damsels, Wrasse, etc. and oddities such as Unicorn Fish, Hump-Headed Wrasse and the beautiful Imperial Angel appearing during the course of a dive. A small Shark (White Tipped Reef Shark) was also seen during the afternoon.

Dinner was taken at 1930 hours and after completing the aqua-lung charging and classification and preservation of collected samples the party enjoyed an early night.

27 April - The morning was again taken up by the collection of samples from the reef flats of the southern end of Gan. In addition to the sampling of outer reef flat areas, clams were obtained by digging in the fine sand nearer the shore. Once more the abundance of Moray Eels kept everyone alert.

Diving was not possible during the afternoon as there was an air shortage

which necessitated conserving the remaining supply for the following day when a trip was to be organised to a venue outside the lagoon. All of the party snorkelled over the club reef, taking samples and photographing the coral formations.

28 April - As this was a Sunday the Gan Club were able to join us for the whole day. The first venue was to be the outer reef of Hitadu at a location known as Demon's Point. Again, all divers were involved in the collection of material for the two scientists. The reef here was vertical and continued straight down to a depth of a few thousand feet. It was a little disturbing at first snorkelling back to the boat over such a great depth particularly after a large Shark had been seen cruising around the area. Visibility was approximately 100ft. and the reef-life was prolific to say the least.

During the late morning the boat was moved round the reef to an area near the Hitadu caves. Here conditions were even better than those experienced during the morning. Underwater visibility was approximately 200 ft. From the surface one could see much further than divers 120 ft. below. The reef here was even steeper than the morning's location, indeed, the first 90 ft. of the reef beneath the boat was actually concave. At 120 ft. the coral was as plentiful as it was near the surface and from this depth one could see its continuance downwards to an estimated 250 ft. Marine life was again fantastic with large Groupers, Rays and a Shark appearing in addition to the more common but nonetheless beautiful reef fish.

On the way back to Gan the boat was joined by a school of dolphins and six people donned masks, snorkels and flippers and leapt into the water to join them. The dolphins were not too keen to stay around however and soon left the area, only to join the boat later in its journey when the exercise was repeated.

The evening was taken up by the sorting of samples collected during the day, charging aqua-lungs, washing down diving gear and cleaning out shells.

29 April - The scientists spent the morning completing their work on the samples collected during the previous day. The other three members of the expedition were joined by two members of the Gan Club and the boat was taken out towards Hitadu with the task of locating and buoying the wreck of the British Loyalty. This proved to be an easy task because despite the fact that the ship was sunk during the last war, there is still a continuous emission of oil from her holds which leaves a permanent oil slick over the site. Everyone completed a long deep dive on the wreck (110 ft. bottom) which is still in very good condition. Corals have established themselves on most parts of the wreck and the many nooks and crannies harbour all kinds of fish normally associated with a reef. It is possible to swim into the large holds and through the bridge. Every wreck has its monster and it is said that this one serves as the home for a Grouper of immense proportions but although we kept our eyes peeled it was nowhere to be seen. The wreck, however, is huge and we only managed to have a look over part of the upper decking and the stern, so we could well have missed him.

In the afternoon diving was carried out on the club reef, mainly for photographic purposes. The divers were careful to leave the water by 1600 hours as a night dive had been arranged for 2200 hours for a planned depth of 110 ft. and the elapse of 6 hours was necessary to eliminate the possibility of any decompression complexities arising.

At 2230 hours the divers entered the water. The purpose of the dive was to examine the deep sand for nocturnal molluscs and most of the dive was spent at depth where many varieties were collected (various olives, cones, augers and mitres). Whilst descending the reef to the sand a number of the beautiful but very toxic Lion Fish were observed. Puffer Fish were abundant too and on seeing these the divers could not resist giving them a gentle prod after which each fish suddenly ingested water until it resembled a prickly football, trebling its size. Lights were extinguished on the bottom to see the full effect of the phosphorescence which proved quite remarkable. After the elapse of a minute or so the eyes got accustomed to the dark and one could make out the other divers quite easily, especially when they exhaled and an explosion of phosphorescence burst from their exhaust valves and cascaded towards the surface. Even a slight movement of the hand produced a cloud of sparkling stars.

30 April - The morning was taken up by two dives under the "Wave Ruler", a RN supply vessel kept at permanent anchorage in the lagoon off Gan. The draught

of the ship was about 30 ft. and a dive under the heavily encrusted bottom proved quite spectacular. The first thing one noticed was the fact that this was a completely upside-down world and corals, sea fans and sponges grew towards the bottom of the sea, towards the light which was reflected by the sand on the bottom some 170 ft. below. The resident fish also swam around in an inverted attitude; one felt strangely out of place. The purpose of the dive was to collect Spiny Oysters (*Spondylus*) which were to be found in abundance amongst the beautiful pastel-shaded sponges and soft corals of the hull. Grey Snapper, various damsel fish and wrasse and a Lion Fish were seen as were hundreds of juvenile spiny lobsters hiding in the encrustations.

The island of Fedu was the venue for the afternoon's diving, for which the Gan Club joined the party and more sample collecting was carried out. An intensive sampling of Porites corals was carried out here as well as the usual zonation sampling.

1 May - All gear was loaded and the party accompanied by two members of the Gan Club headed for the island of Bushy, in the north of the atoll. The purpose of this visit was to enable the scientists to investigate strange growths on the coral around this island and to allow the expedition members to take underwater photographs at this venue where good visibility was predictable. The strange growth turned out to be a huge colony of a type of sea-anemone and the divers enjoyed visibility of approximately 90 to 100 ft. Although the coral scenery was not outstanding, a large Eagle Ray provided the photographers with an opportunity to obtain some unusual shots.

After lunch packing cases were obtained and specimens were packed. At 1700 hours (6 hours after leaving the water from the previous dive) the three expedition divers took to the water for a dive on the sunken LCGP located at 110 ft. off the Club Reef. The evening was taken up with the packing of diving gear and personal effects.

2 May - During the morning Cpl. Gray completed the clearance documentation for the party whilst Sqn.Ldr. Taylor bade farewell to the Station Commander. All the heavy baggage was transported to the Air Movements Squadron.

In the afternoon it was learned that there would be a 24 hour delay of our flight so everyone had a walk around the island. During the evening the party were treated to a guided tour of one of the 'night-spots' of Gan.

3 May - Mid morning it was confirmed that our aircraft would leave Gan at 2030 hours. The day was spent walking around the island, resting and looking for more shells in the shallows of the outer reef with the aid of hired masks, fins and snorkels. At 2030 hours the party departed RAF Gan.

4 May - The party arrived at RAF Brize Norton after a comfortable flight, cleared customs and immigration, and the expedition was disbanded at 0830 hours.

ANNOUNCEMENT

JOINT MEETING WITH THE MALACOLOGICAL SOCIETY OF LONDON AT CARDIFF,

Saturday 11 October 1975

A joint meeting will be held with the Malacological Society of London at the National Museum of Wales, Cathays Park, Cardiff, from 11 a.m. to 6 p.m. on Saturday 11 October 1975. This meeting is additional to the one listed on the programme card for October.

This will be an opportunity to view the new gallery of the Animal Kingdom and it is hoped to arrange a field visit in the afternoon to the nearby Glamorgan Canal nature reserve in Cardiff. 42 species have been recorded from the reserve, including the immigrant sinistral snail *Physa gyrina*. During the morning and at lunchtime interested visitors may have the opportunity to look over the well-known Melvill-Tomlin collection of Mollusca.

The museum is within walking distance of Cardiff General railway station and is situated in the civic centre not far from the castle. Members arriving by car may park in the museum car park immediately behind the building (access either from Museum Avenue or from Park Place).

The National Museum of Wales has kindly offered to provide hospitality of coffee, a buffet lunch and tea. To help the organisation would you please inform Dr. Chatfield, Zoology Department, National Museum of Wales, Cardiff, if you intend to come to the meeting as soon as possible and also indicate whether you have your own, or require, transport to the nature reserve.

Joint organisers: Dr. J. E. Chatfield and Dr. T. E. Thompson.

GENERAL NOTES

1976 CENTENARY EXHIBITION

It is hoped that, as part of the Centenary Celebrations next year, the Society will hold an exhibition open to the public. Present plans are that it will be a one-day show held in the Conversazione Room of the British Museum (Natural History). A series of tables round the room will carry exhibits showing something of the history of The Conchological Society, the marine census, the land and freshwater census, fossil molluscs, the more popular and interesting families of recent molluscs, etc., etc..

A member of the Society will sit behind each exhibit to answer questions and keep an eye on the exhibited items.

The tentative time for this exhibition is a Saturday in June.

To make the exhibition as comprehensive as possible a large number of members will be needed to look after the exhibits and act as reliefs. Would those people who are willing to help in this way, please advise Mrs. Celia Pain, who has kindly offered to co-ordinate.

THE JOURNAL OF CONCHOLOGY

It has been decided to have a line drawing of a shell on the cover of the Journal in future. We shall be very pleased to receive suggestions or suitable sketches of a shell which members would like to see on the front of their Journal. It is important to remember that it must be a line reproduction and not a photographic reproduction, because of the expense involved. Will you please send your ideas and wishes to the Editor of the Journal of Conchology, Dr. C. R. C. Paul, Dept. of Geology, The University, Liverpool, L69 3BX, as soon as possible.

THE SOCIETY'S PUBLICATIONS. Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19 (telephone: 01-771 9719) at 25p each, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, 30p to members and 50p to non-members, and can take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

SHELL COLLECTION. Mrs. B. J. Paton (who has been a Member of the Conchological Society since 1919) has presented a collection of fresh-water shells to the Alfred Jodrell Museum at Glandford, near Holt, Norfolk. The shells were collected at Horstead, near Norwich, in marshland near the River Bure.

WANTED. Land snails from Jordan, Syria, Lebanon, Iraq. Only with collecting sites and dates. Willing to buy or to exchange for Israeli land snails. Z.Bar, [REDACTED], Israel.

SHELLS ON STAMPS. Extend your interests to collecting shells on stamps. Details and selections on approval from: A. Gräinger, [REDACTED], Horsforth, Nr. Leeds.

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Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

SHELLS AS MUSICAL INSTRUMENTS

What Passion cannot MUSICK raise and quell!
When Jubal* struck the corded Shell,
His list'ning Brethren stood around
And wond'ring, on their Faces fell
To worship that Celestial Sound.

(*Genesis 4:21)

Dryden, "Song for St. Cecilia's Day, 1687."

"It is supposed that one of the most ancient musical instruments known, - the lyre, was first formed by strings being placed across the sea shell, as indicated by Dryden" (Cornelius, p.71).

"With respect to music, the particular object of our inquiries, it is the opinion of many of the ancient writers, that the first idea of a lyre was taken from the shell of a tortoise left on the banks of the Nile, with various other dead animals, after the river had retired from overflowing the country of Egypt. The flesh of the tortoise being dried and wasted within the shell, and the nerves and cartilages being firmly braced, were rendered sonorous. Mercury (=Hermes), it is said, walking on the banks of the Nile, struck his foot against the shell, which producing a sound, suggested to him the first idea of a lyre" (Eastcott, p.9).

The story of the birth of Hermes "is told in the Homeric Hymn to Hermes. Zeus used to visit the nymph Maia, the daughter of Atlas and Pleione, in a cave on Mount Cyllene, while Hera was asleep. She eventually bore his son, Hermes. The child was born at dawn, but was highly precocious, for by noon he was big enough to walk out of the cave. On doing so, he found a tortoise, which he killed and turned into the first lyre ever made" (Grant & Hazel, p.230).

Take your choice, but however invented, the carapace of a tortoise is a much more probable progenitor of stringed instruments than a mollusc shell. A Greek name for the lyre was chelys (=tortoise), and according to the legend of Orpheus, his instrument (a lute on the authority of Shakespeare) was made of tortoiseshell (Grove, 5:455).

A gastropod shell, however, such as Charonia, Turbinella or Strombus, is a likely forerunner of the trumpet (Sachs, pp.48-50, 152, 156, 157, 194, 201, 235; Saul, pp.19, 89):

Her heards be thousand fishes with their frie,
Which in the bosome of the billows breed.
Of them the shepheard which hath charge in chief,
Is Triton blowing loud his wreathed horne.
Spenser, "Colin Clovts come home again."

Already Triton, at his call appears,
Above the Waves; a Tyrian* Robe he wears;
And in his hand a crooked Trumpet bears.
The Sovereign bids him peaceful sounds inspire;
And give the Waves the signal to retire.
His writhen Shell he takes; whose narrow vent
Grows by degrees into a large extent.

Dryden, "Poems from Examen Poeticum."

(*another molluscan allusion: Murex blandarius).

So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sight of Proteus rising from the sea,
Or hear old Triton blow his wreathed horn.

Wordsworth, "The world is too much with us."

Wordsworth had a fancy for the shell-trumpet: it crops up in "The Excursion," Book Seventh; "On the Power of Sound;" "The White Doe of Rylstone;" and "On seeing a needlecase in the form of a harp." This wind instrument has inspired other bards:

The soul of music slumbers in the shell,
Till wak'd and kindled by the master's spell.
Samuel Rogers, "Human Life."

The following four (not consecutive) couplets are from "The Botanic Garden. Part 2. The Loves of the Plants. A Poem," by Erasmus Darwin:

Pleased trains of Mermaids rise from coral cells;
Admiring Tritons sound their twisted shells.

And now the Goddess sounds her silver shell,
And shakes with deeper tones the enchanted dell.

Here ceased the MUSE, and dropp'd her tuneful shell,
Tumultuous woes her panting bosom swell.

Sweet ECHO! sleeps thy vocal shell,
Where this high arch o'erhangs the dell.

Coming to modern times:

He blows on his shell low plaintive notes.
Walter de la Mare, "The Isle of Lone."

Oscar Wilde echoes Spenser in "A House of Pomegranates": "And she sang a marvellous song. For she sang of the Sea-folk who drive their flocks from cave to cave, and carry the little calves on their shoulders; of the Tritons who have green beards, and hairy breasts, and blow through twisted conchs."

According to Curt Sachs (pp.62, 63), shell-trumpets date back to the Neolithic period. Grove (8:564) maintains that "The primitive prototype of the trumpet is the plain gum-tree tube of the Australian aborigines....On a higher plane, and found over wide tracts of the primitive world, is the wood or bamboo tube provided with a bell of gourd or horn." The trumpet is evidently polyphyletic in origin, shells not being the only ancestors.

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A. E. Ellis

THE DISTRIBUTION OF THE INTRODUCED GASTROPODS UROSALPINX CINEREA
AND CREPIDULA FORNICATA IN ENGLAND AND WALES

The American tingle Urosalpinx cinerea and slipper-limpet Crepidula fornicata were introduced accidentally into England with consignments of oysters from the United States of America at about the turn of the century, and have since become serious oyster pests. Urosalpinx destroys enormous numbers of oysters every year on many grounds in Kent and Essex, and Crepidula, often present in densities of many tons to the acre, seriously interferes with efficient oyster cultivation on many east and south-coast beds.

Attempts have been made since 1966 to limit the spread of these and other pests by legislation prohibiting the relaying of molluscs from infected to non-infected areas. The 1974 Molluscan Shellfish (Control of Deposit) Order now requires that a licence be obtained from the Ministry of Agriculture, Fisheries and Food before certain deposits of molluscan shellfish can be made into the coastal waters of England and Wales. Similar legislation is being considered for Scotland which, like Ireland, is relatively pest-free. The Ministry's fishery scientists have, therefore, a keen interest in recording changes in the distribution of molluscan pests such as Urosalpinx and Crepidula which could be transported with consignments of commercially relaid shellfish. Periodic checks are made to try to ensure that colonisation of new areas is quickly discovered and the licensing arrangements altered accordingly.

Urosalpinx cinerea

Spread has been slow since the initial introduction, due to the lack of a free-swimming larval stage in the organism's life history. Although transport with oysters has led to some extension in the range, the American tingle is still confined to Kent and Essex. Checks on the presence/absence of the drill are made by the use of traps which consist of covered roofing tiles placed convex side uppermost in a row parallel to the shore near low water spring tide level. These provide ideal spawning sites for Urosalpinx, and are examined periodically during the summer months for the presence of spawn capsules, which are of characteristic shape and easily distinguishable from those of the native drills, Nucella and Ocenebra. Results over the last three years indicate that some extension has occurred in the distribution of the tingle since it was last recorded in the late 1950s, but no new discrete areas have been colonised. Urosalpinx is now thought to be present from the Herne Bay region to Minster (Isle of Sheppey) in Kent and from Great Wakering to Frinton in Essex.

Abundance estimates have also been made at one site in the River Roach in Essex, which was previously studied in the mid 1950s. The total number of spawn capsules caught in the two summers between May 1972 and October 1973 was just over 260 per individual tile-trap; in a comparable period in 1955 and 1956, the total was approximately 290 per tile. It would seem therefore that Urosalpinx numbers have remained fairly constant in the last 20 years, at least at the selected site, after the initial build-up following introduction.

Crepidula fornicata

Like the tingle, the spread of Crepidula has been encouraged by its transfer with relaid oysters but, in addition, it has probably been transported to other sites on the hulls of ships, especially those held at anchor for long periods before being broken up. Because of its pelagic larval phase, the natural spread has been more rapid than that of Urosalpinx and most of the south coast of England is now infested to varying degrees. Surveys of coastal areas in the last few years have provided few new records, but specimens have recently been found in Swansea Bay, and it is likely that slipper-limpets occur in other areas to the south and east of Milford Haven, the only area in Wales previously known to be infected. For the purpose of implementing the Control of Deposit Order, slipper-limpets are now regarded as being present in all coastal waters of southern Britain from New Quay in mid-Wales to Yarmouth in Norfolk, with additional local infestations in the Blyth and Cleethorpes areas on the east coast.

We should like to emphasise again the importance of keeping the distribution records of both Urosalpinx and Crepidula up-to-date and we would be very grate-

ful if Society members would keep a special watch for these gastropods in their areas. A "find" in a new area is of obvious significance, but records from within the known distribution limits are also very valuable and ALL information will be very gratefully received.

Andrew Franklin, Graham Pickett
MAFF Fisheries Laboratory, Burnham-on-Crouch, Essex, CMO 8HA

RECORDS FROM JORDAN AND ARABIA

Dr. Martin Williams handed over to me a small collection from Jordan for examination, which had been collected in the Wadi Rum, $29^{\circ} 30' \text{ N.}, 35^{\circ} 25' \text{ E.}$, at an elevation of 700 m. Most of the shells were those of Sphincterochila fimbriata (Bgt.) but there was also a specimen of Buliminus (Buliminus) sinaiensis Heller described as recently as 1970, the type locality being Har 'Arif in the Israelic Negev at $30^{\circ} 25' \text{ N.}, 34^{\circ} 43' \text{ E.}$, not so far from the Wadi Rum locality. I am very grateful to Dr. L. Forcart for naming the Enid and for suggesting to me that my original determination of the helicoid shells as S. candidissima (Drap.) was undoubtedly wrong.

The material from Arabia was given to me by Mr. Martin Brunt who, unfortunately, is not entirely certain of quite where in the Yemen it was obtained since the material had been mislaid. He is fairly certain it was collected in the FAO Tree Nursery near Ibb in July 1973. Two shells of Eobania vermiculata (Mull.) are apparently the first record of this common species from Arabia, undoubtedly introduced accidentally. According to Dr. Forcart this species is not recorded from Palestine in any publication but has recently been found in gardens in Jerusalem. Also present was a single specimen, unfortunately damaged, of Zonites (?) sabaeus (von Martens) originally described as Trochomorpha sabaea. Connolly records this species from between Ibb and Yarim in his paper on South Arabian Non-Marine Mollusca (Brit. Mus. Exped. to South-West Arabia, 1937-8, 1(4) : 19 (1941). Dr. Forcart points out that the species belongs to neither genus but an anatomical examination is necessary to determine its correct affinities. A single specimen of Phenacolimax (Arabivitrina) arabica (Thiele) was also found. In my paper on a previous collection from Mr. Brunt (Journ. de Conchyl. 111 : 3-8 (1974)) I referred to a number of specimens as Vitrina cf. arabica Thiele and gave the radula formula as $32/2.18/3.1/3.18/3.32/2 \times 99$; these specimens are undoubtedly conspecific with the single shell in the latest collection. Dr. Forcart reports that this corresponds well with the description of the type specimens in the Berlin Museum by Hesse (Arch.Moll. 55 (4) : 136-138 (1923)) and the formula given by him for the radula is $Y/2 + X/3 + 1/3 + X/3 + Y/2 \times 105$ ($X + Y = 56$) which corresponds with my result and confirms the identification.

Finally two small Helicoids are probably what Connolly wrongly reported as Helicella derbentina (Andrz.). Forcart points out that this belongs to Xeropicta and its distribution is from Iran to Turkey; he suggests the Yemen shells may belong to a new species of Trochoidea (Xerocrassa).

All the material has been placed in the Natural History Museum at Basel.

B. Verdcourt

PINNIDAE - 17 LIVING SPECIES

Indo-pacific Mollusca.

"The Pinnidae have considerable economic importance in many parts of the world. They produce pearls of moderate value. In the Mediterranean area, material made from the holdfast or byssus of Pinna nobilis Linne has been utilized in the manufacture of clothing for many centuries: gloves, shawls, stockings and cloaks. Apparel made from this material has an attractive golden hue and these items were greatly valued by the ancients."

"The byssus of the Noble Pen was used by the ancients and by Sicilians as late as the nineteenth century in the manufacture of speciality clothing items, such as gloves, stockings, caps, and collars. The threads, spun by the foot of the Pinna, are fine, strong and of a deep, bronze colour. Fishermen gathered the pen shells by using long-handled tongs, sometimes twenty foot in length. The byssal tufts were washed in soap and water, dried in the shade, combed and finally carded. A pound of byssus would produce only three ounces of high-grade threads. In 1754, a pair of sea-silk stockings was presented to Pope Benedict XV. Queen Victoria is said to have worn a pair made in Taranto, Italy. Some historians have suggested that the Golden Fleece, sought by the legendary Greek, Jason, was a piece of cloth made from Pinna silk. Its elusive qualities may stem from the fact that the material is readily destroyed by clothes moths. Early illuminated manuscripts of the fourteenth and fifteenth centuries show kings wearing collars of Golden Fleece resembling Pinna silk.

Today, the manufacture of this silk cloth has evidently disappeared. etc." (although small souvenir items are still made in Minorca)

IS this the origin of "cloth-of-gold". Compare the weight of a piece of cloth made of gold thread with a piece of the same size made from Pinna silk.

The 'Field of cloth of gold' in 1520, the meeting of Henry VIII and Francis I of France, when both monarchs did their best to out-do the other in splendour and magnificence, may have been so called from the product of the humble Pinna!

If the Golden Fleece was made from Pinna-silk, then it is interesting to consider that one of the greatest orders of chivalry is 'The Order of the Golden Fleece' instituted by Philip the Good, Duke of Burgundy at Bruges in 1430. The grandmastership of this order passed to the Hapsburgs and became the highest order of the Austro-Hungarian Empire - equivalent to 'The Garter' in England. It was also bestowed by the Spanish Hapsburg dynasty and subsequently by the Spanish Bourbons. The only non-Catholic ever to receive the order was George IV - by special dispensation of the Pope.

Peter Oliver

THE SNAIL IN NINETEENTH-CENTURY VERSE

"The snail has been but rarely the subject of poetical treatment. Minor poets would be afraid of touching it; and even in the hands of those great masters to whom it has been given to interpret the deeper harmonies of the universe, it is only upon rare occasions that this little animal could fittingly present itself as a link in the chain of their conceptions.... Indeed there appears no great congeniality between the tribes of the 'Helicidae' and the atmosphere which has been deemed suitable for epic or for serious poetry; they do not readily live and flourish on Parnassus." J. G. Jeffreys, British Conchology, vol.1 (1862).

Jeffreys quotes "The Snail" by William Cowper, a rendering of Ad Limacem from Vincent Bourne's Poemata, Latine partim reddita, partim scripta (1734; 2nd edition, 1743), which, although written in the eighteenth century (Cowper died in 1800), was first published in William Hayley's Life and Letters of William Cowper (1803). Cowper had been a pupil of Bourne's at Westminster School:

To grass, or leaf, or fruit, or wall,
The Snail sticks close, nor fears to fall,
As if he grew there, house and all
Together.

"The House-keeper" (Album Verses, 1830) by Charles Lamb is also a verse translation of Bourne:

The frugal snail, with fore-cast of repose,
Carries his house with him, where'er he goes;
Peeps out--and if there comes a shower of rain,
Retreats to his small domicile amain.

Poems on Conchology and Botany by Sarah Hoare (1831) contains two stanzas on Helix, which were quoted in The Conchologists' Newsletter, No. 23, p.24 (Dec. 1967). The remaining occurrences of Helix aspersa in nineteenth-century verse (excluding casual or incidental references) which I have been able to discover are in rhymes written for children.

The snail was amongst the guests invited to "The Butterfly's Ball, and the Grasshopper's Feast," which was first published in The Gentleman's Magazine and Historical Chronicle for November, 1806, "Said to have been Written by WILLIAM ROSCOE, Esq. M.P. for Liverpool, for the Use of his Children; and set to Music by order of their MAJESTIES, for the Princess MARY."

And the Snail, with her horns peeping out of her shell,
Came, fatigu'd with the distance, the length of an ell.

With steps most majestic the Snail did advance,
And he promis'd the gazers a minuet to dance;
But they all laugh'd so loud that he drew in his head,
And went in his own little chamber to bed.

The snail has undergone a change of sex in the course of the narrative!

Next follows a trifle by M. L. Elliott, which is headed by a deplorable drawing by Ernest Griset, in "National Nursery Rhymes and Nursery Songs set to original music" by J. W. Elliott (Novello & Co., 1870):

Six little Snails
Liv'd in a tree,
Johnny threw a big stone,
Down came three.

One of her charming sketches (though the snails are microscopic) heads the following sextain by Kate Greenaway in "Under the Window: Pictures and Rhymes for Children" (Routledge, 1878):

Little Miss Patty and Master Paul
Have found two snails on the garden wall.
"These snails," said Paul, "how slow they walk!--
A great deal slower than we can talk.
Make haste, Mr. Snail, travel quicker I pray;
In a race with our tongues you'd be beaten to-day."

The snail was not overlooked by that celebrated Devon 'squarson' the Revd. Sabine Baring-Gould, who like Cowper was a hymn writer, now best remembered, abetted by Sir Arthur Sullivan, for "Onward Christian soldiers," though his most monumental work is The Lives of the Saints in sixteen volumes. Amongst the many publications (which occupy over six pages in the British Museum Catalogue) of this 'writer of simply dizzying prolificity' is A Book of Nursery Songs and Rhymes (Methuen, 1895), one of which is "The Snail":

The snail crawls out with his house on his back,
You may know whence he comes by his slimy track.
Creep, creep, how slowly he goes,
And you'd do the same if you carried your house.

The snail crawls out with his house on his back,
But a blackbird is watching him on his track.
Tack, tack! on the roof of his house,
He gobbles him up as a cat does a mouse.

This theme of carrying its house on its back runs through so many of the snail verses that it grows tedious. Surely every author cannot have imagined that he was the originator of this whimsicality! The Fool tells King Lear, "I can tell why a Snaile has a house." Writes John Donne (1633):

And seeing the snaile, which every where doth rome,
Carrying his owne house still, still is at home.

Wordsworth (Liberty) in one of his less inspired moments perpetrated:

The beetle loves his unpretending track,
The snail the house he carries on his back;
The far-fetched worm with pleasure would disown
The bed we give him, though of softest down;
A noble instinct.

So many minor versifiers have followed these masters that one longs for a penal injunction against it. This recurrent drollery goes back over 2700 years to Hesiod, who in "Works and Days" nicknamed the snail 'house-carrier' (phereoikos):

The House-bearer, from his winter quarters
Roused by Pleione's gentle daughters,
Ascends the plants. These vernal days
Indolent hinds must mend their ways;
The grape-vines should have all been hoed;
Sharpen your sickles, take the road.

A. E. Ellis

PUBLICATIONS RECEIVED

"Discovering Garden Insects and other Invertebrates" by Anthony Woolton, 79pp. and 58 black and white plates. Shire Publications Ltd. (No. 190), 1975, 45p.

The average garden is fairly rich (so to speak) in invertebrates and when one considers that, as this useful little book makes clear, what you identify as an earwig may be one of seven species, and that your garden may contain up to 54 kinds of lacewing fly, 160 species of thrips, 5200 of diptera (flies) and 6200 different bees and wasps, then it is not to be expected that the Mollusca could receive very full treatment. A bitter gardening mind however, might claim that their influence is quite out of proportion to the number of species involved.

Mr. Woolton deals in a very clear and direct fashion with the classification of the invertebrates, and the information provided is quite adequate for the non-specialist who wants to find his way about the kingdom of small creatures. You are then taken round the garden and those common species are discussed which are normally to be found in each type of cultivated ground, as well as the parts you never got round to cultivating. The habits, many of them undesirable, of the invertebrates so met with, are detailed. For instance, should you examine a zebra spider for any length of time, it will raise itself up and stare back at you with an air of reproof. It is noteworthy that woodlice are the only terrestrial crustaceans and many of them still make do with gills, which confines them entirely to damp places. They are not accused of being harmful to plants.

The short treatment of the Mollusca serves as a useful bird's eye view of the group, adequate for the gardener. The theory is offered that the homing capabilities of the Helicidae are effected by their retracing their own slime trails but this does not explain the fact that they will still come home even when thrown as far as possible into neighbouring gardens.

Of the good little illustrations, three show examples of the Mollusca, one of which is an interesting live sinistral Cepea nemoralis. Like most of the series, this book is equipped with a glossary, a bibliography (this quotes the 1926 edition of Ellis's 'British Snails' which is unlikely to be available) - and a list of Societies that one may join. The Conchological Society is included but unfortunately all the data given about it are quite out of date.

Although this book costs more than others in the series it is also longer, and remains very good value indeed. It may unreservedly be recommended to conchologists on the principle that anyone studying a given subject should have a good general knowledge of the subjects fringing it.

T.E.C.

'How to Find, Clean and Collect Shells' by Bob Tutelman, 1975. Published by R. A. Tutelman, [REDACTED], Sun City, Arizona 85351, U.S.A. \$1.75 plus 0.25 p. and p.

This paperback aims to compress a large subject within its 43 illustrated pages, but by sticking very closely to essentials the ground is pretty effectively covered, and although most of the information has been previously written up, it exists in magazine articles by various people scattered over the years, so that it is certainly useful to have it all together in book form.

The author starts by assuming that the shells to be found are tropical marines, and advises that the only reasonable way to find them these days is by skindiving, dead shells being almost invariably unacceptable under modern standards of competitive collecting in the U.S.A. Useful hints are provided about the spotting of camouflaged molluscs and the diverse habits of most of the popular shell families; patterns left in the sand can be characteristic and it is useful to know which molluscs are active at night. The hazards of collecting in the tropics, which may be considerable, are given a chapter of their own, and one is justly warned against the greatest of them, which is that the practice is extremely habit-forming.

Every shell collector owes it to his hobby to do his best to conserve the environment, and the author advocates the increased use of photography as well as providing the obligatory instruction to 'turn that stone back', and to avoid taking large quantities of anything.

The cleaning of shells is thoroughly dealt with, most of the known methods being reviewed, even the 'bug-box', with their relative merits described from a position of obvious experience. The author accomplishes a considerable feat in writing the chapter on Identification without mentioning a single scientific name; in fact, he steers clear of technicalities throughout, considering as he says, that common names are 'more fun' and that the binomials should be kept in reserve to impress raw novices and visiting professors. There may be something in this; however, the average American collector has certainly become well accustomed to the Linnean system in recent years.

Mr. Tutelman is less successful in his glossary, which commences 'AUGERS: a family of long skinny shells. CERITHS: another family of long skinny shells. The mouth is slightly different in shape from the augers.' and a new aspect on an old misconception is revealed by his 'MALACOLOGIST: a scientist who studies molluscs. If he specialises in gastropods he can also be called a CONCHOLOGIST.'

Should this book fall into the sandy hands of any novice who has just admiringly picked up his first beautiful shell on a tropical beach, it would almost certainly convert him into an enthusiastic collector.

T.E.C.

OSTREA EDULIS L.

During a dive in the Mixon hole, Selsey recently, a question was posed:- Is Ostrea edulis returning to the area? The dive which lasted 25 minutes was for archaeological purposes, but during the dive I was struck by the number of Edible oysters lying on the bottom. I collected eight, seven live and one dead. The measurement of the live specimens ranged from eight to thirteen cms., the dead specimen measuring an outsize 15 cms. All oysters were later consumed by Major Hume-Wallace, leader of the dive, and myself (one only as I do not profess to be much of a gourmet) and pronounced to be excellent.

In days gone by Selsey had quite a thriving oyster industry. Edward Heron-Allen's book "Selsey Bill, Historic and Prehistoric" talks of oyster shells found in the Mound at Church Norton near Selsey. Also he says that it is not improbable that some of the earliest oysters imported into Rome from Britain came from our shores here at Selsey. He gives the weight of oysters landed by local fishermen during 1908 as 82,000 cwt. Dredging for deep sea oysters in the Looe stream took place between August and May. In recent years the industry has died out altogether due mainly to overfishing and pollution.

The question I ask is - and I would be glad to hear from anyone with knowledge on the subject - Is this just a small isolated area where conditions suit or could there be a return to the commercial days of oyster fishing?

Ted Clamp

PROJECT COUNTDOWN

Thirty clubs from the British Sub-Aqua Club, the Scottish Sub-Aqua Club and the Welsh Sub-Aqua Club combined forces last year to go seaweed collecting. Eight hundred divers, snorkellers, wives and children all helped to make Project Countdown a great success. Charles Sheppard and David Bellamy of Durham University plan to compare the depths at which the Kelp Laminaria hyperborea was found growing, with the animals found living in their holdfasts, and with the concentrations of heavy metals in their tissues. The aim is to produce a map of Britain's polluted waters in 1974.

Without resorting to a microscopic examination, 237 species of animal were found in the holdfast habitat. This included little fish, crabs, barnacles, sea anemonies and worms. Information on the 72 species of molluscs, recorded from 27 locations has been sent to Shelagh Smith as a contribution to the British Marine Mollusc Census.

If you ever need help with an aquatic project, why not contact your local Sub-Aqua Club? Divers are becoming more and more aware of the Natural History of the sea, rivers and lakes. Many members would really appreciate guidance in their studies, while you may actively discover the excitement of our sub-aqua sport.

N. J. A. Phillips

OXYSTYLA ZEBRA (MULLER). A WEST INDIAN SPECIES FOUND IN BANANAS

On Christmas Day 1963, Mr. Harry Taylor was in his greengrocer's shop in Westgate, Southwell. He had carried three boxes of bananas inside which had been outside over three days, and for three consecutive nights there had been severe frosts. When my daughter and I were going by the shop, Mr. Taylor opened the door, and said he had something which might be of interest to me. He gave me a toffee bag in which was an almost mature snail, I recognised to be a specimen of Oxystyla zebra (Müller). On close examination at home I found thin brown fluid oozing from a small hole in the epiphragm, usually such fluid gives off a nauseating stench, denoting the snail is dead. However this fluid did not give off any stench, so I carefully removed the epiphragm, and placed the shell, aperture uppermost in a saucer of luke-warm water, and with the aid of a watchmaker's lens I was able to see a faint movement of the foot, so then I knew the snail was still alive. The snail was put into a glass 2lb jar, in which a mixture of leafmould and lightsoil had first been placed about 2 inches deep, a few twigs and a piece of clean white blotting paper, my usual standby until I find what other food a snail will eat to survive. It was a time for patience, the snail laid where it was placed until 6 January 1964. When during the evening the snail emerged from its shell, and after the lid of the jar was removed, crawled round the rim for about half an hour, it then moved on to the blotting paper and started to feed, and did so each evening until 18 January when the snail made a new epiphragm, and went into a state of aestivation until the 7 May, when during the evening it emerged from its shell and started to feed on the blotting paper. Lettuce placed in the jar was refused. On the 8 May it was feeding on the discarded epiphragm. On the 11 May I noticed some new growth of shell, which when measured was just over 4mm. On 12 May it was feeding on raw potato placed in the jar on the previous day but a piece of apple was refused. The genus Oxystyla being arboreal it was logical to think the food of these snails to be cryptogamic. On 16 May a piece of algae-covered ash bark was placed in the jar and in two days the bark was cleaned of the algae. A piece of apple bark covered with a pale green algae was refused, as was a slice of cucumber, so on 23 May a piece of ash bark covered with a bluish grey lichen was placed in the jar, and was readily eaten. This formed the

snail's diet, along with blotting paper, until it died on 29 July 1965. The animal was beautiful to see, it was bulky, oblong in shape, bluntly rounded in front, and attenuated to a point behind. The upper surface was of a sulphur yellow colour, shading to a bluish grey, to turquoise towards the foot margin. The upper tentacles, bluish grey, were long and slender, with distinct bulbous extremities. The lower tentacles much shorter, the colour sulphur yellow like the upper part of the animal. The jar in which the snail was placed, was put in a warm spot by the fireside kerb, a few holes were pierced in the metal lid on the jar to allow for condensation within the jar. It was necessary to sprinkle a few drops of water into the jar from time to time to give the required humidity. As previously stated, when the lid was removed the snail would crawl round the jar rim for about half an hour. When my wife came home from shopping one day, the lid was on the floor and the snail was resting on the underside of a shelf by the fish tank. Needless to say it was speedily put back into the jar and the lid firmly clipped on. Sometimes I would put an aspidistra plant by the fish tank and the snail seemed quite happy to crawl among the leaves. In summer I sometimes took the snail into the garden and put it on the Indian Shot plants Canna indica. It would glide over the leaves rather rapidly, leaving a colourless slime trail behind, and I have two colour photographs taken on 4 September 1964 in which the slime trail is very clearly visible.

C. R. C. Paul, 1963, listed a number of West African and West Indian species in his note, Snails Introduced with Bananas, read before the Society at the meeting of 20 April 1963. He mentions that most of the specimens were found alive and were kept for some time in vivaria at Cambridge, and that all died fairly soon after collection.

Paul, C.R.C., 1963. Snails Introduced with Bananas. Journal of Conchology, Vol. 25, No. 5, p.200.

G. W. Pitchford

GENERAL NOTES

"Pestalozzian Conchology". Genera or species cited under English names in the final paragraph of this article (Newsletter No. 54, p.450).

Savage Claw (misprinted 'Clam'), Lambis chiragra; Thorny Woodcock, Murex tribulus; Hoof-shell, Nerita; Bleeding Tooth, Nerita peleronta; Crosier Nautilus, Spirula; Paper Sailor, Argonauta; Simpleton's Kneading-trough, Mactra stultorum; Cat's Paw, Spondylus plicatula (?Geukensia demissa); Bear's Paw Clam, Hippopus; Antique Lamp, Anomia and *Terebratula; White Stone Piercer, Barnea candida; Wood Dipper, Scaphander lignarius; Stream Dipper, Physa fontinalis; Weaver's Shuttle, Volva volva; Spotted Tun, Tonna dolium; Triangular Helmet, Cassis flammea; Staircase Shell, Architectonica perspectiva; Tiger Spire, Terebra subulata; Zebra Shell, Trochus dolabratus (?Bankivia fasciata).

*a brachiopod

!!

In a recent B.B.C. 'Brain of Britain' quiz broadcast, there was a question on the meaning of the word 'malacology'; in case you did not hear the programme, the answers were:-

Competitor No. 1	- 'don't know'
" No. 2	- 'a dirty book'
" No. 3	- 'apples'
" No. 4	- 'malachite'

(from Wilfrid M. Appleby)

Who is Little Willie?

Gems, the British Lapidary Magazine, vol. 4, No. 2, contains an article on "Freshwater Pearls" by Tom Clogger (page 10), which is followed by an article on "Scotland's Finest Pearls" by Trixie Thomson in No. 3, p. 4 (1972). "Little Willie" is the largest freshwater pearl known. It was found in August 1967 by Bill Abernethy of Coupar Angus in the river Tay at Stanley, and is now in the

possession of James and Alistair Cairncross, 18 St. John Street, Perth, specialists in freshwater pearl jewelry. This peerless pearl is half an inch in diameter, weighs $44\frac{1}{2}$ metric carats, and is of perfect shape, Orient tinting to lilac. Its nominal value is £10,000, but it is priceless and not for sale. Fifty five years ago pearls to the value of two thousand pounds were taken from the river Don in one season. It is not stated how many Margaritifera were destroyed.

A. E. Ellis

Collecting Records

Mr. D. R. B. Harrison of Birkenhead has kindly submitted a long list of marine molluscs collected at Southport, Lancashire, by 2 members on 18th. January and 3 members and a visitor on 22nd. February last. The great majority of specimens were 'shell only', but 3 were 'live collected'. The original list is available to anyone interested - S.A.E. please, to the Newsletter Editor.

The Society's Publications

Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19 (telephone 01 771 9719) at 25p each, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, 30p to members and 50p to non-members, and can take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

Information Wanted

BARNEA CANDIDA (L.) I would be most grateful for any reliable information on the depth of water, average length, and approximate location of any living Barnea candida populations or populations known to have been alive during this century. P. Lingwood, Dept. of Geology, University of Liverpool, P.O. Box 147, Liverpool, L69 3BX.

Shells for Sale

A fine selection of shells for the collector is available at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (tel. 01-437 9391).

Exchange Wanted

Mr. J. Hermans, [REDACTED], B9110 St. Amandsberg, Belgium, is particularly interested in the Patellidae, Acmaeidae, Calyptraeidae, Fissurellidae, Naticidae, Syphonaciidae and Japanese land and freshwater molluscs, and other molluscs generally. He can offer 350 shells from Europe, West Africa and the Arctic. Also land and freshwater shells from Belgium and Japan. More than 2,000 other species from all over the world. Anyone interested in exchanges, please write.

A Current Exhibition in Paris. COQUILLAGES DU MONDE. Shells of the World.

This large exhibition covers the form of shells, their colours, the life of molluscs, molluscs in modern scientific research, shells from different regions of the world and the uses made of shells by man. It is now open in the Natural History Museum in Paris but it is expected to close after Easter 1976. The exhibition was prepared under the direction of Dr. J. M. Gaillard, Laboratoire de Malacologie, Museum National d'Histoire Naturelle, Paris, France. The museum has prepared a large well-illustrated catalogue of this exhibition.

Dear Readers,

For many years now the Society has been able to publish regular issues of this Newsletter and I believe that many of you have found something of interest, useful information and, perhaps, a little entertainment in most issues. Certainly I have tried, in the last $11\frac{1}{2}$ years as Editor, to achieve variety, both of subject and treatment, in order to cater for beginners and amateurs as well as experienced collectors and professionals. Naturally I am entirely dependent on the various contributors who send in long or short articles, field meeting

reports, news items, information notes, announcements and requests. It is inevitable that I have relied to a large extent on a nucleus of active and enthusiastic writers whose names will be familiar to you. I have on occasion been pleased to receive contributions on particular subjects from authors who have not been Members of this Society and some of these have subsequently joined the Society.

However, in the last 12 months, the volume of material submitted has dwindled and now I am faced with the sad prospect that I shall not be likely to prepare more than two issues of the N/L in 1976. This is most regrettable, especially in Centenary Year, since it reflects a general apathy and reluctance to take an active part in the subject of your choice. It is probably part of the very general belief that "they" will do what is necessary and produce the required results. I must point out that "they" is synonymous with "you", dear Readers. To put it bluntly, it is up to all of you to decide, in a proper democratic manner, if you want to continue and maintain a quarterly newsletter. This can only be achieved by a regular flow of material from as wide a range of readers as possible, of all ages and experience, and particularly the many Members who are interested in tropical marine shells.

Yours hopefully,

P. E. Negus,
Newsletter Editor

Dear Reader,

I would like to add my comments to those of your N/L Editor. I ENJOY the Newsletter and would be very sorry to see it decline in either quality or in number of issues. I feel sure that most of you enjoy it also and would feel sad if it ceased to exist. Don't let this happen. Every one of you is capable of writing about something of interest, whether you are a Junior Member, an old age pensioner, a complete beginner or a professional. Sit down and write something now, submit it to Mr. Negus and he will do the rest. Swamp him with articles and show him that you are not apathetic, show him that you want the Newsletter to continue, show him that you do, in fact, CARE.

Yours sincerely,

E. Beryl Rands,
Hon. Secretary

CHRISTMAS 1975

The Newsletter Editor sends the Season's Greetings and Good Wishes for the New Year to every reader.

IT IS PROPOSED TO HOLD a Field Meeting in Northern Ireland next year for the purpose of recording both Land and Freshwater and Marine Molluscs. This would be a 3-4 day meeting to be economically feasible. It will be possible for Sub-aqua facilities to be available. Suggested dates are Spring Bank Holiday weekend or 2-5th. July 1976. The meeting will be led by Elizabeth Platts, Bernie Picton and Helen Ross. Interested members should contact Helen Ross (Mrs.), Department of Botany and Zoology, Ulster Museum, Botanic Gardens, Belfast, BT9 5AB, stating which weekend would be most suitable.

also -

THE ULSTER MUSEUM is trying to build up a good reference collection of Exotic marine Mollusca and would welcome donations of identified specimens, if possible with locality data, from members with shells to spare. Postage costs would of course be refunded. Contact Mrs. H. Ross.

Produced by THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

1976

It is pleasant to remind readers that this year is the Centenary of the founding of this Society. It is hoped that as many members as possible will attend one or more of the various events arranged to celebrate this occasion.

COWRY SHELL STAMPS

Some time ago I was asked to write an article on shell stamps for the Newsletter but, because of the difficulty in producing suitable illustrations, I put off writing one until a way could be found to illustrate stamps. The problem with stamps is that many of them rely upon colour for their effect. As you can see herein a way has been found to illustrate them although the quality of reproduction is very variable depending on the artistic style of the stamps depicted. Those with a well-defined drawing obviously come out far better than those relying more on colour gradation. Even so, the illustrations should serve to identify the stamps depicted.

Shell stamps have been produced since 1859 when the Bahamas issued two stamps of Queen Victoria bearing small inset designs depicting, on the left a pineapple and on the right a conch. Since then about 2,000 (including listed varieties) stamps with molluscs represented somewhere in the design have been produced, with a bumper year in 1974 for both quality of design and for number of stamps issued. Just over a thousand shell stamps come from the Indian Feudatory States of Cochin, Travancore and Travancore-Cochin and were issued between 1888 and 1950. These all bear a highly stylised and simplified representation of a chank shell somewhere in the design.

Of this truly vast number of shell stamps it may come as a surprise that, to the best of my knowledge, only 37 have been produced using cowries somewhere in the design.

There are two contenders for the distinction of being the first cowry stamp. Both were issued in 1952 and both have cowries only incidentally in the design. The first is a stamp from the Maldives Islands illustrating native products including at least one, and maybe two, large cowries amongst the assembled items. The second is a stamp from Papua and New Guinea (fig. 14) showing a native tribesman wearing a necklace unmistakably made of small cowries. The question as to which was issued first cannot be answered as the exact date of issue is only known for the latter stamp (30th. October). It would seem likely, however, that the Maldives Islands stamp was issued first in view of the fact that the Papua and New Guinea stamp was issued late in the year.

As may be expected there are very few stamps depicting the animal and not just the shell. The most noteworthy are four stamps produced recently by the Gilbert and Ellice Islands (see fig. 10) which not only show both dorsal and ventral views of fresh clean shells but also the living animal. The detail and accuracy of these stamps is really superb and one hopes that other stamp designers will take note. The remaining stamp showing the animal comes from Umm al Qiwain (fig. 19) and is, unfortunately, in quite a different category. Firstly, it is not recognised as a valid postal issue by our premier stamp dealers, Stanley Gibbons, owing to this country's habit of producing a great

many stamps primarily for philately and not making them readily available for postal use. The postmark on the stamp illustrated here does not prove it has been used on a letter but was put there, again, solely for philatelists. The animal is only identified by an ambiguous English name, "little warty cowry", and is strictly indeterminate.

Four New Caledonian stamps (see figs. 12 & 13) deserve special mention for the excellence of their artwork. The drawings are very finely executed and are accurate representations of the species named. This country has also produced four stamps of Murex, Strombus, Lambis and Conus, all in the same style.

Both the Cook Islands (see fig. 3) and Aitutaki (part of the Cook Islands but with a separate postal service!) (see fig. 4) have produced superb sets of 19 and 14 shell stamps respectively, two in each case showing cowries.

The Antiguan stamp (fig. 1) is one of a set of four shell stamps of special interest as the shells depicted on them are now housed in the Leeds City Museum.

Several stamps showing named cowries unfortunately represent misdetermined shells or are so poorly illustrated as to make the shells strictly indeterminate. The Cuban stamp (fig. 7) of "Cypraea zebra L." is obviously incorrect and represents a shell more like C. cervus. The C. mauritiana on the Kenyan stamp (fig. 6) could just as easily be a caputserpentis; the C. tigris on the Wallis and Futuna Islands stamp (fig. 20) is certainly not a tigris but is too badly drawn for any determination and the C. stercoraria on the Togo postage due stamp (fig. 16) is rather ambiguous and could be one of several species.

The Fiji stamp showing a Golden Cowrie (fig. 5) is one of a set of 17 natural history stamps. It was first issued on 15th. July 1968 with the value "3/-". The set was soon re-issued on 13th. January 1969 with decimal currency (30c) and it was one of two stamps of the set re-issued a second time on 4th. December 1972 with the overprint "HURRICANE RELIEF +10c".

A catalogue of the 37 cowry stamps is presented below. The numbers given are those presented in Stanley Gibbons' 1976 catalogues and the prices are of mint stamps taken from the same source.

I would like to thank Mr. Scase for his comments on the identity of some of the cowries depicted on stamps.

CATALOGUE OF COWRY STAMPS

Country	Cat. No.	Year	Species depicted	Value	Price	Fig.
Afars and Issas	571	1972	<u>C. pantherina</u>	9f	5p	8
Aitutaki	101	1974	<u>C. talpa</u>	4c	5p	4
	108b	1975	<u>C. hesitata</u>	£5	£4.25	-
Angola	715	1974	<u>C. stercoraria</u>	2e	8p	-
Antigua	320	1972	<u>C. cervus</u>	5c	10p	1
Comoro Islands	114	1971	<u>C. caputserpentis</u>	60f	15p	2
Cook Islands	473	1974	<u>C. caputserpentis</u>	6c	8p	3
	484	1974	<u>C. caputserpentis?</u>	£4	£4.00	-
Cuba	1385	1966	<u>C. cervus?</u>	2c	5p	7
Fiji	383	1968	<u>C. aurantium</u>	3/-	50p	5
	403	1969	<u>C. aurantium</u>	30c	30p	-
	477	1972	<u>C. aurantium</u>	30c	45p	-
Gilbert & Ellice Islands	219	1972	indet. cowries	10c	20p	-
	-	-	<u>C. argus</u>	4c	-	-
	-	-	<u>C. cribraria</u>	10c	-	10
	-	-	<u>C. talpa</u>	25c	-	-
	-	-	<u>C. mappa</u>	35c	-	-
Kenya	243	1971	<u>C. mauritiana?</u>	20c	5p	6
Maldiv Islands	31	1952	stylised	5l	8p	-
	53	1960	stylised	5l	5p	11
	-	-	(haven't seen stamp)	60l	-	-
New Caledonia	449	1968	<u>C. cribraria</u>	10f	12p	13
	452	1968	<u>C. talpa</u>	21f	25p	-



1



2



3



4



5



6



7



8



9



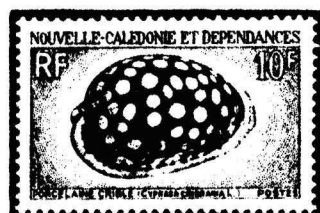
10



11



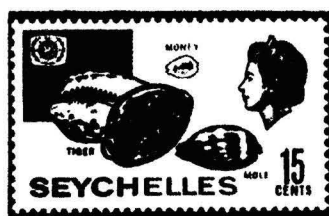
12



13



14



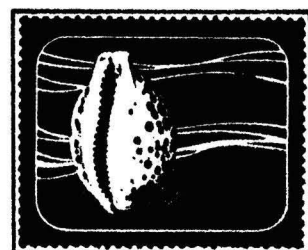
15



16



17



18



19



20

	455	1968	<u>C. argus</u>	33f	40p	12
	460	1968	<u>C. mappa</u>	60f	80p	-
New Hebrides	162	1972	<u>C. fischeri</u>	25c	8p	9
North Vietnam	N610	1970	indet.	20x	12p	17
Papua & New Guinea	6	1952	cowry necklace	3 ¹ / ₂ d	25p	14
	6a	1958	cowry necklace	3 ¹ / ₂ d	£1.00	-
Seychelles	242	1967	<u>C. tigris</u> , <u>C. talpa</u> & <u>C. moneta</u>	15c	5p	15
Togo	368	1964	<u>C. stercoraria?</u>	3f	5p	16
Tokelau Islands	41	1974	<u>C. mauritiana</u>	3c	5p	-
	42	1974	<u>C. tigris</u>	5c	5p	18
	43	1974	<u>C. talpa</u>	15c	15p	-
	44	1974	<u>C. argus</u>	25c	30p	-
Umm al Qiwayn	no no.	1972?	"Little warty cowry"	5dh	-	19
Wallis & Futuna Islands	178	1962	indet.	20f	60p	20

REFERENCES

- ANONYMOUS 1975 Stanley Gibbons British Commonwealth Stamp Catalogue 1976. London (Stanley Gibbons), 890 pp. (£5.50)
- ANONYMOUS 1975 Stanley Gibbons Stamps of the World 1976 London (Stanley Gibbons), 1444 pp. (£7.00)

A. J. Rundle

WEST AFRICAN CONES

One of the areas of the world which is most poorly covered by any literature on Mollusca is the West African province. Many species from the Mediterranean are found outside the Straits of Gibraltar along the coast of Morocco and south to Senegal; Conus mediterraneus Hwass is an example. Some shells found off the coast of South Africa are also found further north. These are covered by literature on these respective areas, but the vast area in between raises many problems. Some species are found here which are also found on the other side of the Atlantic, and some are closely related, for example Cypraea spurca L. and C. spurca acicularis Gmelin.

Although cones are very popular among collectors, those from West Africa need a great deal of work to be done on them. Classification is difficult, and changes in nomenclature are not uncommon. The world's largest cone, C. pulcher Lightfoot has for long, and until very recently, been known as C. prometheus Hwass. C. papilionaceus Hwass was thought to be a closely related but separate species, but is now believed to be one and the same species. A specimen of C. pulcher 222mm. (8.8") is on record.

For a long time C. litoglyphus Hwass (not infrequently mis-spelled lithoglyphus) was thought to be synonymous with C. ermineus Born; see Rippingale & McMichael's "Shells of the Great Barrier Reef" and Tinker's "Pacific Shells". C. litoglyphus however is an Indo-Pacific species. Van Nostrand's Standard Catalogue of Shells says of C. ermineus "Not C. litoglyphus Hwass. Beware of identification."

C. ermineus has recently been shown as being found on both sides of the Atlantic. To confuse the issue, it has long been called C. ranunculus Hwass with a large number of synonyms, the senior of which is C. testudinarius Hwass. However C. ranunculus is an Indo-Pacific species, smaller than C. ermineus, and sold in the Philippines, as well as often incorrectly labelled, as C. nigropunctatus Sowerby. C. nigropunctatus is a Red Sea species quite different from both C. ermineus and C. ranunculus. The August 1969 issue of 'Hawaiian Shell News' carried an excellent article by John Holeman and Ormond McGill on C. ranunculus, and Cernohorsky correctly describes it in his "Marine Shells of the Pacific".

The Atlantic cone formerly called C. ranunculus has recently been called by its senior synonym C. testudinarius Hwass, but since it has been shown to be C. ermineus Born, an earlier name, that takes precedence. It is so

described by Tucker Abbott in his new edition of "American Sea Shells".

Apart from specimens of C. ermineus from Trinidad, Senegal, Fernando Po and Angola, I have a number of small cones from various West African localities which appear to be close to, if not identical with, C. ermineus. One is labelled C. algoensis Sowerby. Brian Kensley in his "Sea Shells of Southern Africa", illustrates C. scitulus algoensis Sowerby from Table Bay to the west coast, C. scitulus scitulus Reeve from Hermanus to Cape Agulas, and C. scitulus simplex Sowerby from False Bay. He does not mention C. ermineus. Van Nostrand lists C. scitulus, C. algoensis and C. simplex all as good species. I have a cone from Angola labelled C. ambiguous Reeve (Van Nostrand says this may be a synonym of C. suturatus Reeve, an Indo-Pacific species) which looks very much like my specimen of C. simplex from South Africa.

I have a cone from Fernando Po in which the legend, sadly unsigned, reads "Conus africanus Kiener (much controversy over this but believe that eventually this will prove to be C. ermineus Born with synonyms C. testudinarius, C. africanus and a few others. A variable shell.) Collected December 1968 1-3 fathoms - under rock Fernando Poo (sic)." This shell is 27.7mm. long and certainly looks exactly like C. ermineus. I believe the above collector's remarks were well founded.

I have three shells labelled C. guiniacus Hwass (Van Nostrand says this may be a synonym of C. guineensis Gmelin and is an Indian Ocean species). One is from Luanda, one from Lobito (both in Angola) and one without locality data. I also have one labelled C. guiniacus Gmelin from the Canary Islands. Three bear considerable resemblance to a small C. ermineus, and the specimen from Lobito to another cone I have from Angola labelled C. lirepunctata (no author). I have been unable to trace any reference to this last name, but it is certainly not inappropriate.

Another cone in my collection is labelled C. bulbus Reeve which Van Nostrand says may be a synonym of C. zebroides Kiener, although he gives the locality of the former as West Africa and of the latter as Australia!

Other cones from West Africa include C. grayi Reeve (which, if a good species, must be closely related to C. ermineus); C. mercator L., a species which from the many specimens which John Orr collected recently in Gambia, has surprisingly varied markings; C. venulatus Hwass and C. genuanus L.

A. P. H. Oliver
Appropriately, 1st. April 1975

COLLECTING TERTIARY FOSSIL MOLLUSCS IN SOUTHEAST AUSTRALIA

When in Australia from 1969 to 1972 I somehow drifted into collecting fossil molluscs, mainly in Victoria, and this opened my eyes to the often extraordinary richness of the Tertiary deposits exposed in southeast Australia. This account, therefore, is an attempt to give readers an idea of this richness. It is not meant to be an authoritative description of the Australian Tertiary, being based as it is on my sketchy reading of others' work and my own collecting experiences, and any errors in it are mine.

Marine Tertiary deposits occur over a wide area in southern Australia, from West Australia, fringing the Great Australian Bight, in the Murray basin of South Australia and northwest Victoria, in a small area of north Tasmania, and in southern Victoria, with interruptions, as far as the eastern, Gippsland, portion of that state. Although Miocene deposits are the most widespread the Paleocene to the Pleistocene is represented and rich molluscan faunas have been found at most of these levels. A variety of fossil ecotypes are involved and hence a mixture of rocks, predominantly limestones, but also clays, silts, sands and sometimes sandstones. Fossils of many phyla occur but the most varied faunas are found in clayey beds which, typically, were laid down in the fairly deep water of the mid-continental shelf and often contain many beautifully preserved molluscs; it is with beds such as these that this article is concerned.

The discovery of marine Tertiary fossils in southeastern Australia dates from the mid-nineteenth century but although some molluscs were named as early as 1845 (Umbilia eximia (G.B.Sowerby) from an un-rediscovered type locality) little was done about describing the fauna until about 1860 after which date several workers, especially Prof. Frederick McCoy, the Rev. Julian Tenison-Woods, and Professor Ralph Tate in Australia, G. F. Harris at the British Museum (Natural History) and M. Cossmann named a large number of species. In the first half of this century other workers such as F. Chapman, G. B. Pritchard, F. A. Singleton and the Rev. E. H. Chapple described a few more molluscs, while F. A. Schilder revised the Cypraeidae in 1935 and in 1944 Dr. A. W. B. Powell revised the Australian Tertiary Turridae. More recently Dr. N. H. Ludbrook has monographed the Pliocene fauna found under Adelaide and T. A. Darragh of the National Museum of Victoria has revised the Columbariidae, some Crassatellidae and the sub-family Athletinae of the Volutidae. The bulk of the species described are from the Upper Oligocene, Miocene, and Pliocene, but especially from the prolific Middle Miocene (Balcombian) and much of the fauna is still un-named. It is still easy for anyone to collect undescribed species even from sites that have been known for a hundred years or more, especially by washing samples for small specimens.

The earliest Tertiary molluscan faunas in southeast Australia are found along the Victorian coast just west of the end of the Bass Strait; there are at least two Upper Paleocene assemblages - from the Pebble Point Grit and the Rivernook Member of the Dilwyn Clay. These faunas, which came from the then narrow sea between Australia and Antarctica, are virtually undescribed, although Athleta wangerrip Darragh 1972 is from the Rivernook Member.

Eocene assemblages are found at a few localities in the Otway region of Victoria, and south of Adelaide in South Australia. Lonely cliffs between the Johanna River (which one has to wade) and Brown's Creek about 140 miles west of Melbourne have two washouts cut through blown sand to the Eocene Brown's Creek Clay. Three faunas have been identified in the exposed part of the Brown's Creek Clay, the lowest of which is Middle Eocene. The upper fauna, BC3, contains abundant "Turritella" and a large variety of other species, often frustratingly cracked in situ. It is Upper Eocene in age, and species in it, e.g. of Turridae, can be matched with the fauna of the creamy brown Blanche Point Marl, exposed at the locality so named near Aldinga some 20 miles south of Adelaide, where a bed full of Turritella is also conspicuous with a fairly varied fauna rather thinly scattered above it. The Blanche Point locality has been known, and fossils described from it, for eighty or more years, but was, in common with most of the southeast Australian Tertiary, not securely fitted into the global geological timescale until the work of F. A. Singleton in the first half of this century.

Singleton's studies also dated as Uppermost Eocene or early Oligocene a locality near Cape Otway, Victoria, known to Tate and earlier workers as Point Flinders or Cape Otway, and now as Geological Survey of Victoria locality AW1. Here again is a well-preserved, part described, fauna in which some shells (Ternivoluta curvicostata Darragh 1972) may exhibit traces of colour-banding. Unfortunately AW1 was a locality which I did not get round to visiting.

With the exception, perhaps, of the AW1 fauna no Lower or Middle Oligocene assemblages are known from southeast Australia. The succeeding Upper Oligocene and later faunas show a warming of the seas to above their present level with an optimum at about the Middle Miocene followed by a gradual and irregular return to conditions similar to the present day.

The coast west of the Victorian resort of Torquay (itself some 60 miles west of Melbourne) shows sections in a series of Oligocene to Lower Miocene deposits. Oldest is a marine clay development of the Angahook Formation where, almost as usual, "Turritella" spp. are abundant; other fossils present, mostly gastropods, include volutes and fragments of the earliest giant cowries for which, perhaps, the southeast Australian Tertiary deposits are most famous. Above this and separated by a stratigraphical break occurs the very large fauna of the Jan Juc Marl, a lateral equivalent of the Point Addis Limestone. A contemporaneous fauna is found at Table Cape, near Wynyard, North Tasmania. Molluscs from the Jan Juc Marl, which is regarded as very late Oligocene, labelled variously Torquay, Spring Creek, or Bird Rock Cliffs are

in many institutions including the BM(NH), often collected by F. A. Cudmore who was not daunted by having to use mountaineering techniques when necessary to get his specimens. On the whole the fauna looks very similar to that of the succeeding Miocene; it includes such things as Turritellidae, Eotrigonia semiundulata (McCoy 1866), Conidae, the small volute Ternivoluta anticingulata (McCoy 1866), an Umbilia cowry, U. platyrhyncha (McCoy 1876), and many turrids, for example Cochlespira venusta Powell 1944 and a number of genera with New Zealand affinities. At the top of the Jan Juc Marl is a rather gritty grey clay full of pelecypods, the Chione Bed, and Lower Miocene deposits follow.

The Lower Miocene of the Longfordian stage (after Longford south of Geelong) is not widely exposed in Victoria. There is a fairly thick clay, the Puebla Clay, above the Jan Juc Formation in the cliffs near Torquay which has fossil molluscs scattered rather thinly through it. A prolific and later Longfordian mid-shelf fauna can be collected from landslip exposures of the lower mollusc horizon of the Fishing Point Marl near Lake Costin in the Otway region. The molluscs, naturally, have links with the Jan Juc Formation and with later faunas and include a rich variety of small species which can be found by clay washing.

Like the Longfordian, fossil localities in the Batesfordian (early Middle Miocene) seem to be few. One of the best is in a roadside cutting of aptly named Gellibrand Clay near the small settlement of Kennedy's Creek in west Victoria. Here it is possible to collect a vast variety of gastropods - muricids, volutes (such as Volutoconus ralphi (Tate)), cowries and cones, and perhaps 50 turrid species - but a relatively poor selection of lamellibranchs. The Gellibrand clay, about 1000 feet thick outcrops in an area west of the Otway ranges in Victoria and various localities, often road cuttings, have produced Middle to Upper Miocene assemblages. A marl lens in a Miocene limestone area at Cadell near Morgan on the banks of the Murray in South Australia has produced a fauna of roughly the same age as Kennedy's Creek.

If you wish to collect really spectacular and beautifully preserved molluscs then exposures in the Balcombian Middle Miocene are the thing to go for. Of these the most famous are at Fossil Beach, Mornington, some 30 miles south of Melbourne, and in the banks of Muddy Creek near Hamilton in western Victoria. At Fossil Beach, alias Hobson's Bay, alias Schnapper Point, alias Mornington, alias Balcombe Bay, and now partly covered with a sea wall and car-park by an enlightened local authority, is some 35 feet of blue-grey Balcombe Clay; layered in this is a profusion of molluscs, bryozoa, corals, foraminifera, fish otoliths and other fossils. There is no up-to-date 'score' for the number of molluscan species, but there must be something over 500. Even now, when the sea wall reduces the chance of finding the larger species, collecting at Fossil Beach can be extremely rewarding - it is also extremely popular. An equally rich, but often more re-worked, fauna occurs at Clifton Bank on Muddy Creek; it is slightly later than that at Fossil Beach. The fossils indicate quite a mixture of ecotypes - cliffs with deep water close in have been invoked to explain it. Other Balcombian exposures are found in the Gellibrand Clay, and in the Fyansford Clay near and to the west of Geelong, Victoria.

The Balcombian fauna represents perhaps the acme of the warm water assemblage which appeared first in the southeast Australian Oligocene. Gastropod shells are often highly ornamented and there is a tendency to produce large-sized species - Gigantocypraea spp. 16 cm. long, Trivia avellanoides McCoy 25mm. long, large turrids and even a 40mm. triphorid (Triphoris sulcata Tenison - Woods 1879); many families have a large number of species in them, the Turridae of course, but also many volutes (Ternivoluta, Notovoluta, Pterospira, Notopeplum, etc.), cones (Victoria now has only three, one of which is common), Pyrenidae, Cypraeidae, something like 20 Triphoridae, Marginellidae, Turritellidae, Muricacea where there is a conspicuous development of Columbariidae, and many opisthobranch 'bubble shells'. At many localities the pelecypod fauna is numerous in individuals but more restrained in species. As today in off-shore waters off southern Australia, 'taxodonts' seem to be the most abundant, especially Cucullaea corioensis McCoy, small arcids, Sacella spp., Limopsis spp., Glycimeris spp., Nuculidae and minute species of Cosa and Lissarca; in addition the Crassatellidae, Veneridae, Carditidae, Pectinidae, and Corbulidae are well represented. Most localities produce few chiton species, perhaps because of the unsuitability of the bottom

conditions. Scaphopods are common but do not seem to have been fully described. Nautiloid cephalopods include a late appearance of Aturia.

Although the next stage of the Australian Miocene is named after Bairnsdale in the east of Victoria, the molluscan collecting localities are nearly all west of Melbourne, a notable exception being Grice's Creek, now difficult of access, a few miles north of the Fossil Beach site. As for the Balcombian, various sections are known in the Fyansford and Gellibrand Clays of west Victoria, and in the Muddy Creek Formation, and much of the limestone stretching across South Australia and in west Victoria is of about this age as the epicontinental seas off southern Australia reached their maximum extent then. Other Bairnsdalian localities include Routledge's Creek near Port Campbell, west Victoria, where a development of marl in the Port Campbell Limestone has produced many molluscs, which, as in some Fyansford Clay localities, contain a lot of salt and are liable to disintegrate unless treated, and Lake Bullenmerri, near Camperdown, also in Victoria. Here fossils can be collected from un-metamorphosed clay around the edge of a volcanic explosion crater (a maar) as the (probably) Pleistocene activity was so short and violent that it simply created a hole, surrounded by a cone of debris, through the underlying rocks. Lake Gnotuk which is part of the same complex shows the same features.

On the whole a rich mid-shelf fauna as in the Balcombian persists, but some more modern forms appear - at Lake Bullenmerri for instance the living pelecypod genus Neotrigonia occurs along with the Oligocene to Miocene Eotrigonia - and in many cases shells have sufficiently altered from Balcombian forms to merit separate specific or subspecific status.

The uppermost Miocene in Australia is called the Cheltenhamian stage after a southern Melbourne suburb where cliffs at Beaumaris formerly produced a shelly fauna; the only slightly older 'Mitchellian' site I have read of is at Rose Hill in east Victoria. Most of the localities where Cheltenhamian fossils can be collected are exposures in the Jemmy's Point Formation of Gippsland, Victoria. The fauna is of somewhat cooler type than earlier in the Miocene, and in Gippsland some shallowing of the sea is indicated. Genera such as Ternivoluta and Columbarium disappear from the fossil record in southern Australia after this.

By the Pliocene the seas covering parts of what is now southern Australia had shrunk considerably in extent and deposits mostly indicate shallow conditions. In South Australia Pliocene deposits are found near Adelaide; the Dry Creek Sands actually underlie that city but are only known from boreholes. They have an extensive molluscan fauna. Another area where Pliocene deposits occur, but are usually only exposed in excavations such as for farm irrigation tanks, is on Flinders Island in the Bass Strait. Victoria has shelly Pliocene deposits in the Grange Burn Coquina, exposed in creek banks in the same general area as the Muddy Creek Marl near Hamilton, and in the upper part of the Jemmy's Point Formation in east Gippsland. The molluscs were starting to resemble more closely those of the region today, and the Miocene 'exotics' such as large cones and cowries have disappeared although a large Cucullaea, C. adalaidensis Tate 1886, is still common in some places. I only managed to acquire limited field experience of these Pliocene fossils, in the Jemmy's Point Formation at Kalimna Jetty near Lakes Entrance where the beds had large numbers of Turritella; the large pelecypod Eucrassatella kingicoides (Pritchard 1903) was conspicuous, and other molluscs included struthiolariids, trochids (Bankivia howitti Pritchard 1904), and Neotrigonia howitti (McCoy 1875), often more or less rolled.

It is not intended to devote much space here to Pleistocene fossil mollusc faunas in southern Australia; they are known on the Roe plains of West Australia, for example, and in Victoria in the lower Glenelg valley, and round the head of Port Phillip Bay, but they do not seem to be fully described.

What happened to the southern Australian Tertiary Mollusca as exemplified by the Miocene fauna? Some elements became extinct; others have survived quite recognisably, mostly outside the Indo-Pacific region, from off-shore New South Wales to West Australia. Among the gastropods the well-known Umbilia hesitata (Sowerby) has generic roots in the Upper Oligocene and Miocene; there is one living representative of the various Austrocypraea spp. (type the Balcombian A. contusa McCoy 1877); the 'cold water' cowries, Zoila spp. go

back to at least the Middle Miocene; a living species of the cymatiid genus Austrotriton (which has a variety of Oligocene-Pliocene species) has been recorded off New South Wales, and volutes Pterospira roadknightae (McCoy 1881) (c.f. P. hannafori (McCoy 1866) of the Middle Miocene) and two species of Notopeplum can be regarded as survivals. It also appears from recent discoveries (Wilson 1972) that mid-shelf waters off the central West Australian coast shelter some of these 'Tertiary relicts' including Notovoluta pseudolirata (Tate 1888) previously only known as a Middle Miocene fossil. Less spectacularly, many southern Australian marginellids resemble fossil ones, as often do Triphoridae, and among turrids, Asperdaphne seems to originate in the Upper Eocene, so possibly does Splendrillia, while the puzzling Teleochilus goes back at least to the Upper Oligocene. Somewhat similar stories are met with among the bivalves - Neotrigonia has already been mentioned; Eucrassatella also goes back to the mid-Tertiary and deep water Arcidae, Nuculidae and Limopsidae from southern Australia look very similar to those of Eocene-Miocene deposits from that part of the world.

So, much remains to be done in exploring the Tertiary marine molluscan faunas of Australia, and anyone with the interest and opportunity can do a great deal of useful work on them at any level.

David Long

Selected References

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- DARRAGH, T.A., 1970. Catalogue of Australian Tertiary Mollusca (Except Chitons); Mem. Nat. Mus. Vic. 31: 125-212 (includes listings of major publications on the Australian marine Tertiary to that date)
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NOT EVERYBODY LIKES SHELLS

Incredible as it may seem, there are people who regard the absence of shells on a beach as an added attraction!

The official guide-book to Trinidad recommends, inter alia, a visit to Maracas Bay on the Northern coast of the island. After extolling the scenic beauties encountered during the run from Port of Spain to the locally famous beach, the chapter ends with this astonishing paragraph:-

"Suddenly the road straightens and with a left turn the sea once more appears in sight, lapping its white sandy, shell-less shore as the coconut trees swing and sway to the delight of your presence."

One almost detects here the author's quiet pride at being able to offer this special amenity to the visitor.

We were fortunately undeterred and found the trip to be all the guide-book had said and more. The bay itself is superb and it must be admitted that shells were a bit thin on the ground; few enough, in fact, to be overlooked by the non-conchologist. In spite of this we found, during the delightful few hours spent there, about five different species out of the fairly numerous Fissurellidae of the area and several species of recently deceased bivalves. The rocks and rock pools at the eastern end of the beach, however, were inhabited by substantial colonies of the more common littoral species one might expect to find on a Caribbean shore, including very large specimens of Chiton squamosus Lin. and Acanthopleura granulata (Gmelin).

Our visit to Maracas turned out to be, from every point of view, a worthwhile experience.

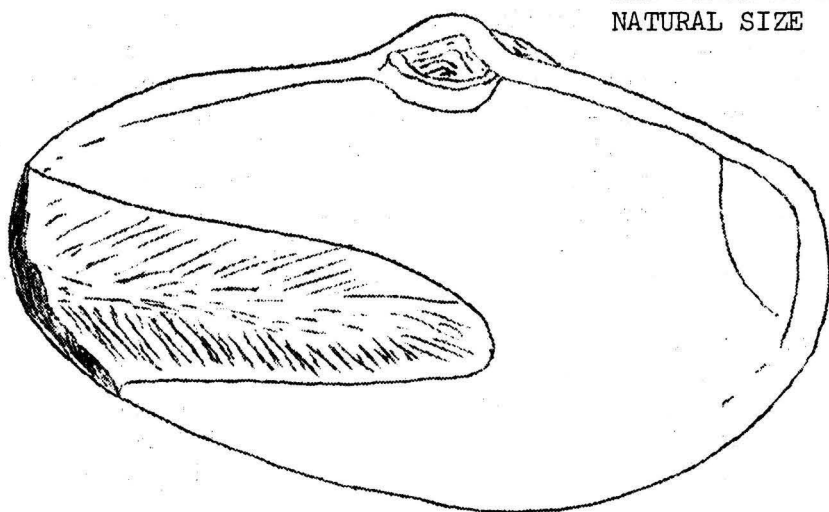
R. Fresco-Corbu

The shell was found in a channel lag deposit of a tidal salt marsh near Faversham, Kent, during sedimentology field-work for my final exams in September 1974. The shell is well worn and appears normal except for two very distinct features. The first and most obvious abnormality is the greatly swollen area of the palial sinus: that is, instead of a very slight depression in this area, a layer of the shell material has expanded so that the palial sinus forms a hump rising to 11.5 mm. above the normal level. Therefore, this feature is a very large abnormality relative to the shell size. The area between the outer surface of the shell, which is normal, and the layer forming the palial sinus is hollow: a *Cliona* sponge-boring penetrates this hollow from the outside and this may have provided a source of irritation directly, or permitted another source of irritation to enter in between the layers of the shell and cause the abnormality. This idea is the only one I have to explain the feature.

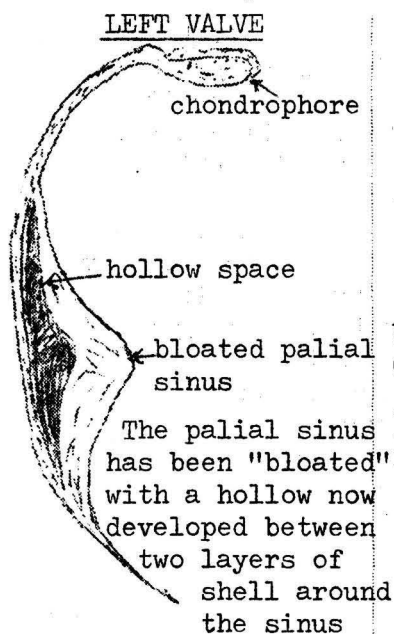
The second feature is the existence of a series of distinct "teeth" on the undersurface of the chondrophore. These are found in a row and resemble an unusual form of dentition, but they cannot be teeth and appear to have no purpose.

The occurrence of these two abnormal features on the same specimen of *Mya arenaria* appears to provide an unusual example of defects in the lamellibranch shell and may warrant study by an interested conchologist. Unfortunately, photographs do not illustrate the features very well and so I have included several diagrams. Also, I only found the left valve; the right valve may explain how the poor creature got his sinus out.

THE DIAGRAMS ALL APPROXIMATE TO
NATURAL SIZE



THE LEFT VALVE OF THE
ABNORMAL *MYA ARENARIA*



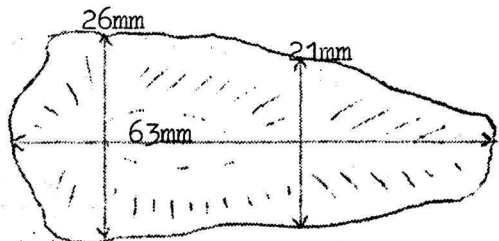
LEFT VALVE CHONDROPHORE



UNDER-SURFACE OF THE
CHONDROPHORE



AS SEEN FROM ABOVE



DIMENSIONS OF THE EXPANDED
PALIAL SINUS

CROSS SECTION



A. Watters

SHELLS - An illustrated Guide to a Timeless and Fascinating World by Mary Saul, Country Life, London, 1974, £3.50.

The shell collecting public can be divided roughly into two genera: the shell collector and the Conchologist. The genus "shell-collector" is solely interested in collecting shells, preferably pretty ones, identifying, classifying, labelling and "housing" them with the final objective of contemplating their beauty (or plain gloating over them). This genus is further subdivided into "species" or specialists in one or other of several shell families such as the cone-ists, the cowry-ists, the olivists and muricists. It is for these shell collectors that the majority of shell books have been written giving name, description, size and region of each species but no more; and that is all a shell collector wants to know.

The genus "conchologist" on the other hand may do all the things the plain collector does - though there are conchologists who do not own a single shell - but in addition he takes an interest in the "shell maker" as well as its habits, ecology and place in the civilization of mankind. Alas, the number of books dealing with all these subjects is sadly small. They are either written in the secret language of the few initiated and not comprehensible to the amateur conchologist, or they are rare and unobtainable, or they just do not exist at all. In fact, it is most probably because of the dearth of such comprehensive shell literature that shell collectors have not ventured outside the narrow confines of their collections.

Mary Saul's book "SHELLS" must therefore be considered a most laudable pioneering attempt at both, satisfying the curiosity of the conchologist and opening up some surprising vistas to the shell collector. A mere glance at the table of contents rouses one's curiosity: "...Magic, Mythology and Religion - Shells as Currency - Use and Ornament - Commercial Products - Food for Man - The Helpful and the Harmful - Art and Craft..." with each new subject the reader's anticipation grows - and he will not be disappointed. At the end of each chapter he is left with that peculiar feeling of hunger for more - more information on a fascinating topic. But the author herself knows that each chapter would warrant a book, and sometimes volumes could be written on one particular aspect of the mollusc. Not infrequently one wonders where a certain piece of information was culled from and a fuller bibliography would have been of great value to readers with specific interests they would wish to pursue. But the amount of reading and note-taking that went into the collecting of the material for this book must have been prodigious and can only be appreciated by someone who is engaged in similar work, for often one has to plough through a whole book to find just one piece of useful information, since compilers of indices mostly ignore shells and facts related to them.

The title "SHELLS" is of course quite misleading, for the beholders first reaction is "Ah, another shell book", but this is not "another shell book" for there is no other like it. Some title like "Man and Shells" or "Mankind and the Mollusc" would have been more indicative of the book's scope, for it really is a treatise on the impact of the mollusc on man's thought and belief, inventiveness and creativeness and its place in the evolution of Mankind.

The flawless shell book has yet to be produced, and in a work of this magnitude of range and comprehensiveness, mistakes are likely to occur. Having explored the beaches of Bengal, I could not help stumbling over the information of "Portuguese ships laden with rice from Cochin China, sailing to Bengal to exchange their cargo for cowries." (p. 80). Alas, there are no cowries to be found on the Bengal shore except a few dead ones, and the shell trade was in fact, in reverse: the Portuguese brought cowries from the Maldives - via Cochin in South India - to Bengal and there exchanged it for rice; for Bengal suffered for centuries from a lack of "small change" and met the deficiency in this way... The mere mention of this "flaw" makes me feel petty and ungracious...

The many illustrations greatly enhance the value of the book though their quality varies greatly from very good (pp. 57-58) to execrable (p. 59); but as many publishers believe they know best what is desirable, the author must be

found "not guilty".

When the reader comes to the end of the book he puts it away with regret - that the story is finished - and wonder - at the unexpected importance of the mollusc in the development of Mankind. Perhaps the work can be summed up in the manner of a dust-jacket blurb: "Mary Saul's "Shells" is an inspiring and edifying book which should be read by every shell collector - a book for which I am most grateful to the author.

Fred Pinn

REVIEW

'The World of Seashells' by Robert Scase and Eric Storey; Osprey Publishing Limited, 1975. xxii pp., 106 plates. £2.95.

The conchologist as such lives in a world radically different from that of fifteen or twenty years ago, before the popularisation of 'leisure activities'. In those days, for instance, the collector of tropical marine shells (in particular) had very little to assist him in the way of literature apart from the rare, the out-of-date and the very expensive; but the proliferation of such things as skin diving and the consequent increase in shell collecting in the U.S.A. have brought with them, both there and here, a flush of 'coffee-table' books on beautiful shells and now, not a year passes without a book of the kind being offered to the public - always in the confidence that no enthusiast will wish to be without it. Apart from their artistic aspect, many of these books are of a good deal of scientific value, but the trouble is that the number of outstandingly attractive species is not unlimited, and certain of them are so popular that their inclusion is a matter almost of necessity if the book is to find a ready sale. Hence most of the books have to ring the changes among the most popular genera and the larger part of the molluscan world remains ignored. The inclusion of many bivalves or non-marine shells for instance, would be most unwise, since all of these continue to be rejected by the average American collector, and it is undoubtedly he who will have to be tempted.

It will be seen, therefore, that the authors can rarely be guided by their personal enthusiasms, and much of what they include is compulsory matter, however much overlapping it produces. In the present instance, Scase and Storey have trodden their narrow pathway with skill and while including many of the old favourites, have managed to find a fair proportion of species which, even though of the popular genera, have been rarely photographed before. Cowry, Cone and Murex rule the commercial scene, and together take up 33 out of the 106 plates in the book; the bivalves are allotted eight and the landshells three - the usual green Papustyla, Liguus and Polymita. One still awaits the appearance of a Melanid or a freshwater mussel in any such work, although they can be equally as colourful and shapely.

The illustrations are excellent, relying as they do upon first-class straightforward colour-photography without attempting any artistic angles. Each shell is taken against a plain black background which in nearly all cases produces most effective results; the high-lights show up too, in a more natural way than is usually the case. The explanation which goes with each plate is lucid and to the point. There are a few pages by way of introduction to the Mollusca, the plates follow, each with its commentary starting with dimensions and localities. These notes are of very practical use and it will be very few collectors who do not pick up many facts previously unknown to them; for instance it is stated that whereas Spondylus attaches itself to the substrate by its right valve, Chama nearly always uses the left. The legend of the Chinese forgeries of Epitonium scalare is repeated, but it would be interesting to know the origin of this, and whether anybody has ever seen an example. The aberrant growth of Brechites is well described, but it is a pity the photograph was unable to pick up the bivalve shells in their position on the tube.

The production of the book is a credit to those responsible, and it is a pleasure to note that printing and colour work of such quality can still be

produced in this country; it is at least the equal of any of the foreign processing so often seen in recent years. The book shows care and craftsmanship on the part of authors, publisher and printer alike and if there are any errors, either of fact or of printing, the reviewer did not find them.

The book is unusually good value.

T. E. Crowley

SUMMARIES OF RECENT OPINIONS AFFECTING MOLLUSCA RENDERED BY THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

Bull. zool. Nomencl. 30, part 1, 6 July 1973

Opinion 996. Acanthopleuroceras Hyatt, 1900 (Cephalopoda, Ammonoidea): designation of Ammonites valdani d'Orbigny, 1844, as type-species; Ammonites natrix Schlotheim, 1820 suppressed for the purposes of Priority but not for Homonymy.

Bull. zool. Nomencl. 30, parts 3/4, 28 June 1974

Opinion 1003. Orthoceras Bruguiere, 1789 (Cephalopoda), with type-species Orthoceratites regularis Schlotheim, 1820, placed on Official List; suppression of Orthoceros Brünnich, 1771, and Orthocera Modeer, 1789; placing of Orthoceras of Batsch, 1791, Spalovsky, 1795, Schrank, 1796, Perry, 1811, Blainville, 1825, Deshayes, 1831, Phillips, 1836 and Balashov, 1956 on the Official Index of rejected and invalid names.

Opinion 1009. Vanikoro Quoy & Gaimard, 1832 (Mollusca, Gastropoda) ruled under the plenary powers to be an available name, to be feminine in gender, and to form the family-name VANIKORIDAE. Its type-species is Sigaretus cancellatus Lamarck, 1822, by monotypy. Vanicoro Gray, 1842, Vanicora Paetel, 1887, Vanikora Whitfield, 1891, Vanikoroia Martin, 1914 and Vanikoroa Cossmann, 1924, are ruled invalid.

Bull. zool. Nomencl. 31, part 1, 31 July 1974

Opinion 1014. Okenia Menke, 1830, (Mollusca, Opisthobranchia) declared available, with type-species Idalia elegans Leuckart, 1828. Suppression of Idalla Ørsted, 1844; quadricornis, Doris, Montagu, 1815; and caudata, Idalla, Ørsted, 1844.

Bull. zool. Nomencl. 31, part 3, 20 September 1974

Opinion 1020. Pleuroacanthites Canavari, 1883 (Mollusca, Ammonoidea) given Ammonites biformis J. de C. Sowerby, 1831, as type-species under the plenary powers.

Opinion 1023. Cassis Scopoli, 1777, with type-species Buccinum cornutum Linnaeus, 1758, ruled to form the family-name CASSIDAE. (Cassida Linnaeus, 1758, in Insecta, forms CASSIDIDAE)

Bull. zool. Nomencl. 31, part 4, 31 December 1974

Opinion 1030. Cylichna Loven, 1846, type-species Bulla cylindracea Pennant, 1777, placed on the Official List. Cylindrella as used twice in different senses by Swainson, 1840 (with type-species Conus costatus Chemnitz, 1795, and Cylindrella alba Swainson, 1840, respectively) suppressed under the plenary powers.

Bull. zool. Nomencl. 32, part 3, 22 September 1975

Opinion 1040. Oniscidia Murch, 1852, with type-species Oniscia cancellata G.B. Sowerby II, and Morum Rüdiger, 1798, with type-species Morum purpureum Rüdiger, 1798, placed on the Official List. Oniscidia

Swainson, 1840, and Gray, 1847 (incorrect subsequent spellings of Oniscia G.B. Sowerby II, 1824) placed on Official Index.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE
ANNOUNCEMENT A.N.(S.)97

Required six months' notice is given of the possible use of plenary powers by the International Commission on Zoological Nomenclature in connection with the following names listed by case number: (see Bull. Zool. Nom. 32, part 3, 22nd September, 1975).

1780. TETHYIDAE Fischer, 1886 and APLYSIIDAE Pilsbry, 1895-6 (Gastropoda): designation of type-genus.
2083. Simrothiella Pilsbry, 1898 (Mollusca, Solenogastres): designation of type-species.
2106. Cossmannella Mayer-Eymar, 1896 (Mollusca, Bivalvia): designation of type-species.
2121. Microdryas Laseron, 1950 (Mollusca: Gastropoda): designation of type-species.

Comments should be sent in duplicate, citing case number, to the Secretary, International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London, SW7 5BD, England. Those received early enough will be published in the Bulletin of Zoological Nomenclature.

October, 1975

R. V. Melville, Secretary to the International Commission
on Zoological Nomenclature

TERRESTRIAL MOLLUSCA FROM THE ATTENBOROUGH (NOTTINGHAM) NATURE RESERVE

The Attenborough Nature Reserve is situated on the South-East boundary of the City of Nottingham. It is in the flood plain of the River Trent, and consists of a series of lakes and waterways in what was once a gravel quarry, indeed gravel is being quarried adjacent to the reserve at the present time. Not so long ago parts of the reserve were polluted by an influx of water from a nearby canal, however, active steps were put in hand to clear the pollution and ensure that it could not occur again.

In 1960 a report was published which gave a list of freshwater species found in the reserve over the previous five years, the most interesting of which was probably Menetus dilatatus (Gould), which as far as I can find is not included in any reference works as coming from Nottinghamshire, however, to date I have not been able to find any trace of this species and it might be that it is now extinct in the reserve.

The 1960 report listed only three terrestrial species, all slugs, and as no list of terrestrial molluscs has been published, the following list of species found live at Attenborough in 1975 by me may be of some interest.

Arion ater ater (L.)
A. a. rufus (L.)
Limax maximus L.
Agriolimax reticulatus Muller
Milax budapestensis (Hazay)
Carychium minimum Muller
Cochlicopa lubrica (Muller)
Lauria cylindracea (da Costa)
Euconulus fulvus (Muller)

Zonitoides nitidus (Muller)
Oxychilus cellarius (Muller)
O. alliarius (Miller)
Discus rotundatus (Muller)
Hygromia liberta (Westerlund)
H. hispida (L.)
Helix aspersa Muller
Cepaea nemoralis (L.)

R. W. Morrell

GENERAL NOTES

A MESSAGE FROM THE NEWSLETTER EDITOR

I am grateful to the readers who kindly responded to my appeal in the last issue and submitted an interesting variety of items for the Newsletter. Please keep up the good work during the rest of this year! It is particularly helpful to have enough material to build up a 'stock' for forthcoming issues; so please do not be disappointed if your article or note does not appear in this issue. It will certainly be used in the June issue.

WARNING!

Pause, Dear Reader, and think.

Did you send the cheque for your 1976 subscription, as you intended? Did you remember to amend your banker's order?

If you have any doubt at all spend a few minutes in checking - they could save you 50p (or £1.50).

From 1976 the annual subscription rates are as follows:

Ordinary Member	£ 5.00	(£ 15.00)
Family Members	£ 6.00	(£ 18.00)
Junior Member	£ 1.00	(£ 3.00)

but if paid before 31st. March Ordinary Members and Family Members may deduct 50p (£1.50) from the amount of the subscription.

No further publications will be sent to Members whose 1976 subscriptions remain unpaid, although any which have been withheld will be forwarded upon receipt of arrears.

Cheques and P.O.'s should be made payable to the Society and sent to the Hon. Treasurer: Mrs. M. Fogan, [REDACTED], Atherton, Manchester, [REDACTED].

LIFE MEMBERS' FUND

This year, 1976, is, as you will probably know, the Centenary year of the founding of our Society. You will not be surprised to hear that we, like so many similar societies, are now finding things extremely difficult from a financial point of view. Costs of publishing the Journal of Conchology and the Newsletter are, in particular, rising at an unprecedented rate.

It has been suggested that some of our Life Members might like to avail themselves of the opportunity to recognise this milestone by making some contribution to the Life Members' Fund.

INVITATION

The Yorkshire Conchological Society invite Members of the Conchological Society of Great Britain & Ireland to join them at any of their Meetings during Centenary Year. These are in addition to the special joint Meeting to be held at Arkengarthdale during the week-end 17/18 July which is advertised in our Programme of Events. We would like to thank the Yorkshire Society for their good wishes and invitation.

City Museum, Leeds at 2.30 p.m.

March 6th. - B. Colville talks about 'LAND & F.W. MOLLUSCA of CUMBRIA'
October 30th. - Annual General Meeting with an address by J. Armitage

Field Meetings - Details from Mr. E. Dearing, [REDACTED], Read, Burnley, Lancashire, [REDACTED]

April 10th. - Stockmoor & Bretton Park

May 8th. - Allerthorpe Common & Pocklington Canal
 May 29/31 - Stainforth
 June 12th. - Gilberdyke
 June 27th. - Boltby
 July 3rd. - Fishlake
 July 17/18 - Arkengarthdale (joint with Conchological Society)
 September 4th. - Hag Wood Marsh
 October 2nd. - Saltmarshe Delph

STELFOX PAPERS AND JOURNALS

In the October 1975 issue of the Irish Naturalists' Journal, it is recorded that a collection of books, reprints, papers and journals on natural history which belonged to the late A. W. Stelfox has been donated to the library of the New University of Ulster. It is possible that this could contain some material on Mollusca. Anyone interested in using the collection is requested to contact: The Librarian, The New University of Ulster, Coleraine, Co. Londonderry, Northern Ireland.

CORYPHELLA

I am trying to sort out the synonymy of this genus in the British Isles. Would anyone finding specimens please send them to me, together with a detailed sketch of the pigmentation on the body, head and cerata, especially noting the extent of the white pigment present.

Specimens are best preserved by narcotising for 3-4 hours in 7% MgCl₂ solution 50:50 with seawater, fixing in Bouin's fluid, and preserving in 70% alcohol. A simpler alternative is to put the narcotised animal into 10% formalin.

I would be interested in hearing from anyone already working on this problem. Bernard Picton, Ulster Museum, Botanic Gardens, Belfast, BT9 5AB, N. Ireland.

MR. R. N. ELLIOTT, [REDACTED], Nutley, Sussex, has acquired a conchological scrapbook containing a number of early illustrations and engravings - details below - and would be grateful to any member who could give him some more information about these.

A label gives 'Mrs. F. Lutton and Francis Sutton & Co. Norwich'. The fine leather binding has a coat-of-arms. There are some of G. B. Sowerby's 'Conchological Illustrations' Dec. 7th. 1832 and engravings from the Magazine of Natural History 1837. More difficult to date are engravings with French titles in which some words are spelt in an archaic manner which suggests a pre-Revolution origin, e.g. 'Nautilles', 'Aux depens de M^r. l'Abbe de Pompinne, doyen des conseillers d'etat, Commandeur et Chevalier des Ordres du Roy, cy devant son Ambassadeur aupres de la Republique de Venise.'

PUBLICATIONS OF INTEREST

A Handbook to the Natural History of the Lizard Peninsular, compiled and introduced by Dr. F. A. and Mrs. S. M. Turk. Published by the Regional Resources Centre, based at the University of Exeter. Although there are only a couple of pages on the Mollusca, there is much useful general 'background' information on habitats, geology, climate and conservation in addition to a review of the other groups of invertebrates, reptiles, mammals and birds. Cost £1.50 plus 20p post; orders to Mr. V. Wheatley, [REDACTED], Helston, Cornwall, [REDACTED]. Cheques payable to the University of Exeter.

A laboratory study of the haemagglutinating substance from the snail Helix aspersa by Gillian B. Cann, South West Regional Blood Transfusion Laboratory, Bristol; Medical Laboratory Technology, quarterly, vol. 31, no. 1, Jan. 1974.

Abstract - The extract prepared from the albumin gland of Helix aspersa was found to contain a potent agglutinin active against cells bearing the A antigen, a weaker agglutinating substance against B and O cells and a haemolysing substance active in the presence of human serum. The anti-A type agglutinin detected A1, A2, A1 B, A2 B, and enzyme treated Ax cells. It was inhibited by group A blood group substance and the sugars DGalNAc and DGNac. It reacted well over a range of temperatures and pH and has been used successfully as a laboratory reagent. Comparison of this agglutinin with other mollusc agglutinins suggests it to be similar to that extracted from H. pomatia.
(copy of journal from Mrs. S. M. Turk)

BEDFORDSHIRE PLANT ATLAS

The Bedfordshire Natural History Society is hoping that in due course it will publish a 'Natural History of Bedfordshire'. Companion volumes will be in the form of Atlases of various organisms. The first of these will be the 'Bedfordshire Plant Atlas' by Dr. J. G. Dony, Hon. F.L.S., and this is to be published on March 31st. 1976, price £3.00. Distribution of the plants is shown on a Tetrad basis (2Km.)

An Atlas of the Land & Freshwater Mollusca of Bedfordshire is in preparation, as well as an Atlas of Birds, etc.. Any Member wishing to purchase a copy of the Plant Atlas may write to Mrs. E. B. Rands, [REDACTED], Luton, [REDACTED], enclosing a cheque for £3.00.

N.B. Anyone having any localised records of Mollusca for Bedfordshire please send them to me. I am grateful for every scrap of information I can glean. Bedfordshire is a small County when considered Nationally but when one breaks it down into 2Km. squares it suddenly becomes enormous.

E. Beryl Rands

THE SOCIETY'S PUBLICATIONS

Back numbers of the Conchologists' Newsletter may be obtained from J. Collins, The Bookshop, 45 Westow Street, Upper Norwood, London, S.E.19. (telephone: 01-771 9719) at 25p each, or from the Hon. Secretary, Mrs. E. B. Rands, who can also supply copies of the Marine Concordance, 30p to members and 50p to non-members, and can take orders for back numbers of the Journal of Conchology. Papers for Students can be obtained from Dr. A. Rundle.

CENTENARY YEAR LUNCHEON

Members are reminded of the special luncheon to be held at Kettner's Restaurant on Saturday, 24th. April next. Full details were circulated with the December 1975 issue of the Newsletter, but if anyone did not receive, or has mislaid, their copy, then a duplicate may be obtained from the Secretary on receipt of a stamped, addressed envelope.

THE REVEREND CANON C. T. CRIBB, [REDACTED], East Sheen, London, [REDACTED] (01-876 9411) offers the following parts of the Journal of Conchology for sale:-

50p + post/packing

1934	May	Vol. 20	(1)
1956	July	"	24 (4)
1957	Jan.	"	24 (5)
1957	June	"	24 (6)
1960	June	"	24 (11)
1961	July	"	25 (1)
1962	May	"	25 (2)
1962	July	"	25 (3)
1963	April	"	25 (4)

£1.00 + post/packing

1966	March	Vol. 26	(1)
1966	June	"	26 (2)
1967	March	"	26 (3)
1968	Jan.	"	26 (4)
1968	Oct.	"	26 (5)
1969	Oct.	"	27 (1)
1970	April	"	27 (2)
1971	May	"	27 (4)
1971	July	"	26 (6)

1963 Oct. Vol. 25 (5)
1964 June " 25 (6)
1964 Dec. " 25 (7)
1965 Dec. " 25 (8)

1972 March Vol. 27 (5 & 6)
1972 Dec. " 27 (7)
1973 May " 28 (1)
1973 Oct. " 28 (2)

SHELLS FOR SALE

A fine selection of shells for the collector is available at Eaton's Shell Shop, 16 Manette Street, off Charing Cross Road, London, W1V 5LB (telephone: 01-437 9391).

POSITION WANTED

Young, married man seeks a position, e.g. museum or research establishment, in Britain or Overseas, where he can use his knowledge of recent marine bivalves. I have a Joint Honours degree in Geology and Oceanography and am completing my doctorate on the distribution of the living bivalves and their empty valves in Liverpool Bay (Irish Sea). I would be most grateful to hear of any jobs that might be suitable. Peter Lingwood, Geology Department, University of Liverpool, P.O. Box 147, Liverpool, L69 3BX.

SHELL EXHIBITION - THE BRITISH SHELL COLLECTORS CLUB

Society Members are cordially invited to an exhibition at Napier Hall, Hide Place, off Vincent Street, London S.W.1, on Saturday 27th. March 1976. Open to the public from 11.30 a.m. to 4.30 p.m. Admission free, light refreshments available.

COQUILLAGES DU MONDE, Paris

This exhibition closed on 22nd. February 1976 and not at Easter as advertised in the December issue of the Newsletter.

SUBSCRIPTION EXCHANGE REQUIRED

The Senckenberg Natural History Museum would like to exchange a subscription for the 'Conchologists' Newsletter' (£1.25 p.a.) for one of their publications. Anyone interested in making this exchange should contact: Mrs. C. J. Pain, [REDACTED], Millbank, London, [REDACTED]. Telephone: [REDACTED].

SYMPOSIUM 16-17 OCTOBER 1976

The Conchological Society of Great Britain and Ireland, and the Northamptonshire Natural History Society and Field Club will be holding a joint symposium in Northampton to celebrate the centenary of both societies. The symposium will be held in the Humfrey Rooms, Northampton.

There will be eight half-hour sessions, six will be on various aspects of conchology, and two on subjects of natural history other than conchology.

The day will start with morning coffee. At eleven o'clock the Symposium will be opened by Sir Hereward Wake. There will be a one and a half hour break for lunch, the afternoon session will continue until four o'clock when there will be a break for tea. The Symposium will close at five-thirty, when there will be a break for two hours. At seven thirty there will be the Symposium Dinner, after which will be shown the film of the Nautilus, kindly loaned by Jacques Cousteau. For ladies who are not stopping for the night, facilities will be provided for them to wash and change before the dinner.

Accommodation for the Symposium will be provided by the Northampton members, at a charge of two pounds per head for bed and breakfast. This charge has been fixed to avoid any embarrassment on either side.

On the Sunday morning members will be the guests of Sir Hereward and Lady Wake at their home at Courteenhall, close to Northampton.

Proceedings will finish at lunch-time on Sunday so members will be able to get home.

The cost of the Symposium will be about £2.50 per head, this includes morning coffee, snack lunch, afternoon tea, and the dinner at night.

Members who would like to attend are asked to fill in the form below, and send it with two second-class postage stamps to the address shown not later than July 1st. Those members signifying their intention of attending will receive another circular giving more details. A final circular will be sent before the date giving maps, routes, car parks, and train times, as well as a provisional programme.

The Symposium will be limited to eighty people, those who attend can bring exhibits if they wish, space will be provided.

Address to send the form is:-

GORDON OSBORN, [REDACTED], OLNEY, BUCKS, [REDACTED]

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NAME

ADDRESS

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I enclose two second-class postage stamps