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COLLECTORS IN EAST AFRICA - 10. J.M. HILDEBRANDT

J. M. Hildebrandt (1847-1881)

Johan Maria Hildebrandt, born in Düsseldorf on March 19th. 1847, was one of the best botanical collectors ever to go to Africa. He made superb collections with copious duplicates and excellent notes. Very many of the specimens proved to be new and the collections were mainly written up by Wilhelm Vatke (1849-89). He also collected a few molluscs that were mostly dealt with by von Martens in 1878. His journeys were made in order to obtain botanical material not as adventure expeditions. As he put it himself "whilst these [other] explorers push restlessly forward and, as it were, do not let the grass grow under their feet, it was my task to collect this very grass". He was a doctor by profession and made three important journeys - 1872-4, 1875-7 and 1879-81.

His first expedition took him to Eritrea, Aden and Somaliland. From July 1873 to 1874 he was in Zanzibar and also visited the Wami and Kyngani rivers. In 1875 he visited Mombasa, then the Comoro Is., Pangani and Lamu before returning to Mombasa. In 1876 he was ill in Zanzibar but obviously recovered quickly because in November he was back in Mombasa and other parts of the coast. On 10th. January 1877 he set off for Mt. Kenya via Ndara, Ndi and Kitui (much of the track that the present railway and road follow). He collected a number of snails in the Kitui area but never reached Mt. Kenya and returned to Mombasa and Zanzibar in August. In 1879 he made his third and last voyage, this time to Madagascar, and revisited Zanzibar. He died in Madagascar on May 29th. 1881, in the Ankaratra Mountains.

First expedition:- He left Berlin on 5th. March 1872, stayed in Egypt for a short time and then made his way to Aden via Djiddah, Hodeidah and Mochah arriving in June 1872. He made an interesting journey to Massaua in July 1872 in an English battle-ship the name of which I have failed to elicit from naval historical records, and there met Munzinger-Bey who was starting a military expedition to northern Ethiopia in order to occupy the province of Bogos at the behest of Egypt. He invited Hildebrandt to accompany him, which invitation was accepted. From July to October they passed through the provinces of Habab, Bedjuk and Az-Temmariam, Hildebrandt collecting a great many scientific specimens including many new plants. After his return to Massawa he visited the volcanic peninsula Buri and set off by barge to Aden. On the way he landed at Hamfale and visited the Ragad Salt plain to the west, 60 m. below sea-level and also climbed the volcano Oerteale, the first African volcano found to be definitely active. Lack of provisions forced him back to the barge but he stopped in Assab Bay, then made his way to the Bab el Mandeb Straits and landed at Rac-Arâr, finally reaching Aden by camel. He next made two excursions to the Somali coast, one to Berbera and Bulhar and a longer one to Lasgori in the Wer - Singelli - Somâl from whence he visited the Ahl range, rising to 2000m. and with a most interesting flora, now very much degraded. Hildebrandt found many new species there and the area has continued to yield more right to the present day. After this strenuous Somaliland expedition Hildebrandt took a 'holiday trip' to Karachi (Kurratsahi) and up the R. Indus, then to Zanzibar in 1873. From there, partly in

the company of the zoologist Hagenbeck, he visited the Rivers Wami and Kingani in Tanzania then made an excursion to Brava on the southern Somali coast. Hildebrandt returned to Europe in August 1874, partly because he was in poor health, and partly to prepare for his long envisaged journey to Mt. Kenya.

Second Expedition:- He was back in Aden in February 1875 and for a while occupied himself with anthropological studies. From there he visited Mait (Meith) in the region of the Habr - Gehardiyis - Somal and then the Surud [Serrut] Mts. "into the land where incense and myrrh grow (if not gold)" where he discovered many previously unknown plants including the genus in the Convolvulaceae named after him - Hildebrandtia. He found the Habr - Gehardiyis in great confusion since just previously the Egyptians had occupied the towns of Zeila, Tedjorra and Berberah and even taken inland Harrar - the first time the Somali people had had their freedom threatened. For a time they thought Hildebrandt must be an Egyptian spy, "hiding the most bloodthirsty heart under the sheeps-clothing of a plant collector" and it took him some time to convince them of his peaceful intentions and obtain permission to ride into the interior. He gives a good account of the country. "The easterly projecting Horn of Africa, on which the strong current of the Indian Ocean breaks and sends many a ship to its doom at Cape Gardafui and Ras Hafun, the Scylla and Charybdis of East Africa, is a limestone formation. Several ranges of mountains running parallel to the coast rise up to about 2000 m. Their fantastically fissured slopes contrasting brilliantly against the deep blue tropical sky are covered by a vegetation which is radically different from that of the granite of Abyssinia. Plants yielding rubber and resin are particularly richly represented. The ancients used to call Cape Gardafui or even perhaps the whole peninsula-like region 'Promontorium aromatum'". Hildebrandt was particularly interested in resin-yielding plants and settled the identity of several types of myrrh, frankincense, bitter aloe resins, chewing mastics and tanning plants. He also made numerous observations on Somali customs but also had trouble. "I almost had to forfeit my laboriously assembled collection, for, one day several hundred warriors confronted me, demanding the blood and possessions of the hated foreigner. The rattling of our guns cooled them down sufficiently, however, so that after hours of negotiation, I was able to satisfy them with an advance compensatory payment in chewing tobacco for the harm which my visit and witchcraft would evidently bring in their wake". After returning to Aden from whence he sent his Somali collections to Germany, and staying from June until September on Johanna Island in the Comoros gathering yet more interesting plants including 47 new species of mosses, he finally reached Zanzibar again. Here he engaged porters and equipped himself for his journey to Kenya but had a great deal of misfortune. He had hoped to proceed inland from Pangani and indeed was invited to join a 2000 strong caravan of ivory traders who were planning to cross Masailand to Lake Victoria ("Bahari ya pili" - literally second sea) but he turned it down since it was not where he wanted to go - fortunately it turned out, since a year later he heard that few of this caravan had escaped the spears of the wild hordes of Masai. He finally went north to Lamu hoping to proceed inland along the R. Tana through the southern Gala (Galla); this too failed because the Gala had been invaded by the Somalis and were afraid to form a caravan. What is more, the Egyptians had now taken Barava (Brava) and other southern Somali coastal towns and everywhere was in uproar. He visited the site of old ruins at the mouth of the R. Ozi. Prostrated with fever and with ulcers on his legs due to scurvy he went to Mombasa in December 1875 to recover and set about learning languages of the interior and also "made a few natural history excursions carried in a hammock but these of course did not yield very much". Still ill, he twice returned to Zanzibar where finally he was nursed fully back to health in the hospital on the English Service ship 'London'. The physician responsible was not forgotten and is commemorated in the name Indigofera sedgewickiana Vatke & Hildebrandt. More porters were engaged in Zanzibar and in November 1876 they left for Mombasa to make a preliminary training trip to Maweni in Duruma. Here he collected some galena from the so-called antimony mines and makes some terse comments still very much applicable - "Travellers are often reproached with not having paid enough attention to products which might have a technical application. I myself have supplied various important raw materials to business concerns on the spot as well as sending them to

Europe to the appropriate museums, and, I have always received the same answer: 'We will look into the matter' - and that is the last you hear of it"!

On the 10th. January 1877 he set out with about 50 bearers and escort on his long awaited journey into the interior. "We crossed the tremendously fertile coastal hill country of the Wanika (Wanyika) and the Waduruma. Plantation follows plantation - but the cattle had for the most part been stolen a short time previously by the Masai. However, as soon as the terrain sinks down behind these hills, that are made fertile by the moist sea winds, and merges into the boundless plain of the interior the landscape assumes the typical aspect of the real Africa. The garish red or yellow sunbaked soil is covered with the densest thickets of fleshy Euphorbias dripping with poisonous latex, Africa's cacti, and these are intermixed with thorny and spiny plants of a wide range of other plant families, each in its own way putting up resistance with hooks and barbs to the passage of both man and beast. Here and there also a tree forming an umbrella but offering as much shade as would the uncovered framework of a parasol. In these desolate wastes water is only to be found at great intervals. It is collected from previous rain in natural depressions in the rock. It is at these pools of water that the Ariangulo, wild bush-rangers related to the Gala lie in wait for the trade caravans". One now crosses this area at high speed on a tarmac road but anyone who has broken down in a car and needed water, as I have, knows even now exactly how these old travellers felt, although there are no longer wild people waiting to ambush you! He pressed on to Taita and pitched camp for a time at the foot of Mt. Ndara. Some of the witch-doctors looked on him as a powerful colleague owing to a former prophecy of a white man coming from the sea. He agreed to go with them up the mountain to "make medicine" to improve the crops. He managed to get the natives to collect numerous plants and animals for his collections. He told them how they could improve crop-yield by spreading cow-dung on the fields and although they did not believe him they amazingly followed his advice. They journeyed NNW to the Voi River. Hildebrandt climbed Ndi "Taita's other mountain" and this is the type locality of the enigmatic Zingis radiolata (which has never been re-collected). Some doubt has been expressed that this is the Ndi on present-day maps. Hildebrandt says "It rises to about 1400 m. above sea-level and 600 m. above the broad plain" which fits but certainly it does not look promising for Zingis. I have searched for it without any result. "We followed a path cut diagonally across the wilderness by the Wataita for the purposes of warfare and along which they had attacked a Wakamba caravan a short time previously. The far-sounding noise of my guns protected us, however, from a similar fate". The march to Ukamba was usually 11 days and on the second day they reached the R. Tsavo, 30 years later to become famous for its lions* which severely hindered the building of the railway at this point. I myself had an adventure near here in 1978 when collecting plants on a rocky hill and accidentally trod on a male (fortunately) lion. It certainly flashed through my head that it might well have had infamous forebears! Hildebrandt set up a fortified camp on the R. Adi (Athi) - "and wandered through the surrounding area collecting as I went and I also sent people out to bargain for provisions in Kikumbulyu, for we had nothing left except for the few fish from the river. Later we waded across the Adi and travelled in a north-north-westerly direction over the Ndungu Range to Ukamba where we rested for several days in the village of Malemba in order to feed ourselves up again". Still travelling NNW they went via Kipopotue to the R. Tiva thence to Ihanga on the R. Ndeo reaching Kitui on the 12th. March. Here he had some trouble because in 1851 Krapf (the first European to sight the snows of Mt. Kenya) had been in company with a chief who was murdered by robbers and had been blamed for it, being accused of making 'bad magic'. Hildebrandt was thought to be out to ruin the whole country and paid out a good deal from his fast diminishing stock of beads, calico, etc.. The rainy season had just started and he was in an excellent position to collect the many plants which suddenly sprang up. All the birds and animals were also active and he mentions many birds familiar to African travellers. Although Mt. Kenya was only three days march away he unfortunately never reached it. The Wakwafi had suddenly charged into nearby villages, killed the herdsmen, driven the cattle away and set up their nomad camp right on the route to Kikuyuland which was the way Hildebrandt

*Patterson, J.H. 'The man-eaters of Tsavo', London, 1907.

had planned to go. It now transpired that shortly before his arrival in Kitui an Arab caravan of 1500 armed men had been slaughtered to a man and obviously he could not force his way through their country. One of his porters was an Mkwafi so he sent him and two others with gifts to try and reach a friendly agreement but they soon returned having fled at first sight of the Wakwafi, throwing down all the gifts and their food. Moreover, the Wakamba witchdoctors and members of the family of Kiwoi, the chief supposedly killed by the power of Krapf's pocket bible, made a great nuisance of themselves and actually prepared to attack Hildebrandt but when he advanced towards the 4-500 armed men with his camera they fled. Apart from this and his followers' fears of the Wakwafi and Wakamba, the supplies were rapidly diminishing. Very disconsolately he gave up the attempt to reach Mt. Kenya and returned to Taita; his plan to visit Kilimanjaro from there was also thwarted, this time by the Masai, who had no less than seven coastal caravans tied up at Taveta, some of whom had been there four months. He reached Mombasa in August and sailed to Zanzibar to pack his "fairly rich collections". His health was now very bad - not only did he have dysentery but enlargement of the spleen, atrophied liver and incipient dropsy. He was earnestly advised to return to a cooler climate.

Despite his own disappointment in not reaching either of the great mountains, his expedition was in reality very successful from a scientific point of view. His material all arrived in Europe safely and contained very many undescribed species and greatly increased our knowledge of East African natural history.

I am very grateful to my colleague Mr. Brian Stannard and to the MAFF Translation Section for translations of German papers without which little of this could have been compiled. The original translations are preserved in the Biographical Pamphlets in the Library of the Royal Botanic Gardens, Kew.

Most of his molluscan discoveries were listed or described by E. von Martens in a paper read before the Royal Academy of Sciences in Berlin on 4th. April 1878 and published the same year with two excellent plates, the figures being drawn and lithographed by W. A. Meyn. Apart from this, a slug he collected in Somaliland was described by Simroth. These are detailed beneath with modern names added.

Atoxon hildebrandti Simroth, 1889. Somali Republic (N), Mait = same.

Type formerly at Berlin but not found.

Buliminus (Rhachis) Braunsii von Martens 1869 var. Hildebrandti von Martens, 1878.

Kenya, Duruma = Rhachistia hildebrandti (von Martens, 1878). Types in Berlin.

Buliminus (Rhachis) conulinus von Martens, 1878. Kenya, Ukamba, Kitui, and Taita,

Ndi = Edouardia sordidula (von Martens, 1897). Types in Berlin.

(von Martens made rather a mess of naming this species; his name conulinus 1878 a later homonym of Buliminus conulinus von Martens 1869 which is also an Edouardia so in 1895 he replaced it with Buliminus (Conulinus) hildebrandti, but since he had used that at varietal rank in 1878 for another Buliminus (see above), he renamed it again as Buliminus sordidulus in 1897).

Cyclostoma anceps von Martens, 1878. Kenya, Taita = Tropidophora (Ligatella) anceps (von Martens, 1878). Type in Berlin.

Cyclophorus ? Hildebrandti von Martens, 1878. Kenya, Ukamba = Maizania hildebrandti (von Martens, 1878). Type in Berlin.

Ennea denticulata Morelet, 1872 var. hildebrandti Jickeli, 1874. ?NE Ethiopia. = Ptychotrema denticulatum (Morelet, 1872) var. hildebrandti (Jickeli, 1874). Type in Berlin.

Lanistes ciliatus von Martens, 1878. Kenya, Finboni = same. Type in Berlin.

Paludomus africana von Martens, 1878. Kenya, Finboni = Cleopatra africana (von Martens, 1878). Types at Berlin.

Paludomus exarata von Martens, 1878. Kenya, Finboni = Cleopatra exarata (von Martens, 1878). Types at Berlin.

Ptychotrema (Ennea) massauense Thiele, 1933. Eritrea, Massawa = same. Type in Berlin.

Stenogyra (Opeas) sinulabris von Martens, 1878. Kenya, Ukamba, Kipopotuë = Curvella sinulabris (von Martens, 1878). Types in Berlin.

Streptaxis enneoides von Martens, 1878. Kenya, Ukamba = Gonaxis enneoides (von Martens, 1878). Type in Berlin.

Zingis radiolata von Martens, 1878. Kenya, Taita, Ndi = same but a problem species, only once re-collected and described as Peltatus polystephes Tomlin; the generic position of a whole series of African snails depends on the dissection of topotypes (see Verdcourt, 1960, 1961). Types in Berlin.

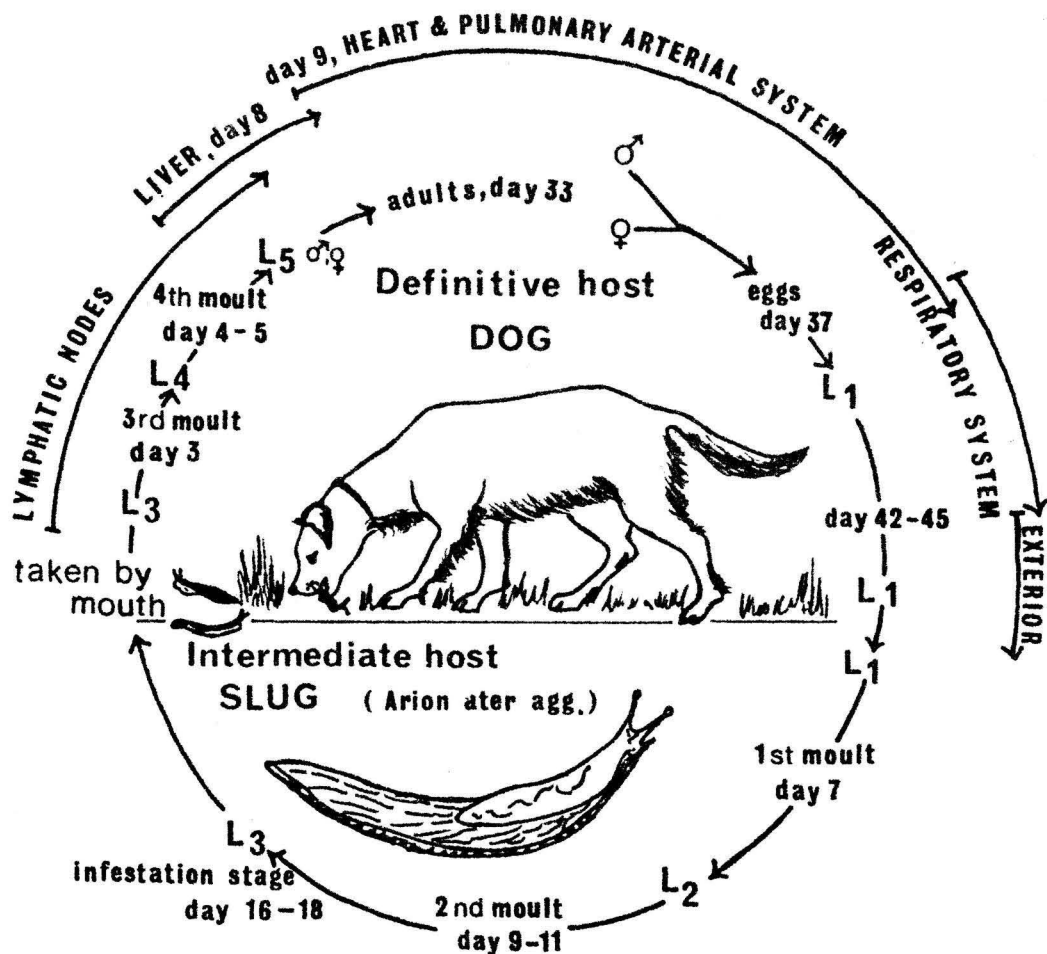
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B. Verdcourt

SLUGS AS INTERMEDIATE HOSTS OF A DANGEROUS PARASITE OF DOGS

The nematode worm Angiostrongylus vasorum (Baillet) causes serious heart and lung conditions of dogs, and in 1979 the first British case was recorded, in Cornwall. The worm was isolated during a post-mortem by scientists at the MAFF Veterinary Investigation Centre, Truro (Jones et al., 1980), and since then there have been a few more outbreaks. The intermediate hosts are known to be slugs, and after examining a number of species, larvae of A. vasorum were recovered from a large slug taken in the garden of affected kennels (Simpson & Neal, 1982): however, the technique for recovering the worms, involves digestion of the slug and the enzyme used (pepsin) left no identifiable remains. It was at this point, early in 1982, that I was contacted and asked to identify slugs before these were digested.



- Life cycle of *Angiostrongylus vasorum* -

(after Guilhon & Cens 1975)

It seemed probable that the intermediate host would be a scavenger, and therefore that *Arion ater* L. and/or *A. lusitanicus* complexes would be involved as they commonly eat excreta, including that of dogs, and would void larvae in positions where dogs would be likely to pick them up from vegetation or garbage: indeed some dogs are known to eat slugs. Now a wide range of slugs and even snails has been examined, and as yet there have been positive results only from *Arion ater* agg. Miss S. M. Davies has recently examined further Cornish slugs of this complex, and finds them to be a southern form, but not *rufus*. The geographical range of these 'species' may have more than an academic interest in relation to this canine disease which has, it seems, a very restricted distribution - Ireland (where it is endemic in greyhounds), France, Italy and now Cornwall. Detailed research by Guilhon & Cens (1973) reveals that, in France, the only species found to harbour this nematode under natural conditions is *Arion 'rufus'* but no less than 11 of the 17 species that were tested, were receptive to infestation, and bred the nematode larvae to stage 3: these receptive species were *Arion lusitanicus*, *A. hortensis* Férussac, *Deroceras reticulatum* (Müller), *Limax flavus* L., *Helix pomatia* L., *Cepaea nemoralis* (L.), *Arianta arbustorum* (L.), *Theba pisana* (Müller), *Succinea putris* (L.) and *Cochlodina laminata* (Montagu), as well as two freshwater species of tropical origin, *Physa* sp. and *Biomphalaria glabrata* (Say). The two French workers conclude that the reason that none of these species appear to harbour *Angiostrongylus* under natural conditions, is due to their life style, which does

not bring them in to close contact with dogs. However, as the late Mr. A.E. Ellis observed, Arion lusitanicus is notorious for scavenging on canine faeces, at least in this country, so it will be surprising if it is not found to carry this parasite in the wild.

Guilhon, J. & Cens, B., 1973.

1866). Etude biologique et morphologique. Angiostrongylus vasorum (Baillet, Ann. Parasit. humaine comp. 48: 567-596.

Jones, G.W., Neal, C. & Turner, G.R.J., 1980

Angiostrongylus vasorum infection in

dogs in Cornwall. Vet. Record 106: 3.

Simpson, V.R. & Neal, C., 1982.

Angiostrongylus vasorum infection in

dogs and slugs. Vet. Record 111: 303-304.

I am grateful to Mrs. Trish Burton for drawing the figure.

Stella M. Turk

EIGHTH INTERNATIONAL MALACOLOGICAL CONGRESS, BUDAPEST, 1983

The Eighth International Malacological Congress was held in Budapest, Hungary from 28 August - 4 September 1983 and was a well attended meeting with 186 delegates representing 34 countries. As usual the Congress programme included field excursions, a reception, Congress dinner and a meeting of the European Invertebrate Survey as well as the lectures and poster sessions. Dr. L. Pinter of the Hungarian Natural History Museum was President and he was ably assisted by a local organising committee.

The scientific part of the meeting was divided into separate symposia - Quaternary studies; Sphaeriidae; Applied malacology; Biogeography; Physiology, endocrinology, reproduction, genetics, etc.; Taxonomy and Ecology. Hungary is a land-locked country without its own coastline and the meeting therefore had a strong bias towards land and freshwater molluscs and comparatively few marine papers. All contributions given at the Congress are being prepared for publication.

Three days were given to excursions which lasted all day and included a lunch of Hungarian food and wine, which was much enjoyed. The first excursion was to the Danube Bend and small towns of Esztergom and Szentendre. The weather was dry and hot and snails not easy to find, but numbers of Helicella obvia (similar to our Helicella itala) were to be seen attached to dry plant heads around the cathedral hill at Esztergom. On the shore of the Danube at Szentendre were masses of dead shells and some live animals on stones. These included some species new to British malacologists and the list consisted of: Fagotia acicularis, F. esperi, Valvata piscinalis, Bithynia tentaculata, Theodoxus danubialis, Viviparus acerosus, Lithoglyphus naticoides, Lymnaea peregra, L. truncatula, Planorbis planorbis, Dreissena polymorpha, Sphaerium rivicola and some species of Unio and Anodonta.

The second excursion gave a choice of three places, one tourist visit to Lake Balaton (the Hungarians' nearest equivalent to the seaside), a second to the north-west of Budapest looking at fossil localities and a third (which I went on) to the Hungarian plains, a flat sandy area south-east of Budapest. Our first stop was the National Park Centre at Kecskemet where we were welcomed by the Warden and given a most interesting talk (in English) on the National Park system in Hungary and the measures being taken to protect wildlife. As in Britain four species of snail were given special protection. The Warden went on to outline the problems of conserving an area of largely man-made landscape which is heavily cultivated. The park itself is divided up and consists of different patches around the town of Kecskemet, the individual reserves being selected as good examples of the main ecosystems, which here included lakes and gallery forest, plains, sand dunes and swampy areas including wet woodland. The term "puszta" is applied to wilderness areas and means

"empty place". In the grounds of the National Park Centre we started collecting and saw live examples of Helix pomatia, Cepaea vindobonensis, Monacha cartusiana, Helicella obvia and shells of Chondrula tridens.

The first field visit was to the Bugac puszta where we saw the great cattle and horses of the plains and then went on to look at molluscs in a marshy area and on sand hills. The wetland yielded Viviparus acerosus, Bithynia tentaculata, Planorbarius corneus, Planorbis planorbis, Anisus vortex, Lymnaea stagnalis and Succinea oblonga. Woodland with juniper on the nearby sandy hills provided an interesting range of snails in which the pupiform types were well represented. Cepaea vindobonensis (shell rather like our Cepaea but larger and with marked axial striations), Helicopsis striata (a sub-globular "Helicella" type with striations and deep sutures), Granaria frumentum (elongate shell with many teeth going back into the mouth) and Chondrula tridens (pupoid type with three conspicuous teeth) were all abundant on the sand hills.

After a splendid barbecue lunch we visited another area of reserve along the Tisza river. Here deciduous woodland yielded Perforatella rubiginosa (very small umbilicus), Zonitoides nitidus, Succinea elegans, Cochlicopa lubrica, Euconulus sp. and Carychium sp. A wetland area by the river Tisza proved most prolific in freshwater snails with enormous shells of Planorbarius corneus. The list here included Bithynia tentaculata, Lymnaea stagnalis, L. palustris agg. (a large form referred to as L. corvus), Planorbarius corneus, Planorbis planorbis, Anisus vorticulus and Segmentina nitida (which is quite well distributed in Hungary). Black storks and Moor Frogs (Rana arvalis) were also seen by the Tisza.

The final day of the Congress was to the National Park at Bukk in the mountains north-east of Budapest. Unfortunately this was a really wet day, and those of us wearing spectacles were rather incapacitated. We did however walk through the woodland reserve and I found Bradybaena fruticum and Lacinaria plicata at this site. The last venue of the day was a wine cellar (near the home of the famous Bulls Blood) and on our way in, large numbers of Helix pomatia were seen crawling alongside the path, obviously enjoying the wet weather.

The 1983 meeting in Budapest was a most enjoyable Congress and our thanks are due to Dr. Pinter and the organizing committee for their work in preparation. One particular feature of the meeting was the attendance of many malacologists from eastern block countries, and it is hoped that another Congress in the future will again meet in the east. Contact between normally isolated groups of malacologists was valuable scientifically, particularly in the fields of biogeography and systematics. At the concluding session the venue of the next Congress was announced as Edinburgh in 1986 with David Heppell of the Royal Scottish Museum as President and organizer.

June Chatfield

LITERATURE ON HUNGARIAN MOLLUSCS RECENT AND FOSSIL

Members of the International Malacological Congress in Budapest 1983 all received a bibliography to publications on molluscs in Hungary, recent and fossil entitled "Magyarországi Pleisztocen és Recens Malakológiai Bibliográfia" by Dr. Merenyi László - Budapest 1983. This lists some 1216 publications arranged alphabetically by author and at the back there is also a cross index to subjects, but not to species. Most of these references are in German or Hungarian but there are a few English titles. Members of the Conchological Society might like to note the following three on Hungarian molluscs by Dr. Hildegard Zeissler.

1969 Collecting snails in Hungary. The Danube and southern Hungary, and its banks. Conchologists' Newsletter 31, 119-120

1970 Collecting snails in Hungary. A three days' trip to the Bukk Mountains. Conchologists' Newsletter 35, 177-181.

1971 Collecting snails in Hungary III Dr. Krolopp shows famous sites of calcareous tufa containing remarkable molluscs. Conchologists' Newsletter 39, 230-233.

It is possible that some of these back-numbers of the Newsletter may still be available.

June Chatfield

HELICOSTYLA

The coasts of the Phillipine Islands with their coral reefs produce such a wide variety of remarkable and beautiful seashells that it is sometimes forgotten that the land shells also, of this group, are matchless anywhere for their beauty and variety. Of these, Rhysota spp. reach six inches across and the smaller groups such as Chlorea come about 2", in five species. About fourteen species of Hemiplecta are generally restricted to Luzon and the Visayan area and the ten known of Camaena are restricted to Palawan and Mindoro. The islands are strong in operculates, fifteen species of Cyclophorus being scattered throughout the archipelago. Other groups include Rhysota (15 spp.), Obba (11 spp.), Pila, Hemitrichia, Ganesella, Trochomorpha, Macrochlamys, Leptopoma, Amphidromus, Geophorus, Potamides, Melanoides and many other Thiaridae, besides Neritinae, Pupillidae, Streptaxidae, Viviparidae, Unionidae and a number of others. The present note looks briefly at the Helicid family Helicostyla, perhaps the largest and most striking group of all.

When these shells were first discovered they were grouped under the then very 'portmanteau' name of Helix and indeed the anatomy shows that they are fairly closely allied to that group. However, a distinction was evidently necessary and in 1819 Ferussac named the group Cochlostyla regarding it as a genus with numerous subgenera.

Owing to the impenetrability of the Phillipine forests, new species continued to be discovered for many years and it may be that one or two are still not known to science. Cuming's third voyage 1836-50 was almost entirely devoted to the Phillipine Islands and he reported in a letter to Ruppell, 20 October 1839 that he had collected "3045 species and varieties of shells of which the Terrestrial and Fluviatinal amount to 550 species and varieties" (Dance, 1980).

The first comprehensive review of the group was carried out by Henry Pilsbry in his continuation of Tryon's Manual of Conchology (Vol. VII, Helicidae Vol. V) in which he continued to use the name Cochlostyla like most of those before him; he later produced convincing evidence for the use of Helicostyla (Fer. 1819; Mörch, 1867) in preference. The group is now regarded as belonging to the Bradybaenidae (Beck, 1837).

The snails are all forest lovers and a large proportion of them are arboreal; it is said that some species cannot be collected at all except in the season of storms, which reaches its peak during the June-September period. A succession of twenty-odd typhoons bring torrential rains and high winds to the islands and many snails can be found on the ground under the tall tree cover. Other snails live in smaller trees, in bamboo thickets, in small bushes, plants and underbrush. Some snails which were once plentiful seem to have become scarce or probably extinct: the population of the islands is increasing and large areas of forest have disappeared in recent years. The slash-and-burn principle of agriculture is now illegal but is probably still largely practised in the remoter areas, where most of the snails live.

Identification presents problems since some examples are variable and the distinction between species is sometimes a matter of opinion. Also the group as a whole tends to merge towards adjacent groups and there are still differences of opinion whether, for instance, Phoenicobius should be regarded as coming within the heading of Helicostyla or as a member of the Camaenidae. Pilsbry included groups of snails from Papua and elsewhere with Helicostyla but these are now separated and the Phillipines are regarded as almost the sole area for the remainder. Dated sources ascribe about 300 species to the Islands, a total of some 160 species occurring in the southern area, Luzon, including the islands of Mindoro and Marinduque. The Visayan group of islands, between Luzon and Mindanao, are said to produce about 75 species, Palawan and its adjacent islands about 35, while Mindanao and Sulu are represented by about 15. These figures are no doubt understated.

Helicostyla is extremely diverse in shell form, varying from depressed, helicoid to elongated and buliform, usually imperforate; rounded at the circumference or keeled; the lip generally reflexed but occasionally simple; usually covered with a thin transparent cuticle, often porous in places, when it becomes white and opaque, producing the hydrophanous patterns with which most of the species are ornamented. This diversity of form and pattern is in contrast to the anatomy which varies hardly at all and the shells undoubtedly form a natural group. Extreme forms are so closely connected that no satisfactory subgenera can be defined, but the system of 'sections' or groups was sketched out by von Martens (Ostas. Zool. p. 96) and improved by Semper (Phil. Archip. Land. Moll.). Basically the arrangement is as follows: the listing is mainly in accordance with Pilsbry (Man. Conch. VII and VIII) but as that work is rare, it may be of use to include it here in abbreviated form.

Section 1. CHLOREA Albers, 1850

"Imperforate, varying from depressed globose to lens-shaped, generally solid; whorls 4 - 5, the last descending or not; lip decidedly reflexed, at least below. Entire surface showing under a lens excessively fine, close spiral lines; lacking hydrophanous patches on the cuticle."

Section 2. CORASIA Albers, 1850

"Imperforate (rarely perforate), depressed-globose, often carinated; thin, subdiaphanous; whorls $3\frac{1}{2}$ - 5, rapidly widening, the last scarcely descending; lip slightly expanded or narrowly reflexed. Surface more or less striated spirally, lacking opaque or 'hydrophanous' markings."

Here may be grouped all of the species of Helicostyla ranging outside of the Phillipine Islands; some of them are found in the Moluccas, the Solomon Islands and New Guinea.

Section 3. PFEIFFERIA Gray, 1853

"Shell globose, imperforate, the slender axis solid, thin, brittle, white with few whorls; aperture lunar, lip thin, acute, fragile; columella slightly thickened, vertical, deeply inserted in the base."

One species only here.

Section 4. LEYTIA Pilsbry, 1891

"Imperforate, globose, thin; whorls few (4), the last angulated at the periphery. Aperture very large, lip simple, a little expanded below; columella simple, thin, vertical, deeply inserted. Surface spirally striated, having hydrophanous, cream-white bands."

One species only.

Section 5. CALOCOCHLEA Hartmann, 1840

"Imperforate, solid shells, varying from globose to depressed-globose or lens-shaped and carinated. Generally covered with hydrophanous cuticle, variously

patterned."

Under CALOCOCHLEA must be placed the following two subsections which stand too close to one another to be separated as primary divisions of Helicostyla although they have a certain systematic value.

AXINA. "Imperforate shells, varying from globose-turbinate to flattened carinated and lens-shaped; solid, dark-coloured; more or less covered with a hydrophanous cuticle; the surface smooth or at least totally lacking spiral sculpture; whorls $4\frac{1}{2}$ - 6; lip either narrow or broadly reflexed."

TRACHYSTYLA. "The shell is solid, dark coloured, with a dull ashen hydrophanous cuticle. The spire is short, whorls few and rapidly widening, columella oblique, straight; surface dull and roughened."

Section 6. CHROMATOSPHERA Pilsbry, 1891

"The shell is imperforate, heliciform, depressed-globose, solid and opaque, richly colored, but lacking spiral sculpture; last whorl scarcely descending at the aperture. Lip blunt, usually very narrowly reflexed throughout; columella subvertical, deeply inserted, the umbilico-columellar area covered with a concave white callus."

A small group of rare shells confined to Northern Luzon.

Section 7. HELICOSTYLA Ferussac, 1819 (s.s.)

"Globose, globose-conic or oblong; colors not vivid; hydrophanous cuticle sometimes present."

These shells are similar to Calocochlea but with a generally more elevated contour; a number of subsections occur here also.

PACHYSPHERA Pilsbry, 1891: "Small, globular or globose-elevated, solid, brightly colored; lacking hydrophanous cuticle and spiral striae."

ORUSTIA Mörch, 1852: "Turbinate-globose, thin, brightly colored; partly covered with a hydrophanous cuticle; no spiral striae. Lip narrowly reflexed, thin; columella vertical, not folded, deeply entering."

COCHLODRYAS Martens, 1860: "Globose-elevated; colors brilliant green or brown; no hydrophanous cuticle; suture white margined; surface shining, having faint spiral striae above."

Section 8. PTYCHOSTYLUS Möllendorff, 1888

"Shell globose-turbinate, formed of many closely coiled whorls, the surface having hydrophanous cuticle; aperture narrowly lunar; columella spirally twisted, having a strong tooth-like fold at the base."

This group contains only a single species.

Section 9. HELICOBULINUS Broderip, 1840

"Shell capacious, turbinate-globose, solid, variegated with green or brown, covered with a variously patterned hydrophanous cuticle. Columella more or less folded."

Section 10. COCHLOSTYLA Ferussac, 1819 s.s. (= Orthostylus Beck, 1837)

"The shell is generally large, solid ovate-conic, covered with a variously patterned hydrophanous cuticle. Aperture oblique, ovate; lip reflexed; columella nearly vertical, more or less obviously folded below."

The limits of this section are not easy to discern and it tends to merge into section 9.

Section 11. HYPSELOSTYLA Martens, 1868

"The shell is imperforate, narrow and elongated, usually rather thin and somewhat carinated at the periphery; peristome more or less expanded but not broad; no umbilical fissure."

Section 12. OPALLIOSTYLA Pilsbry, 1896 (= Eudoxus Albers, 1850)

"The shell is ovate or ovate-conic, imperforate, smooth, shining, very light colored, generally thin and destitute of hydrophanous cuticle. Columella rather narrow, its face flattened."

Section 13. PHENGUS Albers, 1850

"Thin-shelled, pale green species, distinctly trochoidal in contour, having no hydrophanous cuticle."

Two species here.

Section 14. CANSITRUM Mörch, 1852

"Ovate conic or oblong shells, imperforate and solid; banded; with or without hydrophanous cuticle; surface microscopically striated spirally. Whorls narrow. Lip well expanded, columella vertical."

Three species.

Section 15. DOLICHOSTYLA Pilsbry, 1896 (= Prochilus Albers, 1860)

"Shell narrowly perforated, ovate pyramidal smooth and shining; the spire long. Aperture small, less than half the length of the shell; peristome very broadly reflexed."

Affinities with Chrysallis.

Section 16. CHRYSALLIS Albers, 1850

"Shell perforated, elongated ovate-conic, solid, opaque, not smooth; the aperture ovate, less than half the length of the shell; lip broadly expanded; columellar margin dilated and reflexed. Hydrophanous cuticle generally present."

Three species.

Many of the above definitions strike one as somewhat vague on first impression but after one becomes a little acquainted with the family they seem usually enough to allot the shells to their respective sections.

T. E. Crowley

DO BIRDS EAT HELIX POMATIA?

Has anyone found fragments of Helix pomatia shells at a thrush-stone, or seen any birds attacking these snails? For many years I had a colony of H. pomatia in my garden (in the Wirral peninsula, Cheshire) but never found any victims of attack, nor saw a bird molest them. Even in the long drought of 1976 when specimens of H. aspersa were smashed by the hundred, my pomatia walked about among foraging blackbirds, etc., unharmed.

Edward Step, however, in a little book Nature Rambles an Introduction to Country Lore Summer to Autumn (Warne's, 1930) on p. 111 describes how he found fragments of the Roman Snail "sticky with slime" on a Downland flint and goes on "some of our larger birds have been feasting on the snails. I suspect the Magpie. Numbers of broken shells are about, from which the snails have been taken and eaten".

Can any reader living in pomatia country confirm or deny Step's statement?

Nora F. McMillan
Merseyside County Museums, Liverpool, 9 October 1983.

POMATIAS ELEGANS IN CAMBRIDGESHIRE

'Introductions' are usually to be deplored but at least they ought to be published. This remark has been provoked by finding a letter from a Mr. L.F. Buckle of Little Shelford, Cambridgeshire (I hope he will forgive me for quoting from his letter!) among much archival material of the late Dr. J. Wilfrid Jackson. The letter in question is dated 1st. August 1946 and gives details of the writer's attempts to re-find Clausilia biplicata at Purfleet, Ena montana in Birdlip Hill woods, Valvata macrostoma at Upware, etc..

He goes on to say that there are plenty of Helix pomatia on Maggot's Mount, Little Shelford district, and adds that in August 1945 he planted Pomatias elegans on the same hill. He continues "though the 'dead' colony did not show up until undergrowth was cleared on the N. side this spring. I had searched there since 1938. A 'dead' colony of this species is on Orwell Hill, NW of Wimpole, Cambs. mostly exposed by rabbits' efforts".

Nora F. McMillan, Merseyside County Museums, Liverpool

PERFORATELLA RUBIGINOSA (SCHMIDT) AND CLAUSILIA DUBIA DRAP. IN KENT

On reading the account by Dr. Verdcourt of the occurrence of Perforatella rubiginosa at Syon Park in the December 1982 issue of the Newsletter I was interested in his description of the habitat as this would fit exactly some areas along the banks of the River Medway in Kent. On my next trip out on 8 January I visited one such site just a few hundred metres from my home at Aylesford (TQ[51] 730589) and under almost the first piece of driftwood that I lifted were two specimens that fitted the description of this species. I must thank Dr. D.T. Holyoak who later confirmed the identification by dissection.

In J. Conch. 13 (1912): 276, H. Overton reported having taken Clausilia dubia on one of the walls at Dover Castle in 1897. Recently Dr. M. Kerney has informed me (in litt.) that he has seen specimens of this species labelled 'Dover' in the MacAndrew collection in the University Museum of Zoology, Cambridge, a collection dating from before 1873. As this is the only certain recorded locality in southern England Dr. Kerney suggested that I should look to see if this species was still present. A chance to visit Dover Castle came on 11 May this year (1983) and within ten minutes the first specimen had been found. Further searching proved that Clausilia dubia was quite frequent in this locality and was found on the stone walls, particularly in the cracks between the stones, under ivy that climbed up some of the walls, and among the roots of vegetation that topped many of the low walls. It occurred on walls facing in all directions at several places all round the castle and was in company with Clausilia bidentata (very common), Lauria cylindracea and Helix aspersa.

Hoping that my luck would continue I spent a day in the Luddesdown area in September in the hope of re-finding Cernuella neglecta. The area, however, is now one of great cornfields with very few hedgerows remaining, and although all these were carefully searched there was no sign of neglecta and it looks truly as though this species is now lost to the British List.

Eric G. Philp

AN OLD RECORD OF LEIOSTYLA ANGLICA (WOOD) FROM KENT

Leiostylia anglica is a land snail that occurs in damp hollows within woodland and in marshes, particularly in northern and western Britain. It is exceedingly rare in south-east England today although fossil records demonstrate that it was widespread over the whole of Britain between about 8000 and 5000 BP (Phil. Trans. R.Soc.Lond.B 291, pp. 1-43). Its occasional occurrences living in southern Britain (e.g. at Balcombe, Sussex) are presumably relict colonies from that time.

A specimen of L. anglica in Perth Museum, collected by Miss E.R. Fairbrass from Faversham, Kent in 1878, is therefore noteworthy. The specimen (registration number 1979 1 368) is correctly identified and was obviously collected live. The record was even included in Henry Coates's Catalogue of the Conchological Collections in the Perthshire Natural History Museum (1925, p. 59) although overlooked by the Census. No further details are available on the exact site at Faversham but there seems no reason to doubt the authenticity of the record, especially since Miss E.R. Fairbrass is known to have lived in Abbey Street, Faversham. She was a member of the Conchological Society from 1885 to 1891.

R. C. Preece

Subdepartment of Quaternary Research, Godwin Laboratory, Cambridge, CB2 3RS

FIELD MEETING TO FLITWICK MOOR, BEDFORDSHIRE, 1st. OCTOBER 1983

A small party of 7, including Dr. Kerney, endured a persistent drizzle but managed to beat all previous species lists recorded on any one expedition to the locality, with 52 species found, and also succeeded in adding 7 species to the total list known from the moor.

Vertigo antivertigo was re-found in some numbers but V. substriata eluded us. Its exact known habitat was destroyed by overfilling with earth some years ago but it seems most unlikely that it does not still occur somewhere in the area. The species added to the list (see Conchologists' Newsletter 81: 6-8 [1982]) are Bithynia leachii, Ancylus fluviatilis (also new to the 10 km. square), Acroloxus lacustris, Sphaerium lacustre, Ena obscura, Arion circumscriptus and Limax maximus thus bringing the total list to an amazing 73 species for an unpromising area and a surprising percentage of the 89 known from the 10 km. square concerned. Ashfordia granulata occurs in amazing abundance yet it was not recorded during earlier visits prior to 1969 or, unforgivably, perhaps confused with Trichia. Of 6 Pisidium recorded for the area, only P. amnicum was not re-found; P. casertanum, P. milium, P. subtruncatum and P. nitidum were found in the R. Flit and P. personatum and P. milium in the marsh and its ditches. An error has crept into the 1982 note - despite my mention of "not a single Vertigo was found" a presence symbol occurs against V. antivertigo in the 1981 column and needs expunging. A complete list of species found during the day is of course available.

B. Verdcourt

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 968th. (Ordinary) Meeting held on 21st. May 1983 at B.M. (N.H.)

In the Chair: Mr. T. Pain, with 33 members and friends present

Nominations and Elections: 3 full members

1. Devall, Miss C., [REDACTED], Hartshill, Stoke-on-Trent,

2. Harrison, S., [REDACTED], Kew, Surrey.
3. Reid, Dr. J.C., Dept. Bio. Sci., Univ. of Calabar, Calabar, Nigeria.

Lecture: 'Marine Mollusca and Nature Conservation' by Mr. Roger Mitchell

Papers read: 'Perforatella: the helicid snail recently recorded in Britain' by F. Naggs

Announcements and Correspondence:

1. It was announced that there would be a field meeting to Dawlish and Exmouth on 8th.-10th. July led by Miss Janet Sawyer. Details could be obtained from Miss Sawyer.
2. Mrs. Fogan announced that the Ulster Museum Catalogue would probably be published in September or October 1983 with a price of £9 or £10 (twice the original price). A notice to this effect will be inserted in the Newsletter. Any complaints should be addressed to Mrs. Ross, not Mrs. Fogan.
3. Two tickets for the Chelsea Flower Show were auctioned for the benefit of the Society's funds.

The meeting was closed at 5.05 p.m.

Exhibits

T. Pain	Species of Buccinidae, mostly from deep water, recently added to the British Marine List
J. D. Nunn	Assorted information of interest to members of the Society
E. Sándor	Family Pectinidae, Rafinesque 1815
J. Llewellyn Jones	Recent Cephalopoda
A. P. H. Oliver	Turritellidae and S. African Haliotidae
W. Karo	Cymatium ranzanii (Ranzani's Triton) Bianconi 1851, Masinials. Oman
C. P. Palmer	Life attitudes of some fossil bivalves
J. K. Lee	The Nautilus and the gang of Three

The 969th. (Ordinary) Meeting held on 15th. October 1983 at B.M. (N.H.)

In the Chair: Mr. A. Norris with 44 members and friends present

Nominations and Elections: 10 full members and 3 junior members

Full members

1. Birch, G., [REDACTED], Leek, Staffordshire, [REDACTED]
2. Brown, B.W., [REDACTED], Stratford-upon-Avon, Warwickshire, [REDACTED]
3. Davis, Ms. R., c/o. Keats House Museum, Wentworth Place, Keats Grove, Hampstead, London, NW3 2RR
4. Hall, R., [REDACTED], Blackpool, Lancashire, [REDACTED]
5. Kennaway, J., [REDACTED], Cuckfield, West Sussex
6. Keukelaar, T.P., [REDACTED], 4475AP Wilhelminadorf, Nederland
7. Orpwood, J.R., B.Sc., [REDACTED], Croydon, Surrey, [REDACTED]
8. Purden, Miss L.M., D.S.R.R., S.R.R., [REDACTED], Wetmore Lane, Burton-on-Trent, [REDACTED]
9. Smith, L., [REDACTED], Blythe Bridge, Stoke-on-Trent, Staffordshire, [REDACTED]
10. Wilson, J.N., Transworld Petroleum, 10 St. James Street, London, S.W.1.

Junior members

1. Brown, Miss M., address - see above No. 2
2. Draisey, Miss J., [REDACTED], Ruthin, Clwyd, N. Wales
3. Bevan, Miss L., [REDACTED], West End, Woking, Surrey, [REDACTED]

Announcement: Mr. Norris announced that copies of some of the Linnaean Society Synopses were available at the meeting and free for members to take away.

Lecture: 'Limpets' by Mr. Roger Burrows

Papers read: 1. 'Ontogenetic change of shell colour patterns in Littorina neglecta Bean (1844)' by C.J. Hannaford Ellis

2. 'Septibranches abyssaux de l'océan Indien occidental' by J.-M. Pontiers

3. 'Land snails from Southern Lebanon' by J. Heller

Announcements and Correspondence: The secretary announced that she had received two letters from collectors abroad who wished to exchange shells with members of the Society. Their addresses were available to interested members.

Mr. Norris announced that there would be further copies available of the Linnaean Society Synopses to interested members.

The meeting was closed at 4.50 p.m.

Exhibits

E. Sándor	Family Strombidae Rafinesque, 1815 Genus Strombus Linnaeus, 1758
A. P. H. Oliver	Some Patellidae, and rarities from Oman
W. Karo	<u>Conus thailandis</u> da Motta 1978, from Phuket, Thailand
R. P. Scase	Colour polymorphism in <u>Littorina scabra</u> and Illustrations of World-Wide Patellidae (from 'Indo-Pacific Mollusca')
A. Seccombe	Shells from Mauritius
D. R. Worth	Shells from Guernsey and Herm
B. Colville	Some fresh-water limpets
R. Burrows	Limpets from Cornwall
J. D. Nunn	Assorted information of interest to members

The 970th. (Ordinary) Meeting held on 19th. November 1983 at B.M. (N.H.)

In the Chair: Mr. A. Norris with 36 members and friends present

Nominations and Elections: 6 full members, 1 junior member and 1 family member

Full members

1. Ball, Mrs. K., [REDACTED], London, N6 4AF
2. Chater, A.O., Botany Dept., British Museum (Natural History), Cromwell Road, London, SW7 5BD
3. Heritage, Mrs. E.A., [REDACTED], Twyford, Reading, Berks., [REDACTED]
4. Lange, Ms. K.M., [REDACTED], London, [REDACTED]
5. Rockingham, Lieutenant Commander H.W., [REDACTED], Corscombe, Dorchester, Dorset, [REDACTED]
6. Strack, H.L., [REDACTED], 3036LL Rotterdam, The Netherlands

Junior member

Kettle, Jonathan, [REDACTED], Radley, Abingdon, Oxon, [REDACTED]

Family membership

Sussman, D.L., [REDACTED], St. Johns Wood, London, [REDACTED]
Sussman, S.A., (Ms)

Announcements: Mr. Norris announced that a card was being sent to Mr. Pettitt, a member of the Society, whose wife was seriously ill.

Nominations for Council Membership for 1984 were to be sent to the Secretary by December 31st. 1983. A minimum of five nominations were required this year.

Mr. Norris announced that Mr. Negus has requested more material for the Newsletter, from both old and new writers!

Lecture: 'Onchidella' by Mr. Trevor Tween

Announcements and Correspondence: several books were auctioned for the benefit of the Society's funds

The meeting closed at 5.05 p.m.

Exhibits

W. Karo	<u>Conus thomae</u> , Gmelin 1791 - Bohol, Phil. Is. <u>Conus dusaveli</u> , H. Adams 1872, Phil. Is. Bohol
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E. Sándor	Conus circumciscus, Born 1778 - Bohol, Phil. Is. Conus taeniatus, Hwass 1792, Gulf of Oman Family Strombidae Rafinesque, 1815 Genus Tibia Roding, 1798 Genus Terebellum Roding, 1798 Family Muricidae da Costa, 1776 Genus Homalocantha Mörch, 1852 Genus Typhis Montfort, 1810
A. P. H. Oliver	The Genera Rhinoclavis and Pseudovartagus of the Cerithidae
T. Pain	Is this the most ponderous land shell? <u>Placostylus senilis</u> (Gassies 1869) Isle of Pines, New Caledonia (sub-fossil)
C. J. Chibnall	Worldwide Opisthobranchs
J. Llewellyn Jones	Worldwide Pectinidae
D. B. Worth	Helix aspersa
J. S. Llewellyn Jones	Some British shelled opisthobranchs and photographs by Thompson and Brown of British Nudibranchs
T. E. Thompson & A. Zenetos	Primitive opisthobranchs
T. C. Tween	Onchidella celtica, live specimens, photographs and a selection of literature
J. D. Nunn	Assorted information of interest to members

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

c/o. British Museum (Natural History), Cromwell Road, London, SW7 5BD

ITZN 11/4 A.N.(S.) 127

21 October 1983

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the Bulletin of Zoological Nomenclature, volume 40, part 3, on 21 October 1983 and would welcome comments and advice on them from interested zoologists.

Correspondence should be addressed to the Secretary at the above address, if possible within six months of the date of publication of this notice.

Case No.

- 2420 Neadmete Habe, 1961 (Gastropoda): proposed designation of a type species under the plenary powers.
- 1049 Panopea Ménard de la Groye, April 1807 (Mollusca, Bivalvia): proposed conservation and related problems.
- 2152 Donax hanleyanus Philippi, 1847, proposed conservation and proposed suppression of Donax hilairea Guérin, 1832 (Mollusca, Bivalvia).

Volume 40, part 4, on 30 December 1983

- 2432 Glossodoris Ehrenberg, 1831, Hypselodoris Stimpson, 1855 and Chromodoris Alder & Hancock, 1855 (Gastropoda, Opisthobranchia): proposed clarification and conservation.
- 2151 Rhinoclama Dall & Smith, 1886 (Mollusca, Septibranchia): proposed validation of the customary usage.
- 1987 NASSARIIDAE Iredale, 1916 (Gastropoda): revised proposals for conservation.

R. V. Melville, Secretary

THE NEW GAMESMANSHIP

(A reply to Phil' Palmer's piece in Conchologists' Newsletter of December 1983: 119)

It's ever such good fun to have your very erudite paper published in some Journal which no-one else ever sees, then criticise everyone for not being up-to-

date. Definitely one-up, and very wittily exemplified by Phil' Palmer in On Referring to Scaphopods. He must surely have been one of Stephen Potter's star pupils. The Veliger -in which he "appeared"- is hardly on the circulation list at the local public library, and I suspect that few Conch. Soc. members have ever heard of that Journal.

Phil's criticisms are merely the latest example of the sort of problem facing those many of us who try to keep aware of developments in our particular interests but without the benefit of access to a good library. The opportunity for regular browsing through the library shelves of a university or the BM(NH) is a privilege available to only a few.

The cognoscenti will probably say that the local public library has a duty to obtain even obscure works (have you tried it lately?).

But that is not my main point, which is: how do I know what to ask for unless I know what to ask for? (If you don't understand that, re-read the first sentence above).

The problem is, therefore, one of communication. More of the conchological world will adopt the gospel according to Phil' Palmer (or anyone else) if they are aware of it and can read it, even in precis, summary or shortened version.

May I suggest:

- (a) authors provide a short summary of their papers for the Newsletter,
- (b) annual abstracts,
- (c) on the particular topic, another Paper for Students by Phil on classification and identification of Scaphopods of NW Europe.

Dennis R. Seaward

GENERAL NOTES

COURSES ON MOLLUSCS AT THE FIELD STUDIES COUNCIL

16-18 March 1984 (Friday-Sunday) Winkles or "What is a species?"

John Crothers. The four species of Littorina that we were taught as students are now thought to belong to eight or nine! What criteria can be used to separate them - and just what is a species anyway? Leonard Wills Field Centre, Nettlecombe Court, Williton, Taunton, Somerset. £44 (non-resident £24)

27-29 April 1984 (Friday-Sunday) Introducing slugs and snails

Simon Perry. An introduction to the diversity of land and freshwater snails found near Juniper Hall. As well as identification, the ecology, genetics, behaviour and general biology of this group will be studied. Juniper Hall Field Centre, Dorking, Surrey. £48

20-27 July 1984 Slugs and snails

Dr. Robert Cameron. An introduction to the identification and natural history of land molluscs in a surprisingly rich part of the countryside. Preston Montford, Montford Bridge, Shrewsbury. £110

25 July - 1 August 1984 Seashells, snails and slugs

June Chatfield. The course for anyone interested in molluscs will be designed to help beginners as well as those with some prior knowledge. Field excursions will

be made to study the shell life of rocky, sandy and muddy shores and two days will be spent collecting and identifying land and freshwater snails. Orielson Field Centre, Pembroke, Dyfed. £115

Dale Fort Field Centre, Dale, Haverfordwest, Dyfed, SA62 3RD 1-8 August
Diving the Skomer Marine Nature Reserve. £137

The Leonard Wills Field Centre, Nettlecombe Court, Williton, Taunton, Somerset,
16/17-19 February Life on the Lower Shore TA4 4HT £59 (Thur-Sun)
£44 (Fri.-Sun)

2-4 March	Predator/Prey relationship & variation in the dog whelk	£44
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Further information from the Field Centre concerned.

FREE BOOKS!

The Conchological Society has recently received a number of copies of the booklets published by the Linnean Society of London on the Synopsis of the British Fauna, No. 8, Slugs by H.E. Quick, published in 1949, and No. 13, British Freshwater Bivalve Molluscs by A.E. Ellis, published in 1962.

Both of these booklets are old editions but are still very useful. These are available free to members. If you are interested, please forward a stamped addressed envelope, at least 6" x 9", to:

Mr. A. Norris, Assistant Curator, Natural History, Leeds City Museum, Municipal Buildings, Calverley Street, Leeds, LS1 3AA

Please note that if more than one copy of each is required, the scale of postage listed below applies:

Quick	Ellis	
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PUBLICATIONS RECEIVED

Porcupine Newsletter, Vol. 2, No. 8 (July 1983). Editor, Frank Evans, Dove Marine

Laboratory, Cullercoats, North Shields, NE30 4PZ. Also Porcupine Membership List, June 1983.

Recent Cephalopoda in the Collections of the Royal Scottish Museum, Edinburgh; by David Heppell and Shelagh M. Smith; R.S.M. Information Series, Natural History, 10, March 1983.

Taxonomy of some Cape Verde Conidae, with description of a novel species; by Jan Elsen. Informations de la Societe Belge de Malacologie, Serie 11 No. 4, Juin 1983. Editeur Responsable, R. Duchamps, Avenue Mozart 52, 1190 Bruxelles. (Note: by 'Novel species' is meant new species, Conus poppei Elsen, dark cream with many thin dark brown streaks.)

The above may be borrowed at any time during the three months following appearance of this notice, by application to T. E. Crowley, [REDACTED], Bampton, Oxford, [REDACTED]

Louisa Stewart, Cockrem's Tourists' Guide to Torquay and its neighbourhood, Edward Cockrem, 10 Strand, Torquay; Simpkin, Marshall & Co., London. No date, c. 1854. Devonian fossils, p. 206-211.

The Torquay Guide, containing a description of the town, and of the most remarkable objects of interest in the neighbourhood, the excursions and walks, geology, climate, botany, etc. etc.. By several literary gentlemen, 3rd. edition, 1848. George H. Croydon, Teignmouth, 3/-. List of fossils (from J. Phillips's Palaeozoic Fossils), p. 119-122.

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Nature of the World, 19 Bell Lane, Fetcham, Leatherhead, Surrey.

ELSEVIER ANTIQUARIAN DEPARTMENT, Lippijnstraat 4, 1055 KJ Amsterdam - Netherlands specialises in Malacological journals and rare books. Please ask for specialised catalogues and offer us your set of Journal of Conchology.

CARDIIDAE WANTED by Harry Lee M.D., [REDACTED], Jacksonville, Florida, 32204, U.S.A. Parvicardium minimum (Philippi) [U.K.], P. ovale (Sowerby) [U.K.], P. scabrum (Philippi) [U.K.], Cerastoderma glaucum (Brug.), Acanthocardia spinosa (Lightfoot) [Mediterranean], Clinocardium ciliatum (Fabricius) [Arctic], Serripes groenlandicus (Brug.) [Arctic], Cerastoderma elegantulum (Beck) [Arctic]. I can offer Western Atlantic marine shells in exchange.

ANNUAL SUBSCRIPTIONS, 1984. The Annual Subscription for 1984 was due on 1st. January, and I should like to ask all Members who have not yet sent in their subscriptions to do so promptly without further reminder. Ordinary, Family and Institutional Members may deduct the sum of £1.00 (\$2.00) from the amount of all subscriptions paid in full before 31st. March.

Please note that votes in the election of Officers and Council will only be valid in the case of Members whose subscriptions are paid in full.

No further publications can be sent to Members whose subscriptions are unpaid, but any which have been withheld will be forwarded upon receipt of the arrears.

All cheques and postal orders should be made payable to the Society and sent to me, MARJORIE FOGAN (Hon. Treasurer), [REDACTED], Atherton, Manchester, [REDACTED]

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THE TROUBLE WITH THOSE JUVENILE DELINQUENTS...

For the writer of this paper, and perhaps for many fellow conchologists, the acquisition of a good binocular microscope opened a whole new area of interest. To take samples of shell sand, scraped from the surface of the shore at places where the wash of the sea has done some of the work and deposited accumulations of empty shells, permits one to 'take home the beach' and thereby enter into a new (and beautiful) world of microshells. At the same time, however, one is led into a world of uncertainty. Every time I sort through a sample of shell sand, it seems I am left at the end with a number of unidentified specimens. In the first place, some of the smaller shells are rather difficult to identify, notably the Pyramidellidae of which Shelagh M. Smith writes:

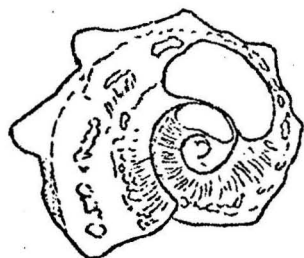
Shells of this family are difficult to identify and should if possible be compared with named specimens. The textbook descriptions are not always diagnostic and in some cases are conflicting.

I heartily concur with this. A second and major area of uncertainty lies in the identification of juveniles for which the standard literature and keys give us little guidance. Moreover, juveniles often present themselves in abundance in shell sand. Thus, shell-collecting with a microscope can become less a matter of certainty, more something to think about, to puzzle over, to research. One needs to be satisfied with that which is provisional rather than with established facts. In short, one is called upon to be happy with the excitement of uncertainty. This present paper is, in part, an expression of such uncertainties and it must be stated at the start that identifications attempted here should be regarded as no more than provisional; readers will doubtless form their own judgments.

How, then, can one deal with those juvenile and embryonic specimens whose characteristics can differ very substantially from those of the adult? They are often featureless, lacking the configuration, coloration and sculpture necessary for firm identification. One strategy is to collect a sufficiently large number of small shells to permit one - eventually - to build up a continuous series of specimens which will bridge the gap between the puzzling juveniles and the familiar adult form. The purpose of this paper is to share some of the writer's experiences in examining juvenile shells and perhaps demonstrate the intrinsic interest and lasting satisfaction that the collecting of microshells can give.

Let us begin with a particular problem which presented itself recently. Eight very small shells clearly of the same species and making a growth series

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1. Smith, Shelagh M.: Key to the British Marine Gastropoda (Royal Scottish Museum 1974) p.37.

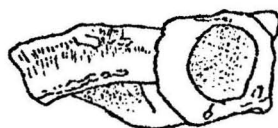


i

0 1mm



iv

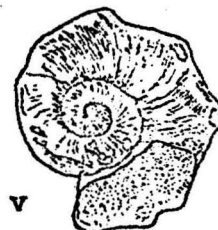


iii

Fig. 1



ii



v

Fig. 2

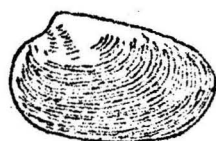


Fig. 3

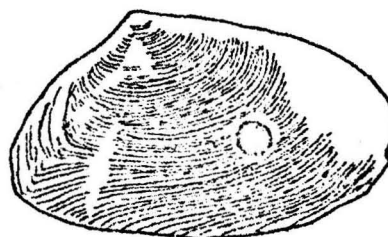


Fig. 4

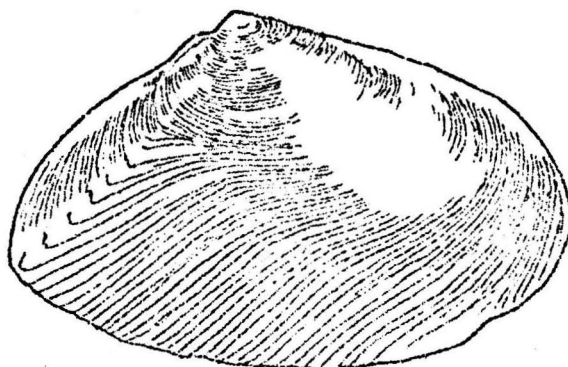


Fig. 5

0 1 2mm

were found by the writer in shell sand taken in 1982 in Hendaye in the Pyrénées-Atlantiques of France adjacent to the border with Spain. A search through Nordsieck¹ discovered nothing that remotely resembled the specimens in question. What could they be? In that corner of the Bay of Biscay the sea isotherms indicate that mean water temperatures are very high with, one assumes, likely consequences for the native flora and fauna. For example, in the same sample of shell sand were found specimens of Clathroconcha istriensis Coen 1933, a species which, according to Nordsieck, is recorded only in the Adriatic. The possibility of the shells being of an unexpected or exotic species seemed worth considering. Finally, careful drawings were produced by means of a camera lucida and sent to the Museum d'Histoire Naturelle in Paris where Dr. Philippe Bouchet at the Laboratoire de Biologie des Invertébrés et Malacologie was kind enough to attempt an identification on the evidence of my drawings alone. It appears that the drawings submitted compare well with scanning electron micrographs of juvenile specimens of Astraea (Bolma) rugosa taken in the Mediterranean and examples of this species have been found on the Basque coast also. The continuous size series in the possession of Dr. Bouchet linked the small shells with what is, at first sight, a most unlikely adult. Illustrations of two of my series of juveniles appear as Figures 1 i-v and a hand copy of Nordsieck's illustration² of the adult species is shown, for comparison, in Figure 2.

This was a case where my own continuous size series of shells did not extend sufficiently to make a connection with the adult form. In the case of other species, however, I feel I have achieved some successes without having recourse to outside help.

Let us first consider Tellina fabula with its characteristic oblique striations on the right valve. Figure 3 shows a small, juvenile Tellina. Is it, or is it not, T. fabula? The crucial point is whether or not the characteristic oblique sculpture of the adult shell is also present on small juveniles. An examination of the umbo area of clearly identifiable and unworn adults shows that such sculpture is not, in fact, present on very small shells. Figure 4 shows a slightly larger shell (pierced by a predator) on which the oblique striations are just beginning to form and Figure 5 shows a more mature (but still small) specimen on which the markings are well established. By bringing these three shells together one may feel that the smallest specimen could be T. fabula though more work may need to be done with T. tenuis as an alternative possibility.

Divaricella divaricata is a very rare shell in British waters, but can be found fairly frequently, though not in abundance, in French Atlantic waters once one has 'turned the corner' of the Brest peninsula. The next three illustrations (Figures 6, 7 and 8) show three specimens of a series which enabled me to link an unidentified, rather featureless juvenile with the adult form. It will be seen from Figure 6 that the early shape is not nearly so rounded as the adult. Figure 7 shows the first formation of the wavy lines which are so characteristic of the sculpture of this species.

I have taken a fair number of small specimens of Notirus irus from shell sand at several locations in France. Once again, the specimens illustrated here were taken from a sample of shell sand (particularly rich in juveniles) scraped from the shore at Hendaye. It will be seen that the juvenile in Figure 9 has developed only vestigially the frills which characterise N. irus, but the outline and sculpture match the configuration of the earlier growth stages shown on the larger shell of Figure 10. Taken alone, the valve shown in Figure 9 might have proved a puzzle.

1. Nordsieck, F.: op.cit. (1968 & 1972)

2. Nordsieck (1968): 17.20

0 1 2 3 mm

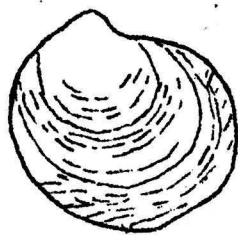


Fig. 6

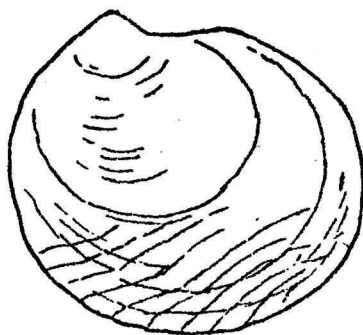


Fig. 7

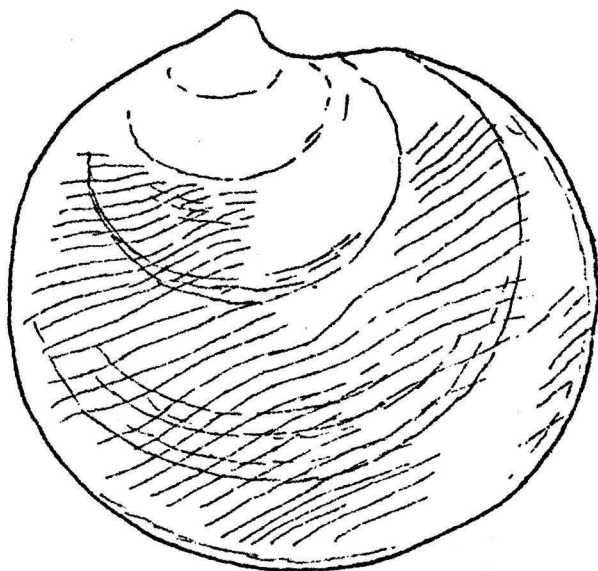


Fig. 8

0 1 2 3 mm

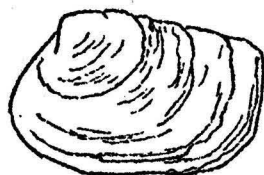


Fig. 9

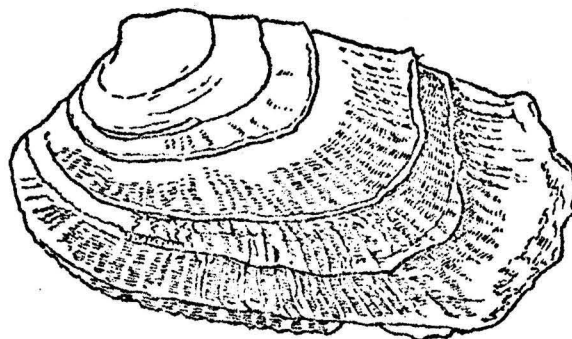


Fig. 10

0 1 2 3 mm



Fig. 11

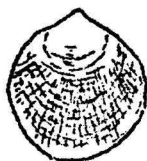


Fig. 12

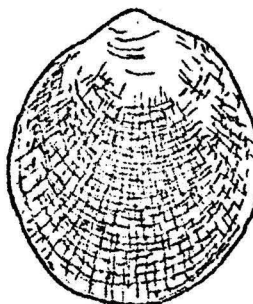


Fig. 13

To leave France for a moment, let us turn to Crenella decussata collected from the coast of Northumberland, more nearly my home ground. Figure 11 shows the almost circular form of the juvenile without the radiating sculpture which, crossing the well marked concentric lines of older shells, makes up the decussate surface. Figures 12 and 13 show progress towards the adult form which, as well as being decussate, is higher. What it has not been possible to show on the camera lucida drawings is the contrast between the pearly-white appearance of the smallest shell and the progressive development of the silvery-brown coloration of the adult.

The first very small shells I found of Diodora apertura seemed to be different from adult forms already in my possession though (since they had a 'keyhole') they seemed to be allied to that species. As I have since discovered, Fretter and Graham do, in fact, show a drawing of a juvenile D. apertura which corresponds well with my specimens.¹ The problem was that the smallest specimens had a curved, beaked apex which on the adult shell is usually worn off. Figure 14, i and ii show two views of a very small specimen. The dorsal view shows how the slit present in the embryo has been progressively sealed up to leave the 'keyhole' of the adult.² The side view shows the curved beak and, just visible, the protoconch. As before, the last illustration in this series shows an older juvenile for comparison (Figure 15). Here the 'beak' is still present though evidence of the slit has been obscured by wear or shell growth.

Caecum glabrum is an interesting species. It begins life as a close spiral, but after the first minute whorls this spiral suddenly becomes very evolute. As Caecum lives out its life in the interstices between grains of sand, an evolute shell capped with a tight spiral would prove highly inconvenient since it would impede free movement. The mollusc, therefore, seals off its tube and cuts off unwanted, empty segments of its earlier shell, starting with the spiral piece.³ Figure 16 shows the embryonic whorls of a C. glabrum 'decollated' in this fashion some time after the change to evolute form. Figure 17 shows, however, that this decollation can occur earlier, before the shell becomes evolute, leaving only a transparent white spiral shell which has the size and rather the appearance of a white Omalogyra atomus. If one had not made the connection with intermediate specimens of C. glabrum, such a shell might prove difficult to identify. Figure 18 shows a later decollated piece of C. glabrum with its neatly sealed apical end.

The reticulate sculpture of Alvania punctura (particularly on an unworn specimen) makes it a most attractive shell. Figures 19, 20 and 21 show three out of a continuous series joining the embryonic shell with the adult form. It will be noted that the smallest specimen has just the beginnings of the characteristic sculpture and, moreover, has a more globular configuration.

The Triphorids to be found in France are more complicated than the popular literature would suggest. In an article in the Journal of Molluscan Studies⁴ it is suggested that the name Triphora perversa should be reserved for the species originally identified in the Mediterranean and that those which are found in the Atlantic should more properly be named T. adversa. In addition to T. adversa,

1. Fretter, V. & Graham, A.: op.cit. (1962) p.71.

2. Ibid. p.69: 'In...Diodora the young shell looks like an Emarginula, with a marginal slit, but with further growth the mantle edges come together again at the lower end of the slit, re-unite and so convert what was an emargination into a perforation through the mantle skirt'.

3. Ibid. p.68.

4. Bouchet, P. & Guillemot, H.: 'The Triphora perversa-Complex in Western Europe' in Journal of Molluscan Studies, Vol. 44 (1978) pp.344-356.

Fig. 14



i



ii

0 1 2 3 mm

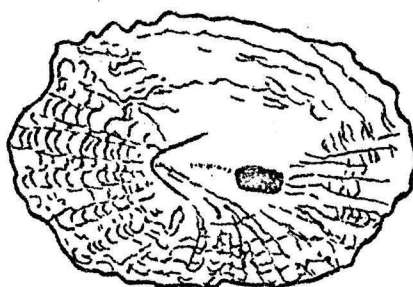


Fig. 15

0 1 2 mm



Fig. 16



Fig. 17



Fig. 18

0 1 mm

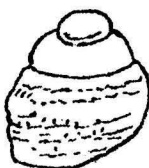


Fig. 19

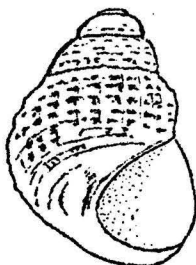


Fig 20



Fig. 21

three other Atlantic species are identified principally on the basis of differences in anatomy but involving also slight differences in shell form and sculpture. For identification of specimens, readers are referred to the excellent photographs in this article. It needs to be added that, in the absence of the living animal, identification is not easy. Figure 22 shows an embryonic specimen of a Triphora sp. and it will be seen that the first sculpture is quite different from that of the mature shell.

A similar condition is found with some of the Turridae. My next illustration (Figure 23) shows a specimen of what I believe to be Philbertia asperrima having still the first 'cross-hatched' sculpture which is usually worn off in the case of more mature shells.

Superficially similar to the Triphorids, though dextral not sinistral, are the Cerithiopsidae. Figure 24 shows the early shell of a Cerithiopsis sp. of which the first $3\frac{1}{2}$ whorls are quite smooth. After the first whorls there is a sudden, dramatic transition to the granular forms of the adult sculpture. Figures 25 and 26 show two views of the same shell of another Cerithiopsis (C. fayalensis, I suspect). The specimen is rather polished by wear, but the ribs on the early larval whorls are clearly visible, together with the transition to near-adult sculpture.

Littorina littorea is a very common, well-known species but its juvenile form is unexpectedly different from the adult. Figure 27 shows a juvenile specimen taken, this time, in Aberystwyth.

Let us turn now to the illustrations of the two species of Philine (Figures 28 and 29). The larger specimen is clearly Philine catena, but doubts persist about the identity of the smaller. It certainly bears the chain-like sculpture characteristic of P. catena, but the outline is different and the 'toothed' edge at the top of the aperture is not present in the adult form. Two examples of similar size of this smaller form were taken at Ile Tudy in S.W. Brittany. Are these differences, one wonders, no more than the expected characteristics of the juvenile form?

As mentioned above, the Pyramidellidae are notoriously difficult to identify without reference to a standard collection. Some (but not all) of the species of Odostomia¹ show heterostrophy, that is to say the embryonic shell is sinistral but, after about two whorls, changes to dextral. To accomplish this feat of solid geometry, the shell needs to be laid over on one side and the mantle to begin to deposit shell material with a different orientation. Once again, my shell sand from Hendaye provides sufficient very small specimens of O. plicata to attempt a reconstruction of this process. Figure 30 shows what I believe to be a sinistral protoconch of O. plicata (rather like a minute reversed Philine). Figure 31 shows the first turn in a dextral sense and Figure 32 shows the next whorl of adult form with the 'folded' suture beginning to show. The next series of illustrations attempts to show diagrammatically and in sequence what appears to happen during this process of change. Figure 33i shows the protoconch. Figure 33ii represents the first sinistral whorl with x indicating that, for sinistral growth to continue, shell deposition would have to take place along a line from a through d to b. Figure 33iii shows the shell tipped over through 90° . One could suppose that if, now, the animal also accomplished a 90° turn within its shell so that the mantle laid down shell material from c round the base as far as and a little beyond b, then the shell would become dextral. Figures 33iv & v are respectively an abapertural and an apertural representation of how this could happen and show the first tooth from the developing columellar fold. Figures 30, 31 & 32 of real shells correspond to Figures 33i, iv, v & vi in the

1. Fretter & Graham, op. cit. pp.472-473.

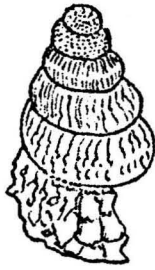


Fig. 22



Fig. 23



Fig. 24



Fig. 25



Fig. 26

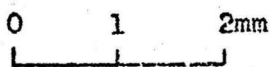
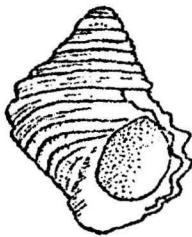


Fig. 27

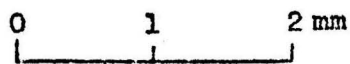


Fig. 28

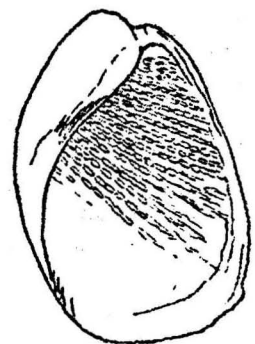


Fig. 29



Fig. 30



Fig. 31

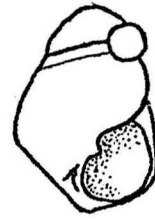
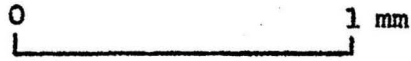
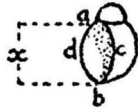


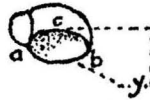
Fig. 32



i



ii



iii



iv



v



vi

Fig. 33

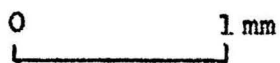
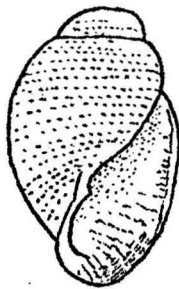


Fig. 34

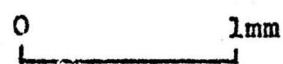
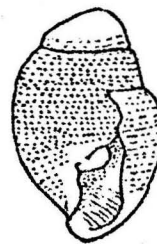


Fig. 35

notional representation and seem to support this reconstruction of events.

It is not claimed here that the ideas and identifications put forward are necessarily accurate. One hopes, however, that the point is properly made that the whole process of speculation is per se interesting - at least as interesting as the 'mere' possession of known shells in a collection. I should like to end this paper with uncertainty, by presenting two further specimens for which I can as yet offer no identification. Perhaps a further visit to Hendaye in the future will provide the necessary clues. Reference to Nordsieck¹ somewhere between Acteon and Ringicula may give an uncertain hint. The specimens are (Figure 34) unidentate and punctate and (Figure 35) bidentate and punctate. Suggestions from readers will be gratefully received.

Details of all the shells in the illustrations are given in a separate list. All the Figures except 2 and 33 were done with a camera lucida.

1. Nordsieck (1972).

LIST OF ILLUSTRATIONS

1. Astraea (Bolma) rugosa (L.)
 - i. Abapical view Width: 1.6mm
 - ii. Apical view
 - iii. Apertural view
 - iv. Smaller specimen: abapical view
 - v. Do.: apical view
2. Astraea (Bolma) rugosa (adult) After Nordsieck (1968): 17.20.
3. Tellina sp. Lth. 1.9mm Ht. 1.3mm
4. Tellina fabula Lth. 2.86mm Ht. 2.15mm
5. T. fabula Lth. 5.29mm Ht. 3.43mm
6. Divaricella divaricata Lth. 2.14mm Ht. 2.14mm
7. D. divaricata Lth. 3.36mm Ht. 3.0mm
8. D. divaricata Lth. 5.5mm Ht. 5.29mm
9. Notirus irus Lth. 1.9mm Ht. 1.22mm
10. N. irus Lth. 4.1mm Ht. 2.28mm
11. Crenella decussata Wth. 0.56mm
12. C. decussata Wth. 1.25mm
13. C. decussata Wth. 2.25mm
14. Diodora apertura
 - i. Small specimen, dorsal view. Lth. 1.62mm Wth. 1.06mm
 - ii. Same specimen, side view. Ht. 0.62mm
15. D. apertura Lth. 3.75mm Wth. 2.44mm
16. Caecum glabrum Ht. 0.54mm
17. C. glabrum Ht. 0.28mm
18. C. glabrum Ht. 1.6mm
19. Alvania punctura Ht. 0.40mm Wth. 0.40mm
20. A. punctura Ht. 0.77mm Wth. 0.55mm
21. A. punctura Ht. 1.25mm Wth. 0.74mm
22. Triphora sp. Ht. 0.75mm Wth. 0.40mm
23. Philbertia asperrima (?) Ht. 1.56mm Wth. 0.9mm
24. Cerithiopsis sp. Ht. 1.11mm Wth. 0.61mm
25. Cerithiopsis fayalensis (?) Ht. 0.73mm Wth. 0.39mm
26. C. fayalensis Same specimen, apertural view
27. Littorina littorea Ht. 2.15mm Wth. 1.8mm
28. Philine catena (?) Ht. 1.5mm Wth. 1.1mm
29. P. catena Ht. 2.4mm Wth. 1.78mm
30. Odostomia plicata (?) protoconch. Wth. 0.18mm
31. O. plicata Wth. 0.29mm

32. O. plicata Wth. 0.40mm Ht. 0.61mm
33. O. plicata Notional representation of heterostrophy process
34. Gastropod, unidentate, punctate. Ht. 1.29mm Wth. 0.82mm
35. Gastropod, bidentate, punctate. Ht. 1.1mm Wth. 0.71mm

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December 1983. J. E. Phorson, [REDACTED], Belmont, Durham, [REDACTED]

A TALE OF NAME-CHANGING IN THE ORDER ASCOGLOSSA

Grube

In the Spring of 1853 Dr. Adolph Grube, Professor of Zoology in the University of Breslau, travelled to the northeast corner of the Adriatic coast to collect marine invertebrates and, if possible, find some new species. He stayed for a while at Trieste, but his main centre was Fiume (now Rijeka, Yugoslavia). From here he visited the lovely summer resorts and fishing villages that line the Bay of Rijeka. Near St. Nicolo he discovered a beautiful ascoglossan. He thought it was a new species and named it Elysia splendida. In 1861 he published an account of his expedition in the form of a diary in which he described the external features of E. splendida as follows:

"The body and the large, upturned, mantle-like parapodia were velvety-black. The outer border of the parapodia and the mouth were orange yellow. The parapodial borders undulated in a most delicate manner. Below each border was a band of ultramarine blue. Below this again was a silvery stripe that was broken at intervals by light green, and below the stripe was a longitudinal row of silver dots. Posteriorly, the parapodial border of one side was continuous with that of the other side, but the blue band was here interrupted.

An oval spot of most beautiful white lay between the white inner sides of the rhinophores, which otherwise were black with their apices tipped with blue. The rhinophores were one quarter of the total length. Sometimes they were pressed backwards, sometimes they were wide apart, often with their extremities gracefully wound with a flat spiral of one turn".

Grube illustrated his description by three chromo-lithographs. The largest one depicts the animal in a strange attitude for the head is bent backwards so that it lies on the dorsal surface of the body. This is part of the animal's remarkable evasive action that was described by Gascoigne (1982).

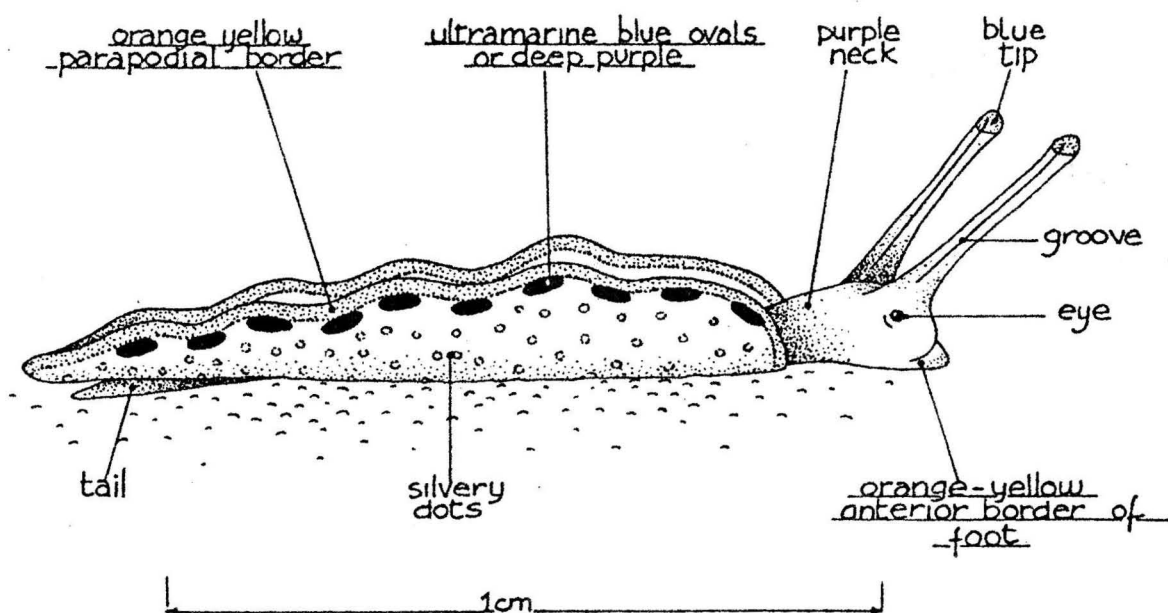


FIGURE 1

A colour diagram of E. hopei (formerly known as Elysia splendida, Thuridilla splendida, and Thuridilla hopei)

The diagram was drawn from living E. hopei with the aid of a X10 lens. They were collected by Dr. Salghetti-Drioli in June at Quercianella, near Livorno, from rock surfaces at a depth of about 5 metres.

The three main features of the pattern are: an orange-yellow border of the parapodia, a blue band (or ovals), and the foot had a yellow anterior border.

The body colour is variable and can be brown to black, or violet to purple. As with Butterflies so with sea slugs; their beautiful colours are the end-products of intracellular digestion. The colours of E. hopei suggest it feeds on more than one species of algae, or minor genetic changes have produced two main varieties var. nigra and var. purpurea.

Bergh

Dr. Rudolph Bergh requested Grube to send him some specimens of Elysia splendida for anatomical examination. Grube sent him three specimens of length 3-5 mm. They were preserved in alcohol and contracted so that the head lay backwards on the dorsal surface. Even with a modern binocular dissection microscope, dissections of such poor material would be very difficult. Bergh did the best he could. His method was to patiently pick off bits and pieces, layer by layer and to transfer them to slides. These were then examined with a microscope, drawn, and then reassembled into systems (alimentary, reproductive, etc.) in a descriptive text. Bergh had achieved remarkably good results with other ascoglossans by this method. It is not surprising that with E. splendida his results were meagre. Nevertheless, in 1872 he published his findings together with 12 figures which illustrate the "bits and pieces" method at a low level. On slender evidence he proposed a new genus so that E. splendida became Thuridilla splendida.

Verany

In the 1950s several ascoglossan specialists were aware that Verany had published a description of the species a few years earlier than Grube. Verany called the species Actaeon hopei. The genus (Actaeon Quatrefages 1844) is now obsolete; it contained species now known as Pelta coronata, Limapontia cocksi and Elysia viridis. The specific name hopei was in honour of Hope who had collected the species at Villefranche and at Naples. Verany's brief description began with the sentence "Cette espèce a des formes moins élancées que l'A. viridis, l'extrémité de corps moins aiguë et les tentacules plus gros". It included a reddish parapodial border, a blue band, a yellow anterior border of the foot, white lines and silvery dots.

By a correct application of the Law of Priority and the retention of the genus Thuridilla the species name was changed to Thuridilla hopei (Verany) 1853. Pruvot-Fol (1954) was probably the first to use this name which has since appeared in standard works and fauna lists.

Thompson

Thuridilla is a monotypic genus, that is to say it contains only one species. Monotypic genera were common in Opisthobranch classifications of the 19th. century, mainly because little was known about the anatomy of the type species and that of related species. Recently several monotypic genera have been removed from ascoglossan classification. T. E. Thompson (1981) gave reasons for regarding the generic characters of Thuridilla as unsound. Moreover, he pointed out Thuridilla hopei has many characters of the genus Elysia so that the species could return to its original genus, Elysia.

Recent research supports Thompson's proposal to transfer T. hopei to Elysia. The detailed thesis by Sanders-Esser (1982) shows that the reproductive systems of Elysia viridis and Thuridilla hopei are alike. Also Gascoigne (paper in the press) observed that the penis, copulatory position, and method of sperm transference of E. hopei are similar to those of E. viridis.

There are two morals to this tale. Make sure that 'the new' species has not been described previously. Before proposing a new genus a sound knowledge of the anatomy of the type species is advisable.

ACKNOWLEDGEMENT

I thank Norah Kenna for drawing Figure 1 from my rough sketch.

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Tom Gascoigne

REDISCOVERY OF COCHLODINA LAMINATA ON KINNOULL HILL, PERTSHIRE

In a paper on Perthshire molluscs, Henry Coates (Trans. Proc. Perths. Soc. Nat. Sci. 7 [1923]) outlined the history of the colony of Cochlodina laminata on the cliffs of Kinnoull Hill near Perth, from its discovery by Dr. F.B. White in 1869 to 1920 when the site was again visited by Mr. E. Crapper of Dundee. The collections of Perth Museum and Art Gallery contain specimens from Kinnoull Hill collected by Coates and White in 1880. According to an unpublished MS by one F. Smith dated 1908 (Perth Museum & Art Gallery, archive 490) "it has not been found by anyone since about 1885 and is supposed to have been exterminated." However, a letter to Coates from Crapper dated 19.2.1922, also in Perth Museum, records the taking of a number of C. laminata in August 1920 and March 1921. In 1924 the trees on the hill were clear felled and by 1928 the talus slopes beneath the cliffs had been planted by the Forestry Commission (information from Perth & Kinross District Council 1983 Kinnoull Hill Management Plan). These events were thought to have destroyed the colony, which was apparently confined to a small area at the base of the cliffs.

In August 1983 I visited the hill with Dr. R.C. Preece who noted the suitability of the habitat for C. laminata and recommended a return visit - on a rainy day! I subsequently visited the hill on the evening of 4.9.1983 and examined a small area at the base of the cliff (Grid ref. 37/131224). Several specimens of a large clausiliid were obtained from the trunks of sycamore saplings and the adjacent rock face. These were subsequently identified by Dr. Preece as C. laminata and have been deposited in Perth Museum. No doubt the presence of calcium carbonate from the lavas and tuffs which make up the cliffs and their warm southerly aspect are factors which influence the site of the colony, the limits of which have yet to be determined.

Kinnoull Hill is shortly to be designated as an SSSI by the Nature Conservancy Council.

M. Taylor, Keeper of Natural Sciences, Perth Museum & Art Gallery

NOTE ADDED BY DR. KERNEY:

There are very few records of Cochlodina from Scotland. The only known occurrences which lie to the north of Kinnoull are at Craighall Woods SSSI (37/1748) and Milton Wood NNR (37/1750) in Perthshire, both found by Dr. R.A.D. Cameron in 1982; at Den of Airlie (37/2952) on the borders of Perthshire and Angus, also found by Dr. Cameron (1980); and - much further away - at Muchalls in Kincardine (37/89; N.G. Hadden, 1910, Conchological Society Census MS). However, this area of eastern Scotland is rather poorly recorded for molluscs and it is not unlikely that close search will reveal further sites. It may also be mentioned here that Kinnoull Hill has provided the most northerly British record of the very rare Truncatellina cylindrica (F. Smith and H. Coates, circa 1910; Conchological Society Census MS).

A VISIT TO THE BUDE CANAL AND ADJACENT BUDE MARSH

Owing to the generally acid conditions and the absence of slow-flowing rivers or canals, Cornwall is poorly represented by the freshwater Mollusca. For this reason the Bude Canal, situated in the far northeast of the county, stands out as an unusually rich locality, although compared with freshwater habitats in other areas of the British Isles it cannot be considered exceptional. Nevertheless, this unique Cornish site has in the past attracted the attention of, and been visited by, many conchologists, including Charles Oldham and A.E. Boycott.

I have long considered it desirable that the canal should be revisited, mainly to confirm the continued presence of previously recorded species and to note any new arrivals. Consequently the canal was visited by Stella M. Turk, Barbara Stephens and myself on the 10th. June 1983. An area of marshland adjacent to the northern end of the canal has been designated a Local Nature Reserve and Stella Turk and Barbara Stephens, accompanied by the Reserve's Hon. Warden, Mr. P. Truscott, decided to concentrate their efforts on the marsh, while I examined the canal.

The bottom of the canal is composed of several centimetres of extremely soft clay-like mud; a firmer substratum, more favourable to molluscs, seems to be absent. Data supplied by the South West Water Authority indicates that the pH value of the water is in the range 7.50 to 8.00.

Overall the canal proved to be disappointing and I failed to find two of the rarer bivalves for which the canal is known. The first section examined, stretching from the sea looks south to Rodd's Bridge, was virtually devoid of both aquatic vegetation and molluscs, although fish were present. This stretch had previously been reported in 1977 to be polluted and a herbicide has been applied since then to control weed growth. The only species collected from this area was Anodonta anatina.

Between Rodd's Bridge and Helebridge a sharp contrast in habitat was evident. The banks of the canal were thickly fringed with reeds and the waterway was almost choked in places with submerged aquatic plants. However, even here the variety of mollusc species was limited and the populations by no means abundant. Most disappointing was my failure to find Pisidium henslowanum and P. moitessierianum, previously recorded from the canal. It is of course possible that I simply failed to collect them on this occasion despite several hours work, but their continued existence here must remain uncertain. A single juvenile example of Lymnaea auricularia, new for Cornwall from a natural habitat, was a welcome find.

Bude Marshes, 5½ acres in extent, are dominated by the common reed, Phragmites australis. The entire area is intersected by ditches and recently excavated pools, and the proximity of the site to the coast and sandy beaches is responsible for some maritime element in the vegetation and a neutral or slightly calcareous habitat.

Molluscs collected from the Bude Canal and adjacent Bude Marshes, SS/20-05- and 21-04-. Abbreviations: C = Canal; M = Marshes.

Valvata cristata Muller (C)
Lymnaea truncatula (Muller) (C & M)
Lymnaea peregra (Muller) (C)
Cochlicopa lubrica (Muller) (M)
Arion silvaticus Lohmander (M)
Oxychilus alliarius (Miller) (M)
Deroceras reticulatum (Muller) (M)
Cepaea nemoralis (L.) (M)
Sphaerium lacustre (Muller) (C)
Pisidium casertanum (Poli) (C)
Pisidium nitidum Jenyns (C)

Potamopyrgus jenkinsi (Smith) (C & M)
Lymnaea auricularia (L.) (C)
Oxyloma pfeifferi (Ross.) (M)
Arion ater (L.) agg. (M)
Oxychilus cellarius (Muller) (M)
Zonitoides nitidus (Muller) (M)
Ashfordia granulata (Alder) (M)
Anodonta anatina (L.) (C)
Pisidium amnicum (Muller) (C)
Pisidium subtruncatum Malm (C)

John Humphreys

"HOW DO I KNOW WHAT TO ASK FOR UNLESS I KNOW WHAT TO ASK FOR"?

As no doubt many members will know Sea Area Solway S25 has come in for a considerable amount of unfortunate publicity during recent years, and certainly during the past eight months our Cumbrian coastline and much of its waters have featured widely in the media in connection with radioactivity. Whilst I have no wish to enter or continue any debate here, far too much has been said, much of it complete and utter rubbish, destined to stir up feelings and emotion. Living close to the scene and having had a considerable stretch of our coastline closed to the public (and remains so) during the past few months, I have been trying to see some sunshine between the clouds of woe and find out what, if anything, the emissions from Sellafield are doing to our marine life. Without doubt the waters of the Irish Sea are almost certainly the most thoroughly monitored of any, virtually all of which is government sponsored. So what am I looking for? Do we have among our membership anyone with the necessary scientific knowledge who can provide me with guidelines or papers, literature etc. outlining the effects of radioactivity in its various forms upon marine conchology.

I can well understand that following some of the TV programmes screened during recent months, members will expect that those of us living in West Cumbria must be walking sparking plugs, who light up when shaking hands, and that the waters around our coastline are barren. This is far from the case. We certainly have a few 'bright sparks' but that's nothing to do with radioactivity and apart from a few sections of the coastline, which are affected by industrial reclamation, it would appear that our waters are as prosperous as ever and flourishing - however what should I be looking for as we walk the shore line, study the littoral zone and dredge offshore. Has anyone any ideas? Other than the above, may I thank you for a steady and continuous supply of interesting and invaluable information via the Newsletter and the Journal.

On another matter, have we any member in Germany with a dual interest in both conchology and the English language. I am interested in furthering my German and knowledge of Deutsche marine life.

Norman Hammond, [REDACTED], Aspatria, Carlisle, Cumbria, [REDACTED]

PAX CARTHAGINIS - A VERY OLD GAMESMANSHIP

A rejoinder to Dennis Seaward's reply in Conchologists' Newsletter, No. 88, p.157

One attractive aspect of the Conchological Society is that it is full of nice people. My impatient article on referring to scaphopods earned me, of all things, compliments. Nice compliments too: 'witty' and 'erudite'.

But Dennis apparently missed the point of the article which was, after all, to inform readers of the 'state of play' and, at the same time, to chide them gently for their unawareness of it. He seemed to see only the chiding and asked 'How do I know what to ask for before I know what to ask for?' To which I can only reply in the same vein 'How can I tell you before I tell you?'

Since I am also charged with publishing in that 'obscure' international journal Veliger we may expect an irate Californian malacologist to exclaim 'Conchologists' Newsletter - what the devil's that?'. However, the obscurity, or otherwise, of Veliger is irrelevant; for, a reading of my 1974 paper was not necessary in order to realise that Dentalium Linne 1758 was not, is not and cannot be synonymous with Scaphopoda Bronn 1862.

The information is widely available and was not newly-minted in 1974. It is present in Edward Step's 'Shell Life' (1927, p.411); in Nora McMillan's 'British Shells' (1968, p.73); in the M.B.A.'s 'Plymouth Marine Fauna' (1957, p.319); in Winckworth's list of 'The British Marine Mollusca' (1932, p.238); in Stella Turk's 'Concordance to the Field Card etc.' (1973, p.44); and finally it is on the reverse side of the ubiquitous field card 'Marine Mollusca 44-49' where we find 'Scaphopoda 479' as a heading, class- or group-name, with '201 Dentalium enta agg' as a subsection.

Come now, no more protesting, you haven't a leg to stand on. Calling all scaphopods 'Dentalium' is as bad as calling all gastropods Helix; and if you read that as a threat - well - Helix lapicida, Helix planorbis, Helix janthina, Helix vivipara, even Helix auricularia! and you can't complain about that lot because they are all in the 10th. edition of Systema Natura - another 'obscure' publication.

Phil' Palmer

A NOTE ON THE DISCOVERY OF HYGROMIA CINCTELLA (DRAPARNAUD) IN DORSET

Hygromia cinctella has hitherto only been recorded from South Devon. However in November 1982 at least half a dozen living specimens of this species were discovered at a site only $\frac{1}{2}$ mile from the centre of Weymouth in Dorset. The site of the colony is a small patch of rough grass and brambles, roughly 20 by 25 metres, in a neglected corner of an otherwise well-maintained College grounds.

This may well represent a natural increase in the range of this species. Weymouth shares many features; a coastal setting and very mild climate, with the Torbay area of Devon. It would be interesting to ascertain whether Hygromia occurs in the intervening area of West Dorset and East Devon. Coastal towns like Bridport or Lyme Regis may well repay investigation. On the other hand it may be the result of a fresh introduction. Weymouth has a small harbour and a regular ferry service to the continent.

The colony will be watched in the future to see if it is expanding or only a transient feature, and other suitable localities around Weymouth investigated.

Ian Cross

MOLLUSCS FROM A DISUSED NORFOLK RAILWAY EMBANKMENT

From a botanical point of view, disused railway lines have been shown to provide excellent habitats for many rare and restricted species.

Disused lines in Norfolk are equally interesting, especially those stretches of line including cuttings and embankments. Most of the lines were closed during the 'Beeching era' between 1963-1969, and have, therefore, been unmanaged for some fifteen to twenty years. Prior to the closure many lines were regularly sprayed with herbicides, at least since the 1930's. Used tracks are therefore virtually devoid of plant life and presumably molluscan life as well.

Colonization of the disused lines has taken place over the past twenty years or so, rapidly by plant life and more slowly by other faunas. The adjacent vegetation and environment to the disused lines is important as it is from these areas that the initial colonists will first migrate.

The surface of the railway tracks is mainly composed of blast furnace slag or 'clinker' overlying further layers of ash, shingle or sand producing a very stable and well-drained surface. In more undulating country the excavated material from cuttings is often used to fill in the nearby embankment. In parts of Norfolk, where the chalk is just beneath the surface, the excavated material forms embankments consisting largely of chalk infill.

One such embankment is found at Narborough, some eight miles south east of King's Lynn. Short grasses and other plants cover most of the site. However, near the parapet of a bridge the grass was somewhat longer, over-shadowed in some places by bramble bushes. The side of the embankment is unfortunately being encroached upon by saplings and bushes from a small deciduous wood at its base.

A visit was made to Narborough on 30 July 1983. It was a hot dry day during a period of prolonged hot weather and not at all suitable for recording molluscs! The whole site was very dry.

On the top of the embankment dead Candidula intersecta (Poiret 1801) were commonly found. Amongst the chalk and soil on the slope of the embankment Pupilla muscorum (Linn. 1758) and Vallonia excentrica Sterki 1892 were found. In deeper layers the so-called blind snail, Ceciloides acicula (Muller 1774) was recorded.

The longer grasses near the parapet provided a slightly damper, or more correctly, a less dry environment. Here were found Clausilia bidentata (Strom 1765), Monacha cantiana (Montagu 1803), Vitrina pellucida (Muller 1774), and Trichia hispida (Linn. 1758).

A single living specimen of Cochlodina laminata (Montagu 1803) was also found here, but this was possibly an exile from the nearby wood.

The encroaching woodland at the base of the embankment provided a much damper, more shady environment and here the following species were recorded: Cochlodina laminata, Clausilia bidentata, Punctum pygmaeum (Draparnaud 1801), Aegopinella nitidula (Draparnaud 1805), Oxychilus alliarius (Miller 1822), and Trichia hispida.

These chalk embankments in Norfolk are seen as some of the most important remaining chalk habitats in the county, and it is to be hoped that some stretches of disused line will be conserved, and some form of scrub control instigated to prevent complete overgrowth of the grassy areas by invading shrubs and saplings.

From a molluscan point of view no doubt further visits during more suitable climatic conditions would be more productive. For example neither Helix aspersa or either of the Cepaea species were recorded although almost certain to be present.

I should like to thank Dr. M. P. Kerney for confirming some of the records.

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K. S. Erskine

PERIODICALS RECEIVED

NOTE: All items mentioned will be held by T. E. Crowley for three months after issue of this News Letter so that any members who wish may borrow them during this period.

Poirieria, Vol. 13, No. 1, Aug. 1983 (Conchology Section, Auckland Institute & Museum: Editor Derek Lamb)

This issue of 70 pages deals exclusively with the landshells of the Waitakere Range. The report is the result of time-consuming and arduous surveys of mollusca, notoriously difficult to classify, which are found in the region of the narrow neck which occurs half way up New Zealand's North Island; Auckland is the nearest city.

The report is an outstanding piece of work and each species described is illustrated with beautiful and convincing drawings, three a-piece. It must be remembered that the land shells of New Zealand total more than five hundred - about four times as many as in the British Isles but, as with us, the big majority of the species are small.

The report is the work of J. F. Goulstone and in eighteen months he has collected himself nearly all the hundred-plus species described, most of them in the 2 - 4 mm. range. He suggests the inter-relationships of the various groups thrown up, fully describes the habitats, and includes tables of frequencies. A few of the snails described may well be new to science but the author refrains from naming them evidently feeling that more research, including dissection, is necessary before they are finally pinned down. The report is most impressive and must be of permanent scientific value.

Porcupine Newsletter, Vol. 2, No. 2, Nov. 1983 (Frank Evans, editor, Dove Marine Laboratory)

This is a large issue, the main contents comprising full reports, with scientific conclusions, of field meetings to Menai Bridge and Newcastle; 'Meristic and Biological Variation in British Atherinids' by R. Bamber and P. Henderson; 'Fishes of the Tropical Central Atlantic Islands' by A. J. Edwards; 'Guillemot and Fish Distribution in the North Sea' by M. L. Tasker; 'Northumberland's Fishes: a Historical Review' by P. Davis; 'Humpback Whales in the North Atlantic' by A. R. Martin; 'Power Stations - the ultimate Filter-feeders?' by A. W. H. Turnpenny; 'Luth. Dermochelip coriacea in Scotland' by R. Sutcliffe; 'Why don't Fish show a poisson Distribution?' by R. N. Bamber; and 'Nethrops Larvae Surveys in the western Irish Sea in 1982' by J. H. Nichols and B. M. Thompson. There is also a survey of the Fisheries Laboratory, Lowestoft, reviews and correspondence.

"Recent Cephalopoda in the Collections of the Royal Scottish Museum" by David Heppell and Shelagh M. Smith (RSM Information Series, Natural History 10) March 1983.

Both authors have addressed the Society on this subject at various times in the past and one result of their labours is this book which contains no less than sixty pages of entries resulting from a thoroughgoing inspection of the material and records in the Museum. There are also copious references and a useful index to collectors and collections.

The authors remark that many specimens in the collections were found to have been misidentified; the original inventory dates back to 1812.

"Taxonomy of some Cape Verde Conidae: with description of a novel species" by Jan Elsen (Informations de la Societe Belge de Malacologie: Editor R. Duchamps, Av. Mozart 52, 1190 Bruxelles). Serie 11, No. 4, June 1983.

Conus irregularis Sowerby, 1857 and Conus crotchii Reeve, 1849 are reconsidered as valid species. Conus poppei, a 'novel species' from the Cape Verde Islands is described. The author states that the new species is highly distinctive and lists holotype (figured by a coloured photograph) and seven paratypes. The anatomy is unknown at present.

"Porcupine Newsletter", Vol. 2, No. 8, July 1983.

Articles of particularly molluscan interest include 'Races of Mytilus on North Sea Rigs' by A. H. Burfitt; 'Rhosneigr and Barns Ness: a comparison of winter Shores' by Shelagh Smith and Fraser Gault, and 'The Distribution of Intertidal Animals and Plants round the coast of Ireland' by D. J. Crisp.

"Of Sea and Shore", Vol. 13, No. 1, Editor T. C. Rice, Port Gamble, Washington 98364, U.S.A.

Contents include an article on shelling on Nauru Island by Dan Lee; 'Systematic Classification of the Polyplacophora of the West Coast of North America' by R. N. Clark; 'Xenophora digitata von Martens - the missing Link' by Kate St. Jean; 'A Study of Bivalves' by Frank A. Roach; 'Shelling in the Port Canaveral Shell Dump' by Marlo F. Krisberg; and a useful 'Bivalve Genera Identifier' by R. F. Wagoner. There is also an obituary of William E. Old, Jr.

"Hawaiian Shell News" for October 1983 contains a short article on Placostylus senilis (Gassies, 1869) by Tom Pain: this extraordinarily ponderous land snail, long extinct, comes from the Isle of Pines, New Caledonia in a stratum of sand; E. L. Layard reported in Victorian days that these shells were so common that they were used for mending the roads; but the present status of these shells seems unknown. Other articles include 'Phillipine Land Snails, 1: Batanes' by J. L. Barnett; 'After 40 years, a new Volute' by Frank McCamley, reporting Notovoluta gardneri Darragh, described in the Journal of the Australian Malacological Society; 'The ultimate in diversity - Conus halli by Richard Goldberg, and 'Masirah, the teleuri Island, Revisited' illustrated in colour.

"Poirieria", Vol. 13, No. 2, November 1983.

Linatella cutacea (Link, 1816) (Cymatiidae) is reported new to New Zealand by R. C. Grange. Colour patterns of Tawera spissa (Wesh., 1835) (Veneridae) are discussed by Ron Cumber and there is a further note on the vanishing Toheroa (see Vol. 12, No. 1, ante) by Norman Douglas, with further reasons for its even more rapid disappearance. 'Field' meetings and 'washups' are reported on.

T. E. Crowley

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 971st. (Ordinary) Meeting held on 17th. December 1983 at B.M.(N.H.)

In the Chair: Mr. Pain with 37 members and friends present.

Nominations and Elections: 2 full members

Backelau, Dr. T., [REDACTED], B-2600 Berchem (Antwerpen), Belgium
Zenetos, Miss A., M.Sc., Dept. of Zoology, University of Athens, Greece.

THE CONCHOLOGISTS' NEWSLETTER

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CONCHOLOGICAL COSMETICISM

Sooner or later most of us try to make something ordinary look like something exceptional. Hairdressers, make-up artists, and chefs do so habitually to earn a living. And at various times men and women have beautified shells for commercial gain. Giving face lifts to shells lacking in glamour was much commoner in the eighteenth century than it is nowadays but there are still some enterprising souls around who benefit financially from making improvements to the external appearance of shells, although their activities are not widely known. Indeed, so little has been published on conchological cosmeticism that this article may be welcomed by those who enjoy the more esoteric byways of the world of shells.

Robert Gibbings, the travel writer and wood engraver, gives a rare glimpse of a conchological cosmetician in action. When staying with a native family on Mangaia in the Cook Islands he watched while his hostess held an old meat tin containing some small shells over a fire. I'm not sure what kind of shells they were but Gibbings says they could be found on the beach and on rocks inland. He says they all looked alike when collected but after being boiled in soda and exposed to the sun they took on different colours including pink, bronze, yellow and black. Sometimes they would be heated up in a tin without any liquid and this treatment turned them white. The variously tinted shells were then made into hat-bands (1).

Heat treatment or exposure to strong sunlight may have a profound effect on a shell's appearance, particularly on one which has a smooth and polished surface. Both heat and strong sunlight may have been responsible for several of the so-called colour forms, varieties and even species of olive shells and cowries which have been described so prodigally over the years. Olives, in particular, respond to heat in a most conspicuous and attractive way. Almost any specimen, if held in a naked flame, will turn some shade of pink or violet. And many variations of colour and markings may be produced by playing a small flame jet on selected parts of the shell's surface.

Similar effects may be obtained from cowries. It's not necessary to heat the whole shell to obtain the desired variation. Working a hot iron over the surface of a dark-coloured cowry will produce bands or spots of lighter colour, the colour varying in intensity according to the temperature and the length of time the iron is applied. Jacques Guillaume de Favanne was fooled by a specimen of the Lurid Cowry (*Cypraea lurida*) which he catalogued for sale in 1784 (2). He listed the shell as 'la souris tachetée' - the spotted mouse. The Lurid Cowry never has spots but 'la souris tachetée' had several big ones. Probably the spots were ironed on.

Gentle frying in a pan or immersion in hot cinders may transform the colour of a shell drastically. One or other of these methods was used in the eighteenth

century to alter the appearance of a common limpet from the Falkland Islands, Patinigera deaurata. The naturally reddish-brown coloration of this limpet was altered thereby to a brilliant gold. In the 1760s many of these golden limpets were passed off in Paris as examples of a new species. Gullible collectors paid high prices for them (3).

A piece of heated wire may be used to give a spotted or speckled appearance to the outside of a cowry shell. The wire is inserted into the cowry's aperture until the heated end touches the inside of the shell wall. If the wire is hot enough the required mark may be obtained. Another way to give highly polished shells a spotted appearance was discovered accidentally by B. R. Lucas who experimented with mercuric chloride in an attempt to sterilise shells against attacks by mould. Unfortunately he used some of his best shells for his pilot project, including examples of the Pallid Cowry (Cypraea pallida), not one of the easiest cowries to get hold of at any time. Those used for his experiment were dark in colour and free from any markings or spots other than the natural ones. After soaking them in mercuric chloride for twenty-four hours Lucas found that the lustre 'was considerably impaired, and that the shells were marked nearly all over with bright yellow metallic looking spots' (4).

Shells in good condition were not easily come by in eighteenth-century Europe and there was not much variety in the species available then either. Consequently, dozens of 'improvers', working in establishments set up for the purpose at Amsterdam, La Rochelle, and elsewhere, were paid to file chipped edges, scrape and polish worn or corroded areas, to fill in cracks and holes, mould new spines and other structures, to brighten faded colours with paint, and to enliven dull surfaces with varnish. This activity suggests that contemporary shell collections must have been full of doctored shells and that collectors could be easily fooled by purveyors of them (5).

There is a shell in the collection made by Linnaeus, now in the strong-room of the Linnean Society of London, which is the one on which the great naturalist based the description of his Cypraea amethystea. This shell is merely an Arabic Cowry (Cypraea arabica) buffed down so thoroughly that the upper layers of the dorsal surface have been removed so that the underlying violet-coloured layer has been revealed (6). In recent years visitors to Fiji have been similarly duped. They are offered, at an inflated price, a shell known as the 'Tapa Cowry'. It looks unlike any other cowry superficially but anyone can make one for himself by rubbing down a specimen of the Humpback Cowry (Cypraea mauritiana), a very common shell indeed.

Trying to improve or alter a shell's appearance by touching it up with paint or dye is difficult to do convincingly. The colour and colour pattern of most shells is usually just below the surface and in many it is overlaid with enamel so that paint or dye is detected easily. There's a delightful story concerning the gullibility of Dr. William Turton, an early exponent of British conchology. He used to wander the beaches of Devon in search of interesting additions to his collection. One day he came across some brilliantly coloured bivalves unlike any he had seen before. Delightedly he placed them in his cabinet. Subsequently he learnt that his daughters, no strangers to the brush and palette, had passed that way before him. The modern counterpart to this story involves an anonymous collector who is said to have picked up a bivalve shell on an American beach in a locality where it should not have occurred naturally. His elation was tempered somewhat when he turned the shell over and saw scribbled thereon the single word 'Hi!'. Each story, of course, may well be spurious.

The Rose-branch Murex (Chicoreus palmarosae), however, provides another story concerning artificial coloration which is certainly not spurious. This species used to be highly prized in almost any condition but today it is essential that the branches or fronds should be well preserved and of good colour. In Sri

Lanka, the source of most specimens today, some dealers ensure top prices for their Rose-branch Murexes by dipping the fronds into a dye of the appropriate colour, an ingenious if transient deception.

The beauty of many shells, land and freshwater ones especially, is literally only skin deep, the colours and patterns being confined to the thin outer skin, or periostracum, this being easily scraped away with a sharp or rough tool. I have seen a specimen of the common Indian Apple Snail (Pila orbata), said to have been obtained from Bengal about 1910, with false bands of a paler colour than the rest of the shell. Someone had removed the periostracum to produce the banded effect.

Adding artificial bits and pieces to defective shells may improve their appearance and help to sell them. Artifice may even seem excusable, it seems, if the shell concerned is rare and desirable. This is obvious from an entry in the 1876 sale catalogue of the H.C.R. van Lennep collection. A specimen of the Lyre-formed Volute (Lyria lyraeformis) is described therein as 'a fine, large and well coloured example of this excessively rare Voluta, but having the spire artificially mended, so well done, however, as not to be observed without very close examination' (7).

The original, or type specimen of the Japanese Wonder Shell (Thatcheria mirabilis), now in the Natural History Museum in London, has a clearly visible outer lip skilfully modelled in papier maché. George French Angas did not mention this unnatural addition when describing the species on the basis of this shell in 1877, although it is shown distinctly in his accompanying illustration (8).

Bits and pieces are still being added to defective shells. As recently as 1971 a shell dealer at Key West, Florida, was observed making knobs to replace broken ones on specimens of the Lion's Paw Clam (Lyropecten nodosus), a collector's favourite. Once he had carefully moulded and painted the knobs he distributed the transformed Lion's Paws to dealers in the northern states. 'His comment was that he was restoring their beauty, and that he had just as much demand for the specimens' (9).

The total fabrication of a shell, as far as I know, has never been achieved with convincing success although it may very well have been attempted. It has often been said that the Chinese long ago manufactured the Precious Wentletrap (Epitonium scalare) entirely out of rice paper. I am not the only one to have shown a willingness to believe this unlikely tale. Indeed, in my book Rare Shells I implied that I had seen one belonging to a London shell dealer. I said of the specimen, 'It would deceive an expert, for apart from its lighter weight and duller surface-texture there is nothing to suggest forgery; and successive owners have detached tiny pieces to see if they dissolved in water - and they did' (10). That was written fifteen years ago. The former owner of the specimen has since died and I have had a second, closer look at the specimen. There is, indeed nothing to suggest forgery. The specimen is a large, somewhat damaged but otherwise unremarkable, Precious Wentletrap. I had been too willing to see something exceptional in something ordinary. It happens to most of us, sooner or later.

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- (1) Over the Reefs, 1948.
- (2) Catalogue Systématique et Raisonné etc. Paris, 1784. This was a catalogue of the Comte de la Tour d'Auvergne's collection; 'la souris tachetée' was lot 313, bought for 16 francs by C.H. Hwass, the authority on Conus. He should have known better.
- (3) S.P. Dance, Shell Collecting: an Illustrated History, 1966, p.81.

- (4) Journal of Conchology, vol.11, p.365 (1906).
- (5) Dance, loc.cit.
- (6) The shell of 'Cypraea amethystea' is illustrated, in colour, in: S.P. Dance, Animal Fakes and Frauds, Maidenhead, 1976. There is a brief coverage of faked shells in this book.
- (7) G.B. Sowerby (3rd.), The celebrated Collection of Shells Formed by Mr. H.C. Roeters van Lennep, 1876, p.53 (lot 670).
- (8) The specimen is illustrated, in colour, in: S.P. Dance, Rare Shells, 1969.
- (9) Texas Conchologist, October 1971.
- (10) Dance, Rare Shells, London, 1969, p.87.

S. Peter Dance

A WEEK'S SNAIL COLLECTING IN IRELAND

This was really a holiday in which our main purpose was to see the flowers of the limestone uplands of the Burren, County Clare and a great deal of the time was spent in photographing flowers, studying the mosses, butterflies and birds. We also hoped to learn something of the present status of the rare land snails Vertigo angustior, Vertigo geyeri and Catinella arenaria in Ireland and on the way home we were to visit and record the Mollusca in six, up to now, unrecorded 10 km. squares in County Carlow.

DAY 1. Friday 17th. June 1983. We set off from Leeds Station at about 3.30 p.m. and made pretty good time in spite of the fact that one of the rear tyres had a slow puncture and we had to keep stopping to pump it up. We stopped when we reached Bethesda in the Snowdonia National Park where we found bed and breakfast convenient for visiting both the Llyn Ogwen region and for Anglesey and the Holyhead Ferry which we were to board at 2.00 p.m. the next day. That evening we had a pleasant walk round Llyn Idwal until sunset where we found the starry saxifrage and plenty of interesting mosses but we did not look for any snails. The weather had been fine during our drive from Leeds and was to remain so, though sometimes overcast, for the whole holiday.

DAY 2. Saturday 18th. June. We stopped at a few ivy-covered walls that looked likely places for Vertigo alpestris on the way to Bangor but did not find anything of particular note so we made our way to Newborough Warren on the S.W. corner of Anglesey. Newborough Warren is an extensive area of sand dunes much of which is a pine plantation but there are a lot of flowers to be seen in the more open area which included the rare round-leaved wintergreen Pyrola rotundifolia, sub species maritima. The area was very dry and no interesting snails were spotted. At Holyhead we went to the Welsh Tourist Information Centre and booked bed and breakfast in Fishguard where we would arrive the next Saturday morning after 1.00 a.m. After lunch we boarded the ferry and arrived at Dun Laoghaire at about 6.30 p.m. where we went to the Irish Tourist Information Centre which was fortunately still open and booked bed and breakfast in Laytown, Co. Meath, handy for the sites which we wished to visit the next day, then drove north through Dublin to our digs. That evening we walked along the Laytown beach, making a list of what few snails we saw, to Bettystown where we visited the 'Pub' before going home to bed.

DAY 3. Sunday 19th. June. We spent the morning looking at sites for the local snails Succinea oblonga and Semilimax pyrenaicus. The first of these was at Old Bridge near Drogheda where we found Succinea oblonga on the south side of the River Boyne at the east end of the bridge. The snails were common in a damp shallow ditch shaded by tall grasses, weeds, nettles and willow trees where the mud was covered with a layer of green algae. We then moved on to Mellifont Abbey which I thought from my map was another site for Succinea oblonga. However we

did not find any obvious place to look for the snail that was easy to approach and when we got home we found it was in fact a site for Semilimax pyrenaicus. We went on to Collon on the road junction less than 2 kilometres north of the town which goes to Dunleer and there, in the moss in the lower-lying parts of a mixed pine plantation we found Semilimax pyrenaicus as Adrian Norris had described. It was a hot sunny day and we made our way across the middle of Ireland hardly stopping until we arrived at Mullingar. We looked in the canal for Myxas glutinosa. Myxas lives in clean, hard water but the water here was dirty and polluted not at all as it had been described to us. We could not find the locks where the snail had been seen before and the locals did not seem to know of their existence so it seems that this part of the canal is no longer suitable. We then continued on our way west and it was late in the evening that we arrived at Ballinasloe where we stopped at the first 'bed and breakfast' we saw. They were already full up but recommended us to another which, quite by chance, turned out to be between Pollboy Bog and Cloonascragh Bog, two old sites for Vertigo geyeri which we had intended to visit. After dinner there was plenty of daylight left and we spent a long time trying to find a site suitable for Vertigo geyeri in what we imagined was Cloonascragh Bog. What we found was an acid, heather-covered moor with extensive peat diggings. Although some of these wet places had Schoenus nignicans and other plants associated with Vertigo geyeri none were basic enough for this snail. Not only had this area been extensively drained but the eskers were also being exploited for their stone.

DAY 4. Monday 20th. June. We made good time to Galway where we spent some time in the Information Centre, booking our future 'bed and breaks', writing postcards and buying provisions, so that by the time we had negotiated a road repair gang on the way to Oughterard it was after mid-day. I (Barry Colville) think that this booking in advance was a mistake, as at this time of the year there seems to be plenty of room. It is better to stop when you find a suitable location and to spend your time snailing rather than in an Information Centre. Our first stop was just after Oughterard where we noticed some flowers by the road. We were going through a bit of acid moorland but the road had plainly been banked up with limestone which produced a favourable habitat for a profusion of different flowers and we made a list of snails. We then approached the areas from Maam Cross and beyond from where Jeffreys, Phillips and Stelfox had described finding Vertigo lilljeborgi. We stopped from time to time to try to find places that might be suitable for this snail, but there certainly weren't any sites that resembled those of the Lake District where the snail occurs and I do not think that we even saw the un-named small lake 1 mile S.W. of Ballynahinch lake, near Roundstone, which is the classical site. We went on through Roundstone to Dog's Bay where there was a nice marshy spot below the car park. Here I cut some of the vegetation and amongst the snails we sieved out of it were two Vertigo angustior. From the same place we found Vertigo antivertigo, Vertigo substriata and Vertigo pygmaea. From what we later found out, it is possible that the main colony of Vertigo angustior which was what we were searching for, was in the sward facing S.W. near the sea in a much drier area. We then made our way to Maam Cross where we had our evening meal and asked our way to our lodgings to find that they were 6 miles north at Maam. To get there we crossed over a pass in the Maamturk mountains where we had a wonderful view of the mountains of Joyce Country and so entered the valley of Joyce's river which shortly joins an arm from Loch Corrib; a pleasant place to spend the night.

DAY 5. Tuesday 21st. June. We got up early and went to another location for Vertigo lilljeborgi mentioned by Stelfox; on Lough Inagh, and came to a derelict building where the road was near a bay of the Loch which had a shelving beach. Here was a floodline with flotsam and amongst it some round stones on the grass. On turning these I found a few Vertigos. This could have been the classic situation for Vertigo lilljeborgi in Ireland and we were very excited, but when we got back to base they looked as though they were all Vertigo antivertigo and indeed from a bag of grass and sedge taken from the area, they all turned out to be

Vertigo antivertigo except for two Columella aspera, so we shall have to go back to have another look for Vertigo lilljeborgi in Ireland. After breakfast we made our way to the south side of Galway Bay to the Burren. Our first stop in the Burren was at Ballyconry near Ballyvaghan. Here there was an area of well developed hazel scrub and we found Acanthinula aculeata in the leaf litter and also a large number of ticks some of which I saw streaking up my arm. I was horrified when I got home that evening to find large numbers well and truly attached! While I was quietly sitting I heard some strange grunting noises coming from the undergrowth and after a while two pine martens ambled across the road barely ten yards away. The grunting continued and I am sure it came from them. I had never before realised that these shy creatures could talk to one another. The plants of the area were of course an attraction and I was photographing these. In particular profusion was the Burnet rose but the butterflies were also a cause of digression, in particular the Wood White and the small blue were common. We then went on to Black Head on the N.W. tip of the Burren where in little caves in the cliff, maidenhair fern was growing. Just round the headland where the road runs about half a mile from the sea we walked across the limestone pavement to the sea, past many interesting plants including the Irish saxifrage and a profusion of Bloody Cranesbill. We came to a grassy sward across which there was a thin line of flotsam indicating an extremely high tide line reached only in stormy conditions. At that point under a large wooden board there were several Vertigo angustior. We also got very excited when we found some little creamy white slugs with a clear slime that were extremely active, but this was to turn out to be another of our disappointments as they were all Derocerus reticulatum and not, as we had hoped, a new record for Ireland - Derocerus agreste. We then went on to find that in the close, dry, short grass of the sward at the level just above the roots, Vertigo angustior could be found at about one to the square inch. Searching grassy areas nearby within reach of the spray showed that Vertigo angustior was there also. We continued to Lisdoonvarna where, after dinner, we found that the accommodation booked from Galway, was a very small room, good practice for living on a boat, but we managed quite well, getting a bit of sieving done.

DAY 6. Wednesday 22nd. June. The day's travelling was to be a circular tour N.W. of the coast, then north, and then back across the heart of the Burren. The first stop was Poulsallagh a particularly good place for flowers. The Spring Gentians and the Hoary Rock-roses were over but we found seed heads of both in profusion. We were in square M/00, one of the 10 km. squares from which Vertigo angustior was not known and we looked for the snails in the grassy areas near the sea and there, where it occurred, quite easy to find, especially under stones where it could be seen in the grass roots. We then moved north to an area of sand dunes at Fanore, square M/10, and in a bag of moss taken from a south-facing dune we found three more Vertigo angustior. This, with square M/11 (The Blackhead square), were three new 10 kilometre square records for Vertigo angustior. We turned east along the Khiber Pass, where the River Caher runs, and on the steep north-facing hill there was a profusion of Mountain avens, Dryas octopetalia, some with eight petals, some with sixteen and some with more. We went further up the valley towards Caherbannagh, another good area for plants, and there was a spring turning the moss to tufa and a couple of handfuls of this revealed both Vertigo antivertigo and Vertigo pygmaea, the large dark brown form associated with marshes. We then went on a little further and came to a hazel copse which cattle frequented. This was thought to be near the place where Vertigo pusilla has been found, and I went into the copse to sieve some of the leaf litter. I had not taken sufficient heed of the experience from my previous excursion into such a kind of countryside. I thought that I had been bitten by a lot of ticks on the previous day, but this time I had at least ten times as many and by now was getting allergic reactions to the bites which were coming out in large wheals. To add insult to injury there were no snails at all in the sievings. We then climbed Corkscrew Hill - a place for plants - but did not find the best places. Later on we came to a field where the grykes in the limestone were hidden in the vegetation making walking extremely hazardous. Here we found one of the saxifrages in profusion. The road south went

on to Kilfenora and the Burren Centre where they showed a 20 minute film on the Burren. As the charge was £2 we did not look but bought some literature instead. And so back to Lisdoonvarna.

DAY 7. Thursday 23rd. June. A really lovely day with brilliant sunshine, fleecy white clouds and no haze, so that when we went along the road towards Poulsallagh we were able to see clearly the mountains, the other side of Galway Bay and the Aran Islands. These were all duly photographed before we made our way to the lakes in the N.E. side of the Burren. These were marvellous places for flowers especially orchids, in particular, the fly orchid Ophrys insectifera, the lesser butterfly-orchid Plantanthera bifolia and for an area of shrubby cinquefoil Potentilla fruticosa, some of which was already in full flower. In the afternoon we started on our journey across Ireland to Rosslare and on the way we were to investigate some reported sites for Vertigo geyeri. The first stop was Fiagh Bog where the species was found by Adrian Norris in 1970. We asked of the owner where the best bog was but he replied that he had drained it, all but a small portion some years ago. Indeed only a small area of former bog remained with exposed whitish areas where there were dead shells of water snails; deep drains had been dug nearby. Vertigo antivertigo could be found with difficulty and there were also a few dead shells of Vertigo moulinsiana but no signs of Vertigo geyeri. However the prospect was not entirely bad as the marsh fritillary occurred here. We moved to the site at Roscrea, County Offaly, described by Norris as perhaps the safest of the known habitats. We went to the most low-lying area where we found a sick donkey surrounded by a few tufts of Juncus effusus amongst grassland. On the way back to the car we spoke to a gentleman with a bungalow by the road who told us that since the water table had been lowered 4' by drainage his house had not flooded in the winter! This explained why this was no longer a suitable site for Vertigo geyeri. Though the drainage had only been undertaken 3 years previously it looked as though the site had never been anything but a grassy field. We then visited an area that Brian Coles knew of, 6 kilometres south south east of Birr, County Offaly, opposite a church and by a stream where there was an undrained fen bog which had many of the plants characteristic of the English site for Vertigo geyeri on Tarn Moor, Cumbria, namely bog bean, Menyanthes trifoliata, Carex demissa and with tufaceous deposits. Here at last we found Vertigo geyeri and also Catinella arenaria. It was late but we chose a route back to our place in Roscrea which took us past another marshy spot at the north east side of a T junction 8 kilometres east of S.E. of Birr on the south east side of the road. Here also there were tufaceous deposits where Catinella arenaria was particularly abundant. Vertigo geyeri and Vertigo moulinsiana were also there but in fewer numbers.

DAY 8. Friday 24th. June. We got up early the next day and took some moss and herbage from this site before we continued our journey across the plain of Ireland. We took a little detour on the journey home into County Carlow where we visited squares S/76, 75, 85, 86, 84 and 83 which were previously unrecorded. We got a total of forty one species from these 10 kilometre squares, the most notable being Acicula fusca. We then left Ireland from Rosslare.

DAY 9. Saturday 25th. June. We arrived after 1.00 a.m. at our digs in Fishguard and set off for the Gower to look at two more sites for Vertigo angustior. Close to the type locality of Jeffreys and discovered by Martin Willing and Richard Preece recently. We were unable to find it at Oxwich but found it in profusion in the transition area between the salt marsh to the east, and the sand dunes to the west of Whitford Burrows. We think it therefore worth looking carefully at the roots of grass just above the high tide mark and in such other areas on sand dunes where there are transition areas in other parts of the Country especially in Scotland and at North Somercoates in Lincolnshire where it had been suggested that it may be a fossil record, for in truth we do not think we had previously been looking in their true habitats.

Though we have added two new sites for Vertigo geyeri to the Paper by Norris and Pickrell, we have to report that they can no longer be found at the three sites they described finding specimens. The sites that we found may therefore be among the last in Ireland. They could very easily be drained in the future. We wonder if the Irish have anything like our National Trust or have National Nature Reserves. If so we really feel they ought to do something about the area near Birr.

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B. Colville and B. Coles

ACHATINA LACTEA REEVE FOUND ALIVE IN SOMALIA

Numerous shells of Achatina lactea, described in 1842 by Lovell Reeve, have been collected in Somaliland during the past 30 years mostly by C.F. Hemming and J. Williams (Pain, 1954, 1956; Verdcourt, 1956, 1960). No living specimens were ever found and it was even suggested it was extinct although Bequaert (1950) speaks of specimens evidently collected alive and so does Pain (1954). Shells were collected in Somalia in June 1983 by Hemming and believing that the shells were too fresh and too numerous to support the idea of extinction he left instructions for an intense search to be made for live specimens and this proved to be successful. On the 14th. July 1983, C.E. Hayslip collected 8 live specimens at the fork 29 km. N. along road running along the east side of the Webi Shabeeli at beginning of tarmac just before Balcad, at 2°33'15" N, 45°30'50" E. The area is one of dense bushland with scattered Acacia tortilis and one Adansonia digitata 10 m. tall on alluvial sand. Three snails were found in the afternoon under bushes 3 m. tall in heavy litter, partially buried into the sand beneath the litter; 5 were found actively foraging after dusk and in the early morning up to 1½ hours after sunrise. Two of the snails had been put into spirit unexpanded and 6 were delivered to me by Mr. Hemming alive with thin epiphragms in position or only recently detached. One of these has been drowned outstretched so that its anatomy can be examined by Professor A. Mead who has made a detailed study of the anatomy of the genus and its allies and the other 5 will be kept alive if possible. The beasts are quite heavy, the 6 weighing 1 lb. 3.5 oz., i.e. an average of 92 gm. each. The upper part of the animal, head and neck are pale grey-brown as also is the sole but the very corrugated flatter sides are almost black. The present distribution is restricted to the lower half of southern part of the Somali Republic from Obbia to Gumbo from the coast inland for about 300 km. It is also known as a Pliocene fossil from much the same range on the coast and was reported as a post-Pliocene fossil from Mombasa by Cox although Bequaert doubted this identification. Through the kindness of Dr. W.D. Ian Rolfe of the Hunterian Museum, Glasgow University I have been able to examine Cox's original material and find it is in the lineage of Achatina albopicta Smith and I would say inseparable from it; a species still common in the area in coastal forest and not adapted to arid areas. Piersanti's record of the species (as A. fulica) from the mouth of the R. Omo at the north end of Lake Rudolf in S. Ethiopia is far removed from the proved area of distribution but his figure shows, as Bequaert points out, a shell which is undoubtedly A. lactea. This collection has been destroyed and possibly it was based on a subfossil shell; if not the area of distribution is very much extended.

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B. Verdcourt, C.F. Hemming & C.E. Hayslip

THE NON-MARINE MOLLUSCA OF THE ISLE OF MAY, FIFE, SCOTLAND

Apart from an annotated list in Eggeling (1960), no single account has brought together the reports of the non-marine Mollusca found on the Isle of May. The island which has operated as a Bird Observatory since 1934 has attracted naturalists other than ornithologists amongst whom have been a few conchologists.

This article attempts to provide an historical account of the visits of those conchologists and a systematic account of the species found. The discussion suggests possible origins of the molluscs.

Historical

J.A. Harvie-Brown (1887) the ornithologist, was the first to mention a mollusc on the island. During his visits in 1880 and 1884 he found Helix aspersa (Müller 1774) but he was unable to find any other species.

A considerable gap follows, and Vernon D. Van Someren visited the island on 30-31 March 1935 and collected four species. Two visits by biologists in 1958 resulted in some mollusc records. A Glasgow University party on the island from 20-27 June studied the aquatic invertebrates (Maitland, 1967) and T. Huxley of the then Nature Conservancy recorded seven species between 15-18 September (Eggeling, 1960). June 1972 saw a party of students from University College Cardiff on the island, studying various invertebrate populations (Bellamy, 1972).

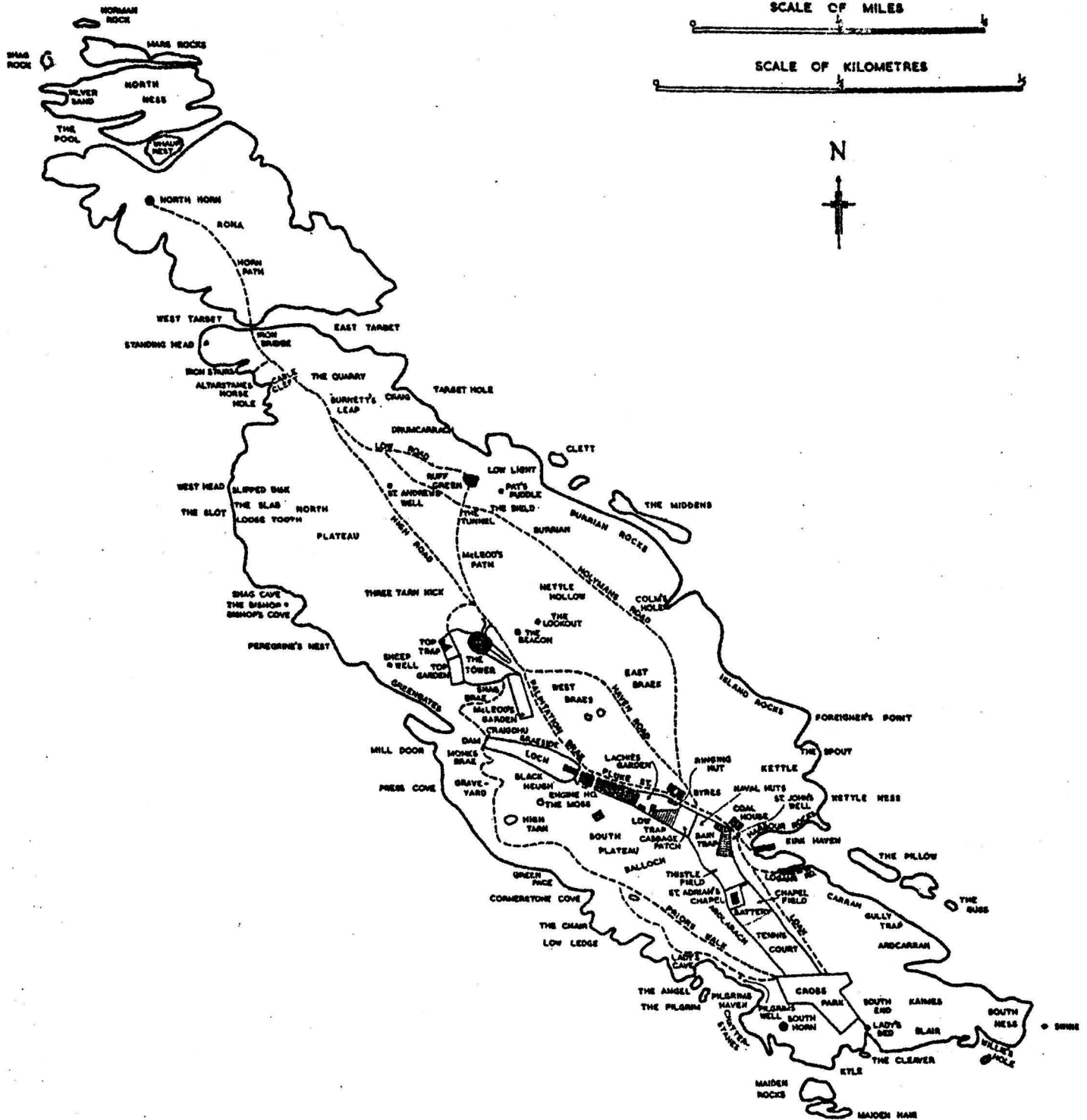
The author has since made two visits to the island when snails were collected. These were on 12-19 July 1980 and 2-3 July 1983.

Systematic List

Potamopyrgus jenkinsi (E.A. Smith 1889)

First found by the author in the polluted Mill Dam and the West Braes Pool in 1980. It was common and numerous in both but was not found in any other water bodies including the wells despite exhaustive searches. The discovery is not at all unexpected in the light of this snail's colonising history.

ISLE OF MAY



Lymnaea truncatula (Müller 1774)

Both 1958 surveys found the Dwarf Pond Snail in one spring, Pat's Puddle. This was excavated in the late 1930's by Patrick Sandeman of the Inverleith Field Club and no records of this snail were made previously or since. Callan (1936) made a complete study of the invertebrate life and found no molluscs, and I was not able to find this snail in 1980 or 1983.

Cochlicopa lubrica (Müller 1774)

This snail is first listed by T. Huxley in 1958 and I found it common in both years about the Chapel, Cross Park and the North Plateau. A few specimens were found on the east side of the island.

Lauria cylindracea (Da Costa 1778)

Roebuck (1894) records some very stunted examples during August 1893. It was not recorded again until 1980, but I would not consider the specimens any different to those found elsewhere in east Scotland. I found this snail common everywhere in both years.

Vallonia pulchella (Müller 1774)

Recorded in the 1976 'Atlas', presumably by the Cardiff team in 1972. I found this an uncommon snail in both 1980 and 1983, only discovering it about the Chapel.

Vallonia excentrica Sterki 1882

Also recorded in the Atlas of 1976, again presumably by University College, Cardiff in 1972. I did not use mechanical sorting techniques in 1980 or 1983 and did not record any examples of this snail.

Discus rotundatus (Müller 1774)

First found in 1935 by Van Someren and surprisingly not again until 1980. I recorded this snail as being common everywhere in both years.

Arion ater (Linné 1758)

Listed originally by Huxley in 1958, and not mentioned again until my 1980 survey. This slug is ubiquitous and I vividly remember finding it annually between 1970-79 whilst birdwatching.

Arion intermedius Normand 1852

Not discovered until 1980. I found it fairly common about the Chapel, Cross Park, North Plateau, the Burrian and the east side of the island in 1980 and 1983.

Vitrina pellucida (Müller 1774)

Van Someren's record in 1935 is the first. Young slugs were common by the South Horn, the Chapel and Cross Park in 1980, but I failed to find a single live specimen in 1983.

Vitrea crystallina (Müller 1774)

Huxley in 1958 is the first to mention this snail. In both 1980 and 1983 this was an uncommon find by the Chapel and Cross Park only.

Oxychilus cellarius (Müller 1774)

Recorded in the 1976 Atlas, again presumably by the 1972 Cardiff expedition. Only a few specimens were found by me in 1980 and 1983 by the Chapel.

Oxychilus alliarius (Miller 1822)

In 1935 Van Someren found this zonitoid. It is not discovered again until 1980 and 1983 when I thought it ubiquitous.

Milax gagates (Draparnaud 1801)

Huxley's 1958 list is the first mention of this slug. In 1980 and 1983 it was uncommon, being found only about the Chapel and the Sheep Well.

Limax marginatus Müller 1774

Two young slugs of this species were found on a wall by the High Road in 1983. There are no previous records.

Deroceras reticulatum (Müller 1774)

Collected first by Van Someren in 1935 and not again until my two visits. This slug I found to be common everywhere.

Clausilia bidentata (Strom 1765)

'Very stunted forms' were collected in August 1893 (Roebuck 1894) but no examples of this species have been found since.

Cepaea nemoralis (Linné 1758)

Taylor's monograph (1894-1921) credits Harvie-Brown with the discovery of this species var. minor on the Isle of May although Harvie-Brown makes no mention of it in his paper (1887). No further records of this snail have come to light.

Helix aspersa Müller 1774

Harvie-Brown (1887) could find no other land or freshwater mollusc between 1879-84. This is the only snail to be mentioned in the daily log of the Bird Observatory (20 May 1950 onwards). Maitland (1967) thought it common in 1958 and in my experience between 1970-1983 I consider it ubiquitous and in places extremely abundant. Eluned Morgan of the Cardiff party in 1972 found three definite morphs present in high densities in Hogweed Heracleum sphondylium Linné 1758 and Stinging Nettle Urtica dioica Linné 1758 associations over the island.

Pisidium personatum (Malm 1855)

Recorded by Huxley in September 1958. This species was not found during Glasgow University's thorough survey of aquatic invertebrates in June 1958. However, Pat's Puddle, a man-made pool which rarely dries had a healthy population of this species in 1980.

Pisidium obtusale (Lamarck 1818)

Again, recorded by Huxley in September 1958 though not by Maitland.

Pisidium casertanum (Poli 1791)

The only freshwater bivalve found by Maitland (1967) in 1958, only in Pat's

Puddle. This man-made pool rarely completely dries and still had a healthy population of this species in 1980.

Discussion

It is well known that freshwater Mollusca can be transported by wildfowl (Boycott, 1936) and the island regularly has several species of ducks which visit all the water bodies present. Few of these are permanent, however, the tarns in particular drying up during the summer months. All five wells hold water but these are not visited by wildfowl and no freshwater molluscs have been recorded in them. I searched these intensively in 1980 and 1983.

The only permanent freshwater is the Mill Dam and due to sea-spray and pollution from the Lighthouse engine house, it is not particularly attractive to molluscs. Potamopyrgus jenkinsi (E. A. Smith 1899) can live in brackish water and is likely to remain there. Lymnaea truncatula (Müller 1774) is likely to be an occasional coloniser which becomes extinct when pools dry up. It is interesting to note that the other host of the Liver Fluke, sheep, were grazed on the island until 1960.

Transportation by birds is also recorded for terrestrial species. Williamson et al (1959) record instances of the slug Vitrina pellucida (Müller 1774) being carried by several species of migratory land birds. While this may be the reason for the existence of some species on the Isle of May, renowned for its migratory birds, I consider that the main cause is accidental introduction by man.

Some species were likely to be introduced by the monks at the Priory who resided on the island from the 1140's until 1730 (Eggeling, 1960). The building of the Beacon in 1636 and subsequent lighthouses brought lighthouse keepers and their families. Most maintained gardens with vegetables and other plants and some introduced soil and still do to this day. Helix aspersa (Müller 1774) and Deroceras reticulatum (Müller 1774) are well known garden pests and are quite likely to have been introduced in this way.

The activities of the Bird Observatory since 1934, especially the numerous trees and shrubs planted in the Heligoland traps are likely to be another source of introductions. Further planting in the future will undoubtedly provide new species for the island list, but it is unlikely that this will have any significant effect on the ecology of the May. However, the populous garden snail provides a valuable food supply for migratory and occasionally breeding Song Thrushes Turdus philomelos (Brehm). During December visits between 1972-74 I frequently observed Oystercatchers Haematopus ostralegus Neumann and Curlews Numenius arquata (Linne 1758) extracting these snails from walls in which they were hibernating.

Acknowledgements

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Norman K. Atkinson, 19th. November 1983
Museum and Art Gallery, Panmure Place, Montrose, Angus, Scotland, DD10 8HE

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SHELL CONTENT OF RECENT SHALLOW MARINE SAND AT MOLUNAT, YUGOSLAVIA

Abstract: The shell content of the Recent shallow marine sand at Molunat in Yugoslavia is diverse but dominated by lucinacean bivalves (especially Loripes lacteus), with limpet gastropods, other heterodont bivalves and a nukulacean also common. The diversity is a result of the contribution of shell material to the sediment from different communities mainly within the two locally observed habitats; sand with patches of sea-grass, and rock surfaces.

INTRODUCTION AND LOCALITY DETAILS

The collection of shells discussed here was obtained by digging and sieving the sand at Molunat in southern Yugoslavia (36km south-east of Dubrovnik). At this locality a shallow flat-bottomed bay with an average depth of about 8m shelves gradually towards the shore. The bottom of the bay is mainly of sand which drowns a karst topography. Outcrops of limestone and subangular boulders of limestone occur, also patches of sea-grass, so that in the bay three main habitats can be recognised, namely; rock surface, sea-grass patches, and mobile sand bottom. The individual faunas of the last two could not be distinguished in the shell collection from the sand.

The area sampled was 25m from the shore in mean water depth of 1.20m (maximum tidal range 0.6m). Bottom currents are insignificant but the sand is periodically

affected by wave action which creates symmetrical ripples. An area of about six square metres was dug to a depth of 10cm, and most shells above 3mm were retained by the makeshift sieve.

The sand is fine-grained and crudely laminated with varying content of carbonaceous matter (mainly fragments of sea-grass) so that it provides a firm bottom, with the exception of the top 5cm which are patchily excavated by fish and holothurians. The sand contains a high proportion of skeletal debris, including angular fragments of shells, small molluscs, foraminifers, sponge spicules and echinoid spines.

TAXONOMIC COMPOSITION AND ECOLOGY

The shells were identified using the monographs by d'Angelo and Gargiullo (1978) and Parenzan (1970-74), who also give information on distribution and habitat. A complete systematic list is given in Table 1, including the numbers of conjoined valves and separated left and right valves if appropriate. For each species the number of specimens as percentage of the total (using minimum number of individuals) is given, and for the more common species also the probable habitat derivation. 10.8% of the bivalves and 4.6% of the gastropods have been drilled by a predatory gastropod, and a few of the gastropod shells contain the remains of a hermit crab.

There are two particularly striking aspects of the taxonomic composition of the collection, 1) the diversity and 2) the dominance of one species. Considering the small size of the sample and the restricted area of sampling there is a relatively high diversity with more than fifty species identified, of which ten are represented by single specimens. Bivalve molluscs are dominant, with gastropods also well represented. Other groups are rare. The collection is dominated by the lucinacean bivalve Loripes lacteus (Linn.) which makes up nearly half of the specimens recovered, and other lucinaceans Ctena decussata (Costa) and Lucinella divaricata (Linn.) are also common. Other bivalves which figure prominently include Acanthocardia echinata (Linn.), Glans trapezia Linn. and Tellina pulchella Lamarck, while the protobranch Nucula sulcata Bronn was the fourth most common bivalve. Among gastropods Patella subplana Pot. and Mich. and Diodora gibberula (Lamarck) are the most abundant, followed by a small high-spined cerithiid Bittium latreillei (Payr.).

The ecology of the various species is summarised, partly in diagrammatic form, by d'Angelo and Gargiullo (1978). Two main modes of life are represented; infaunal, mainly shallow, burrowers in a sandy substrate (such as Loripes lacteus), and epifauna attached to rock surfaces (such as Patella subplana). This can be used to determine which of the two main habitats recognised in the bay (sandy substrate plus patches of sea-grass, and rock surfaces) various species were derived from, see Table 1. There is slight doubt about the habitat of the small gastropod Bittium latreillei which can also be epifaunal on sea-grass according to Brasier (1975).

DISCUSSION

The shell content of the shallow bay sand at Molunat is diverse, though dominated by the lucinacean bivalve Loripes lacteus, and includes representatives of two separate but neighbouring ecological communities; those associated with rock surfaces, and those with sand plus sea-grass patches. Rare representatives of other habitats are also present.

Several macrofaunal elements observed to be common in the area are missing from the shell collection from the sand, including holothurians, fish, sea-urchins and sponges. Large molluscs observed but not represented in the sand include some thick-shelled Spondylus gaederopus, large Pinna nobilis, trochids and larger

TABLE 1: SYSTEMATIC LIST

	NUMBER OF SPECIMENS			HABITAT DERIVATION	
	conj.	l.v.	r.v.	% age of total	Sandy substrate Rock surface
BIVALVIA					
Nuculoida -					
<u>Nucula (Nucula) sulcata</u> Bronn		24	14	3.1	X
Arcoida -					
<u>Barbatia (Barbatia) barbata</u> (Linn.)		14	8	1.8	X
<u>Arca (Arca) noae</u> (Linn.)		1	4	0.5	
<u>Striarca lactea</u> (Linn.)		12	11	1.6	X
Mytiloida -					
<u>Mytilaster lineatus</u> (Gmelin)		14	6	1.8	X
<u>Mytilus galloprovincialis</u> Lam.		1	1	0.1	
<u>Gregariella barbatella</u> (Cantr.)	1	4	5	0.8	
Pterioida -					
<u>Chlamys (Chlamys) varia</u> (Linn.)		1 frag.		0.1	
<u>Lima lima</u> (Linn.)		2	2	0.3	
<u>Limea loscombei</u> (Sowerby)		2	1	0.3	
<u>Anomia ephippium</u> Linn.		12		1.6	X
Heterodonta-Lucinaceae -					
<u>Loripes lacteus</u> (Linn.)	21	265	300	41.7	X
<u>Ctena (Ctena) decussata</u> (Costa)		31	20	4.0	X
<u>Lucinella divaricata</u> (Linn.)		15	9	2.0	X
Chamaceae -					
<u>Chama (Chama) gryphoides</u> (Linn.)			5	0.7	
Leptonaceae -					
? leptonacean, undetermined		3	7	0.9	
Mactraceae -					
<u>Mactra (Mactra) corallina</u> (Linn.)		4	2	0.5	
<u>Donacilla cornea</u> (Poli)		1	3	0.4	
Tellinaceae -					
<u>Abra alba</u> (Wood)		5	6	0.8	
<u>Tellina pulchella</u> Lamarck		15	12	2.0	X
<u>Donax venustus</u> Poli		9	7	1.2	X
<u>Fabulina fabuloides</u> Monterosato		7	4	0.9	
? <u>Acropagia crassa</u> (Pennant)		1		0.1	
<u>Gastrana fragilis</u> (Linn.)		1		0.1	

NUMBER OF SPECIMENS

HABITAT DERIVATION

	<u>conj.</u>	<u>l.v.</u>	<u>r.v.</u>	<u>% age of total</u>	<u>Sandy substrate</u>	<u>Rock surface</u>
Carditaceae -						
<u>Glans (Glans) trapezia</u> (Linn.)		18	18	2.3	X	
<u>Venericardia (V.) antiquata</u> (Linn.)		5	2	0.7		
Cardiaceae -						
<u>Acanthocardia (A.) echinata</u> (Linn.)		35	30	4.6	X	
Veneraceae -						
<u>Venus (Venus) verrucosa</u> Linn.		7	9	1.2	X	
<u>Venerupis (V.) pullastra</u> (Montagu)	1	5	10	1.4	X	
<u>Dosinia (Dosinia) lupinus</u> (Linn.)		6	3	0.8		
<u>Irus (Irus) irus</u> (Linn.)			1	0.1		
venerid, undetermined			3	0.4		
<u>Chamelea gallina</u> (Linn.)			1	0.1		
GASTROPODA						
Patellaceae -						
<u>Patella caerulea subplana</u> Pot. & Mich.		48		6.2		X
? <u>Acmaea unicolor</u> Forb.		1		0.1		
? <u>Propilidium ancyloides</u> Forb.		1		0.1		
Pleurotomariaceae -						
<u>Haliotis lamellosa</u> (Lamarck)		2		0.3		
<u>Emarginula reticulata</u> (Risso)		4		0.5		
<u>Diodora gibberula</u> (Lamarck)		36		4.7		X
Trochaceae -						
<u>Tricolia speciosa</u> (Muhlfeld)		1		0.1		
<u>Gibbula</u> sp., prob. <u>albida</u> Monterosato		2		0.3		
<u>Callistoma</u> sp., prob. <u>granulatum</u> (Born)		3		0.4		
Rissoaceae -						
<u>Alvania</u> sp.		1		0.1		
Cerithiaceae -						
<u>Cerithium</u> sp.		9		1.2		
<u>Bittium reticulatum latreillei</u> (Payr.)		28		3.6		X
Calyptraceae -						
<u>Crepidula unguiformis</u> Lamarck		2		0.3		
Muricaceae -						
<u>Ocenebrina aciculata corallinoides</u> (Mont.)		3		0.4		

NUMBER OF SPECIMENS

HABITAT DERIVATION

	<u>conj.</u>	<u>l.v.</u>	<u>r.v.</u>	<u>% age of total</u>	<u>Sandy substrate</u>	<u>Rock surface</u>
Buccinaceae -						
<u>Hinia</u> sp., prob. <u>costulata</u> (Ren.)		7		0.9		
Conaceae -						
<u>Conus mediterraneus</u> Brug.		3		0.4		
CRUSTACEA						
crustacean fragments, undetermined		74		0.5		
POLYCHAETA						
polychaete tubes		4		0.5		
ECHINOIDEA						
echinoid fragments		71		0.1		
VARIOUS						
undetermined fragments		3		0.4		
TOTALS: specimens		1210				
min. no. of individuals		769				

conj. = conjoined valves
l.v. = left valve
r.v. = right valve

cerithiids.

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Nicol Morton

DREDGING IN WEYMOUTH BAY AND PORTLAND HARBOUR, DORSET, NOVEMBER 12th. 1983 ①

During November 1983 eight members of the Society took part in a dredging trip off Weymouth Bay and within Portland Harbour. The enterprise was something of an experiment since the boatman had not taken a party of conchologists out before. We gathered on Weymouth Quay for a 9 a.m. departure. (Some of us had been up since 5.45 a.m. having made the journey down from Surrey to Dorset!)

The morning itself was slightly misty and not unduly cold; in fact, the preceding week had been exceptionally mild and we counted ourselves fortunate to be undertaking such a trip so late in the year.

Our vessel was a real working boat, standing room only amidst the machinery, winches, etc.. We chugged out into the Bay and encountered a chill in the air and a distinct swell which rocked the boat quite sharply at times. Luckily there were no casualties to seasickness.

We were to use a wire mesh dredge (about 2½"). Our first haul lasted some thirty minutes and brought up a large Dover Sole which the writer shared with her spouse for supper, and a number of rocks and some pieces of solid clay containing boring molluscs; in one piece we found several specimens of Barnea parva and one each of Barnea candida and Sphenia binghami. Conspicuous in this and every one of our eight hauls were Crepidula fornicata!

The second haul was a disappointment; after a half-hour's trawl we pulled in a mangled dredge with a gaping hole in the bottom. We had obviously met some obstruction on the way. Undeterred our cheery fisherman repaired the damage. In an effort to bring up some finer material we tied a bucket to the dredge for the third and fourth hauls but this proved ineffective.

We had covered various types of 'bottom' by this time and explained to the boatman that we wished to bring up finer material in the form of sediment. A large sack was produced. It fitted neatly into the dredge and was wired and roped into position to act as a lining. This measure achieved the desired result and on the fifth haul we offloaded a sackful of Crepidula fornicata with numerous Turritella communis specimens both alive and dead, a wide variety of other molluscs, shell fragments and sand. We sorted through as much as we could and samples were taken and labelled by some of the party for later examination. These

samples later produced several unusual species and some new records for the area.

On the sixth trawl we retraced our steps on the first part of the first haul. Again we pulled in a sack, this time bulging with its contents and dripping cloudy grey seawater. The contents were similar to haul number 5 but there was rather more muddy sand. We beavered away, sieving energetically and samples were taken and labelled. This load contained a very interesting find - a specimen of what later proved to be a juvenile Erato voluta was noticed by Alex Arthur on the underside of a pile of Crepidula fornicata. This was taken by Dennis Seaward who kept the mollusc alive at home whilst it was photographed and then sent it to Dr. Vera Fretter for verification along with other material for confirmation of identification.

The last haul of the day was a sack full of mud. The dredge obligingly held out until it was manoeuvred over the stern, at which point the wire gave way and the sacking collapsed at the feet of its handlers! Standing, six inches deep in mud, it was doled out by two of our number - like institutional rations of some anonymous gruel, to waiting receptacles! But what a feast - live specimens of Nassarius pygmaeus, Trivia arctica, Omalogyra atomus, Haminoea navicula, Philine aperta, Turbonillas elegantissima and fenestrata and Thyasira flexuosa were among the species collected from the mud.

By this time, the dredge having given up the ghost and it being four o'clock, we were all cold, hungry and tired. One of our party had come along for the 'ride' and had spent the whole day in the 'doghouse' huddled over a stove trying to keep warm. The cold had got through to most of us and, in any case, dusk was approaching.

We steamed back to Weymouth Harbour and moored at the Quay near the Town Bridge. We settled our debts and thanked our 'host'. As will be seen from the species distribution list below, what had started out as an unpromising trip had proved to be a worthwhile exercise and one to be repeated - when the weather is warmer.

This was the writer's first experience of a dredging trip and had been anticipated with enthusiasm. It had certainly measured up to expectations and I would recommend any other members who have not taken part in such a venture to snap up the opportunity if it arises.

I am grateful to Dennis Seaward and Celia Pain for aiding my memory by making available their species lists for the trip. A table is shown below with additions by other members of the party.

Jan Light

SPECIES LIST - Dredging Trip, Saturday 12th. November 1983 inside Weymouth Bay and Portland Harbour

Species	Station Number						
	1	2	3	4	5	6	7
<u>Acanthochitona crinitus</u>						b	
<u>Lepidopleurus</u> sp.		a					
<u>Acmaea virginea</u>			a			b	
<u>Alvania beani</u>						c	
<u>Alvania crassa</u>					c	c	
<u>Bittium reticulatum</u>					c	c	
<u>Buccinum undatum</u>				a			

Species	Station Number						
	1	2	3	4	5	6	7
<u>Calyptraea chinensis</u>		a					
<u>Cantharidus exasperatus</u>					c	c	
<u>Cingula semicostata</u>						c	
<u>Crepidula fornicata</u>	a	a	a	a	a	a	a
<u>Emarginula reticulata</u>						c	
<u>Erato voluta (juv.)</u>						a	
<u>cf Gibbula cineraria</u>						b	
<u>Gibbula magus</u>					a	a	
<u>Littorina sp.</u>					b		
<u>Mangelia brachystoma</u>					a		
<u>Nassarius incrassatus</u>	a				a	a	
<u>Nassarius pygmaeus</u>					c	a	a
<u>Nassarius reticulatus</u>						a	
<u>Ocenebra erinacea</u>	a				a	a	
<u>Omalogyra atomus</u>							a
<u>Rissoa albella</u>					a	a	a
<u>Rissoa lilacina seg.</u>			a			a	a
<u>Rissoa parva</u>			a		c		c
<u>Tornus subcarinatus</u>	c				c	c	
<u>Tricolia pullus</u>			a		c	c	c
<u>Trivia arctica</u>							a
<u>Turritella communis</u>					a	a	a
<u>Velutina sp.</u>						c	
<u>Chrysallida obtusa</u>					c	c	c
<u>Eulimella laevis</u>						c	a
<u>Haminoea navicula</u>						a	b
<u>Odostomia acuta</u>		a			a	a	a
<u>Odostomia eulimoides</u>						a	
<u>Odostomia lukisii</u>					a		
<u>Onchidoris bilamellata</u>				a			
<u>Philine aperta</u>							a
<u>Turbonilla elegantissima</u>					a	a	a
<u>Turbonilla fenestrata</u>					a	a	a
<u>Dentalium vulgatum</u>						c	
<u>Abra alba</u>						a	a
<u>Abra nitida</u>						a	a
<u>Acanthocardia sp. juv.</u>					a		
<u>Anomia sp.</u>						a	
<u>Anomia ephippium</u>			a		a		
<u>Barnea candida</u>	a						
<u>Barnea parva</u>	a						
<u>Cerastoderma edule</u>							b
<u>Chlamys opercularis</u>					a	a	
<u>Chlamys varia</u>	a					a	
<u>Corbula gibba</u>					a	a	a
<u>Cultellus pellucidus</u>						a	
<u>Hiatella arctica</u>					c		
<u>Lepton nitidum</u>					c		
<u>Lepton squamosum frag.</u>					c		
<u>Mysella bidentata</u>							b
<u>Nucula tenuis</u>					a	a	a
<u>Pandora pinna</u>						a	
<u>Parvicardium exiguum</u>					c		
<u>Parvicardium papillosum</u>						c	

Species	Station Number						
	1	2	3	4	5	6	7
<u>Solecurtus scopula</u>	c						
<u>Spisula</u> sp. juv.					a	a	
<u>Thyasira flexuosa</u>					a	a	a
<u>Venus ovata</u>					a		
Depth in fathoms	8-10	8-10	1-5	5	7	9-10	2-5

"OLD PRICE" (JOHN PRICE 1803-1887)

John Price, "Old Price" or "O.P." as he was affectionately termed by his friends, was one of the coterie of pioneer students of the nudibranchiate molluscs (sea-slugs). Prominent members of the group were Dr. Dennis Embleton (1810-1900), Joshua Alder (1792-1867), Albany Hancock (1806-1873), Dr. David Landsborough (1779-1854), in Belfast G. C. Hyndman (1796-1867) and William Thompson (1805-1852) and "Mr. Price of Birkenhead". (see Alder & Hancock, 1855, preface)

Though often associated with the city of Chester John Price was born at Pwll-y-Crochan, near Colwyn Bay, North Wales, on 3 June 1803. He was educated firstly in Chester and later under Dr. Butler at Shrewsbury where Darwin was a school-fellow. He took his M.A. at Cambridge in 1826. Once qualified he took various teaching posts, and for many years lived in Birkenhead.

At the beginning of the nineteenth century the town of Birkenhead hardly existed, and the Woodside slip, where Price collected so fruitfully, was very small, composed merely of large boulders and planks. Indeed, at this time the high road from Chester to the Waterside came down to the shore at the point called Ivy Rock and ran to the old Woodside ferry where it ended, and there was only the open shore of the river Mersey.

It is not known how Price became interested in marine life in general and nudibranchs in particular but in his own book (Old Price's Remains pp.5-6) it is related how he and Dean Conybeare were seen, many years ago, "on the muddy slope near Woodside Ferry gathering living tenants of our (then) highly favoured locality". In 1826 a new slip was constructed about 100 yards to the west of the old one which was then abandoned. Price saw Birkenhead grow into a city - and his favourite piece of shoreline destroyed in the process.

Nevertheless, by 1847 he was sufficiently well-known in the scientific world of the time for the august British Association for the Advancement of Science to grant him £10 (then quite a considerable sum of money!) towards his work on a local fauna, viz. Birkenhead Shore. The project was backed by Sir Richard Owen and many leading workers of the day, and also by the Prince Consort, but when, as Price ruefully stated "all was in apple-pie order for committing to paper" the unfortunate author contracted dysentery and nearly died.

A necessarily slow recovery, diminished leisure, and (I quote from Old Price's Remains) "the best fishing-ground carried away bodily two or three feet deep to make a promenade and such luxuries. For which, under the name of 'Improvements', our author was taxed with other ratepayers - and - no redress". All conspired to delay further the hoped-for Birkenhead Shore. Until 1852 it was still hoped to produce the work but then it was finally abandoned and fragments are embedded in the mélange published as Old Price's Remains (1863-64).

Isaac Byerley in his Fauna of Liverpool (1854) lists half a dozen species of

nudibranchiate molluscs from Woodside (Birkenhead) collected by Price; it may be of interest to list what we have lost. Price's finds are Dendronotus arborescens (Ascanius, 1774) Plentiful about Woodside slip and the adjoining stony ground. Also at New Brighton in 1854.
Doto coronata (Gmelin, 1791) Once.
Ancula cristata (Alder, 1841)
Adalaria proxima (Alder & Hancock, 1854) First found by Mr. Price. Jeffreys (1869, p.88) adds "Among rocks and seaweeds at Birkenhead, where it was first found by Mr. Price, but it has been now nearly extirpated by the alterations on that shore".
Catriona aurantia (Alder & Hancock, 1842) Woodside. Also at New Brighton.
Embletonia pallida (Alder & Hancock, 1854) First found by Mr. Price upon Birkenhead shore in 1854.

Of these six species two were then new to science, namely Adalaria proxima and Embletonia pallida; the latter, however, was later recognised as the earlier Tergipes adspersa (Nordmann) and is now to be known as Tenellia adspersa (Nordmann). It is still a rare, or perhaps overlooked, species.

Price also wrote charmingly and discursively upon "Beroe babies" and "Cydippe" and throughout Old Price's Remains there are all sorts of careful observations on a wide range of species, showing him to have been a good all-round naturalist. He notes, for instance, the hard tufa deposited by the Petrifying Well in Patrick Wood, Bromborough (at the end of my garden! NFMCM) and tells how he heard a TRUE nightingale in Birkenhead Park "where I went to laugh at a Reedwren and his auditors" on 23 May 1863. He regularly notes the species and prices of assorted wildfowl offered for sale in Birkenhead and Liverpool markets. Today, we would be appalled to see for sale some of the species he mentions.

Price eventually settled in Chester and was associated with Charles Kingsley in the formation of the Chester Society of Natural Sciences Literature and Art in 1871. Canon Kingsley would only accept young men for his botanical classes, and suggested "Let John Price (O.P.) form a Class and take the ladies; he is the nicest man and should have the nicest pupils". So it was arranged and the syllabus was entitled Botany for Beginners - an old course of eight Lectures, but capable of indefinite expansion and displacement, first given at Birkenhead, about 1843, by J. Price".

He published little on natural history subjects, unfortunately, and most of his finds are enshrined in other people's papers. The following are all I have traced by Price.

- 1846 On the embryogeny of Pulmogrades and Ciliogrades. Rept. Brit. Assoc. Adv. Sci. for 1846, pt.2; 86-87.
- 1846 On the quasi-osseous system of Acalephae. Rept. Brit. Assoc. Adv. Sci. for 1846, pt.2; p.87.
- 1860 On Cydippe. Rept. Brit. Assoc. Adv. Sci. for 1860, pt.2; 120.
- 1863,4 Old Price's Remains. 12 pts. 8vo. London, Liverpool.
- 1875 Llandudno and how to enjoy it. Being a handy guide to the town and neighbourhood. London. 8vo.
- 1878 Proliferous Leaves and notes thereon. Proc. Chester Soc. Nat. Sci. Lit. & Art no.2, pp.63-66.

In 1878 he was awarded the Kingsley Memorial Medal for "Marine Zoology, Botany, and many years of endeavour to promote scientific studies" (Siddall 1911 p.53).

His portrait appears in Siddall (1911, p.12). He died in Chester on October 14th. 1887, aged 84.

Nora F. McMillan

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| Byerley, I. | 1854 | <u>Fauna of Liverpool. Proc. Lit. & Phil. Soc. Liverp. No. 8; appendix. (Also issued separately in book form, 1856).</u> |
| Jeffreys, J.G. | 1869 | <u>British Conchology vol. 5. London.</u> |
| Siddall, J.D. | 1911 | <u>The formation of the Chester Society of Natural Science, Literature, and Art. Chester.</u> |

RECORDS OF BIRDS FEEDING ON HELIX POMATIA

Recently Nora McMillan (1984: 152) raised the question whether any birds are attacking Helix pomatia. The answer is yes. Birds are feeding on Helix pomatia, however, literature records seem to be rather scarce.

Matzke (1961: 299 and 1962: 383) mentioned the find of a slightly broken shell of a not yet fully grown specimen of H. pomatia at an anvil of the Fieldfare, Turdus pilaris, near Brand-Erbisdorf in the vicinity of Freiberg, Sachsen, D.D.R. Predation on H. pomatia by Turdus species is also known from Great Britain as can be seen from the statement by Pollard (1975:323): "The shells of immature snails, sometimes of almost adult size, were found in small numbers at thrush anvils, especially in dry weather".

Thrushes are, however, not the only birds which are occasionally feeding on Helix pomatia. Rékási & Richnovszky (1974: 47) mentioned the presence of a juvenile specimen in the stomach of the Collared Dove, Streptopelia decaocto, caught near Bacsalmas, Hungary. The same authors recorded another juvenile Helix pomatia from the stomach of a Roller, Coracias garrulus, collected near Malcoci, Romania. This latter record was mentioned once again by Kiss, Rékási & Richnovszky (1978: 39). In that paper they mentioned also the find of two juvenile specimens in a stomach of a Pheasant, Phasianus colchicus, shot near Letea, Romania.

From these data it is clear that birds are indeed feeding on Helix pomatia. However, so far they seem to prefer juvenile or semi-adult specimens. I am not aware of any record of predation on adult Helix pomatia.

Noteworthy is still the fact that besides birds also several mammals and beetles are known to feed on this Helix species.

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| McMillan, N.F., 1984 | <u>Do birds eat Helix pomatia? The Conchologists' Newsletter, 88: 152-153.</u> |
| Pollard, E., 1975 | <u>Aspects of the ecology of Helix pomatia. J. Anim. Ecol., 44: 305-329.</u> |
| Rékási, J. & A. Richnovszky, 1974 | <u>Angaben zur Frage der Schneckennahrung bei Vögeln.</u> |

GENERAL NOTES

JOINT MEETING WITH THE MALACOLOGICAL SOCIETY OF LONDON

Saturday 17th. November 1984 at 2.30 p.m. in the Demonstration Room, British Museum (Natural History), South Kensington.

The title of this meeting is BIVALVES, RECENT AND FOSSIL and there will be short talks by members of both societies.

Session 1 - Chaired by the Conchological Society

- | | |
|------------------------|--|
| Dr. A.J. Rundle | - Identification of fossil bivalve fragments |
| Dr. E. Sandor | - The family Pectinidae Rafinesque, 1815 |
| Mr. J. Llewellyn Jones | - Man, the scallop and its relatives |
| Mr. T. Pain | - Freshwater 'oysters' - <u>Etheria</u> |

Tea

Session 2 - Chaired by the Malacological Society

- | | |
|--|---|
| Dr. G. Oliver (National Museum of Wales) | - Arcoid bivalves |
| Dr. J. Taylor (British Museum [Natural History]) | - Bivalve shell structure |
| Mrs. H. Ross (Royal Ulster Museum) | - The freshwater pearl mussel
<u>Margaritifera</u> |
| Dr. J.E. Chatfield (Gilbert White Museum) | - Freshwater pea-shells <u>Pisidium</u> |

NOTES ON HISTORICAL CONCHOLOGY 1

Flint Jack (1812-1870's)

A recent issue of the Geological Curator (1983 3[7] 435-443) contains a very interesting article on Flint Jack by A. Credland of Kingston-upon-Hull City Museum. A man of numerous aliases, Flint Jack collected fossils and manufactured forgeries of both fossils and antiquities, especially flint implements, hence his name. His peregrinations took him all over the country, especially the north-east of England and even to Ireland. The only record, to date, of any conchological work was in 1846-7 when he was employed by the Yorkshire Museum to collect fossils and shells at Bridlington. Although shell collecting was only a very minor part of his trade it would seem that Flint Jack indulged in anything that had financial potential, even to the extent of stealing.

In 1867 Flint Jack after being found guilty of theft was placed in Bedford gaol and it was here whilst serving a twelve month sentence that he was interviewed by Llewellyn Jewitt, F.S.A. He had assumed a variety of aliases whilst selling his wares and in the north was known as John Wilson of Burlington (Bridlington) and Jerry Taylor of Billery Dale, Yorkshire moors. More widely he was referred to by the nicknames Fossil Billy, Cockney Bill, Bones, Shirtless, Snake Billy and the Old Antiquarian, but universally as Flint Jack.

Frank Stevens refers to William Smith (alias Skin and Grief or Snake Willy) who was active in East Yorkshire making flints, urns and hammer heads c.1855 and this may be the same man.

The details of his dealings are not well known and further research may well reveal other shell collecting expeditions. (from Peter Lingwood)

"The Orkney Islands Council have on their payroll a 'Shellfish Co-ordinator for Orkney Islands Council'". How does one co-ordinate molluscs? A ribald museum colleague suggested a matrimonial agency for winkles!! With which thought I leave you.
Nora McMillan

MONACHA CANTIANA (MONTAGU) IN NW ENGLAND AND WALES

In the Atlas of the non-marine Mollusca of the British Isles (1976) the map showing the distribution of Monacha cantiana indicates a SE and E. range of the species. In the north-west a solitary dot represents an occurrence at Mold Gravel Works, Bryn, near Mold, Clwyd "on a brambly bank by the entrance from the Mold Road" in 1970 (recorded in J. Conch. Lond. 27: 445) (NFMCM). It was not present in 1950.

Specimens were then taken on 12 April 1980 on old dunes at Llandulas, N. Wales (NGR SH91-78-) by W.F. Edwards.

Finally, Chris Felton has found the species "under stones of embankment lining R. Dee at Chester (NGR SJ388658)" on 17 October 1983. A voucher specimen has been placed in the Merseyside County Museums, Liverpool, as this is the first Cheshire record.

The Atlas also shows a dot for the species in Anglesey but I have no information about this record.

Monacha cantiana is obviously a highly successful colonist!

Nora F. McMillan, Merseyside County Museums, Liverpool

ANNUAL GENERAL MEETING MARCH 1985

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

Rule No. 12. Candidates for nomination to the Council shall be paid-up members of The Society and shall be nominated by two members. Nominations, other than those made by the Council itself, shall be sent in writing to the Hon. Secretary at least six weeks before the A.G.M., and shall be accompanied by a signed declaration of the candidate's willingness to serve.

NOTE Nominations must be received by the Hon. Secretary NOT LATER THAN 31 December 1984.

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COLLECTORS IN EAST AFRICA - 11. J. KIRK

Sir John Kirk (1832-1922)

Sir John Kirk, G.C.M.G., K.C.B., F.R.S., M.D., is one of my heroes and was one of the best diplomatists ever to leave England. He was a first rate naturalist and very many of his plants are at Kew often accompanied by valuable paintings and sketches made in the field. His interest remained with him all his life and he was a close friend of Sir W. Hooker and Sir J. D. Hooker for over 50 years. His correspondence with these two successive directors of Kew is preserved in that institution. Apart from collecting he also carried out several personal scientific investigations of high quality. The non-marine molluscs that he collected were worked out by various people including H. Dohrn, G. R. von Frauenfeld, E. A. Smith and Isaac Lea. Perhaps even more important than his personal collections was the influence he exerted on local Arab rulers on the coast to abandon the slave trade and to tolerate explorers, missionaries and other potential collectors.

He was born on 19 December 1832 in the Manse of Barry in Forfarshire about eight miles north of Dundee and died as recently as 1922 at Sevenoaks in Kent. He was the second of the four children of the Rev. John Kirk who was himself a keen botanist. He became interested in botany at a very early age since it was his father's principal hobby. His father tutored him at first then he attended the local high school in Arbroath and he matriculated at the age of 15 and entered Edinburgh University in 1847 at that age first the Arts faculty then the Medical School. By the time he was 22 he graduated from the medical faculty, MD, LRCS. He was also a pupil of the famous botanist Prof. I. H. Balfour during this period. He first took a post as resident physician at the Royal Edinburgh Infirmary, one of his colleagues being Joseph Lister. The Crimean war had just started and like many other young doctors Kirk sailed for the area in 1855; there he stayed until 1856 being stationed mainly at Erenkevi in the Dardanelles and at Scutari. After the Crimean episode he collected plants on Mt. Ida and Mt. Olympus before returning to London in 1856. He was soon off again, however, this time to Syria, Palestine, Egypt and Italy arriving back in London once again in 1857 when his friendship with the Hookers started. From 1858-1863 he was physician, economic botanist and naturalist (and later chief officer) to Livingstone's Zambesi Expedition. When Livingstone first approached him about this post Kirk is reported to have been so enthusiastic that he replied 'be ready tomorrow'. Actually being a good Scot he was not quite that impetuous and wanted to have details of 'the necessary expenses'. Livingstone's classic reply of 4 January 1858 was 'I am not quite clear as to what you mean with regard to necessary expenses. Suppose you shoot a buffalo there will be no expense incurred in cooking and eating it. There are no inns or hotels in the country. The lodging will all be free - expeditions of this kind cannot be successful unless all the members are willing to rough it and it will be well if we all thoroughly understand this before we start. The salary is £350 per annum.' Livingstone and Kirk got on very well and in a letter to Hooker, Livingstone recorded his personal views as follows 'The Doctor has been I can assure you a most

assiduous and painstaking collector - nothing ever deterred him from doing his duty and he did it like a man. If you can confer any favour on him you will never find a more deserving recipient - this I can say after five years of constant intercourse'. The reason Kirk remained friends with Livingstone when so many others failed is partly due to his outstanding qualities of forbearance and understanding and partly that Kirk was the only other member of the expedition with the physical toughness and the strength of will to match Livingstone's own. His last association with Livingstone was to act as a pall-bearer on 18 April 1874 at Livingstone's funeral in Westminster Abbey - the others included Stanley and Jacob Wainwright, one of the Africans who had carried Livingstone's body to the coast after his death; a long and fantastic journey of 11 months.

The Zambesi expedition only just touched on the borders of the area with which I deal but it did visit the Rovuma River. From 1866 to 1873 Kirk was Vice Consul for Zanzibar and later Assistant Political Agent. In 1873 he was appointed Consul General at Zanzibar and under his influence the Sultan abandoned slavery in his dominions. In 1880 he was Political Agent at Zanzibar and was created KCMG in 1881. He retired in 1887 on account of ill-health. From 1889-1890 he was Plenipotentiary for Britain at the Brussels Anti-Slavery Conference where his long association with the problem was of enormous value. He was created KCB in 1890. He was one of those many giants produced by the Victorian era and his great strength of character shows in the various portraits which exist. He was very interested in the practical uses of plants and during the Zambesi expedition he made experiments with Strophanthus which was used as an arrow poison by the natives in the area. He discovered its effect on the heart and sent material back to Edinburgh for more detailed investigation. As a result strophanthinum was added to the pharmacopeia and a minor industry started in Central Africa. It is still used as a heart stimulant. He was quick to see the possibilities of an area and published a report on the natural products and capabilities of various areas he visited with Livingstone. He recommended the Shire Highlands for European settlement, the Manganja Hills for coffee planting and the Batoka Highlands for cattle ranching. He fostered the Zanzibar copal industry, the resin from a leguminous plant important in the manufacture of varnish. He also developed the important india-rubber trade, the rubber being obtained not from Hevea (then not grown in the Old World) but from wild climbers of the genus Landolphia. He also took an interest in the fibre obtainable from the genus Sansevieria. Impatiens walleriana (= I. sultanii) the common busy lizzy, now I would say too well known in cultivation, was first introduced by Kirk. He published a revision of the economically important East African palms. He was also one of the earliest amateur photographers and certainly the first to take photographs of vegetation in the Zambesi area if not in tropical Africa. Wax negatives of the 1859 photographs are still extant and quite excellent prints taken from them. Many of these have been reproduced in Coupland's fascinating book 'Kirk on the Zambesi' and by Foster in his 'The Zambesi Journal and letters of Dr. John Kirk' and 'The Zambesi Doctors'.

List of Molluscs described from material collected by J. Kirk.

Achatina kirkii Smith, 1880.

Between Zanzibar and Lake Tanganyika.

= Achatina craveni Smith, 1881.

Holotype BM: 80.12.22.2.

Buliminus kirkii Dohrn, 1865.

Mozambique, near Cabaceira. = Pseudoglossula kirkii (Dohrn, 1865). Formerly a type specimen* at BM but mislaid.

Ennea hanningtoni Smith, 1890.

Tanzania, Usagara, Hannington and Kirk (& also Mamboia leg. Last) = Gulella sexdentata (von Martens, 1869).

Syntypes: BM 1884: 2.19.68-70 (purchased from Hannington) 1885.5.25. 103-4

(purchased from Last) 1885.6. 25.6-7

- Ennea laevigata Dohrn, 1865. (purchased from E. Gerrard jun. and obtained by Sir John Kirk). Lake Malawi, Mumba I. = Gulella laevigata (Dohrn, 1865). Syntype* BM 1862. 9.25.21 and further possible syntype in Cuming collection.
- Gibbus (Gonidomus) breviculus Smith, 1890. Tanzania, Usagara. = Gonaxis breviculus (Smith, 1890). Syntypes BM 1855-6-25. 8-9, 2 specimens lectotype marked with red spot by Connolly ('holotype' sic). Southern end of Lake Malawi and near Lake Pamolombue through which the R. Shire flows after leaving Lake Malawi. Unchanged. Type not found.
- Lanistes nyassanus Dohrn, 1865. Southern end of Lake Malawi and in upper part of R. Shire. = Melanoides nodicincta (Dohrn, 1865). Syntypes* BM 90.3.27.1 and Cuming collection, 3 specimens, lectotype marked with red spot by Connolly ('holotype' sic).
- Melania nodicincta Dohrn, 1865. R. Zambesi, Victoria Falls, rapids above the falls = Melanoides victorinae (Dohrn, 1865). Syntypes*: BM Cuming collection 3 specimens.
- Melania victorinae Dohrn, 1865. Lake Malawi. = Mutela alata (Lea, 1864). Syntypes* BM Cuming collection 3 specimens.
- Spatha alata Lea, 1864. Mozambique ("freshwaters near Mozambique") = Aspatharia petersi modesta (Lea, 1864) fide Pilsbry & Bequaert (modern attribution not known). No type* found in BM.
- Spatha modesta Lea, 1864. Lake Malawi. = Aspatharia (Spathopsis) nyassaensis (Lea, 1864). No types* found in BM.
- Spatha nyassaensis Lea, 1864. Kenya** on hills between the mouth of the R. Dana (i.e. Tana) and Mombasa. = Gonaxis craveni (Smith, 1880). Syntypes: BM 80.12.22. 3-4 2 specimens lectotype marked with red spot by Connolly ('holotype' sic).
- Streptaxis craveni Smith, 1880. Lake Malawi, Mumba I. = Gonaxis (Pseudogonaxis) kirkii (Dohrn, 1865). Syntype: BM 62.9.25.20.
- Streptaxis kirkii Dohrn, 1865. Lake Malawi. = Nyassunio nyassaensis aferula (Lea, 1864). Type*: BM Cuming collection 1 specimen.
- Unio aferula Lea, 1864. Lake Malawi. = Nyassunio nyassaensis nyassaensis (Lea, 1864). Type*: BM Cuming collection 1 specimen.
- Unio kirkii Lea, 1864. Lake Malawi. = Nyassunio nyassaensis nyassaensis (Lea, 1864). Syntypes* BM Cuming collection 2 specimens.
- Unio nyassaensis Lea, 1864. Lake Malawi. = Bellamya capillata (von Frauenfeld, 1865). Syntypes: BM, Cuming collection 2 specimens, lectotype with red spot.
- Vivipara capillata von Frauenfeld, 1865. Lake Malawi. = Bellamya jeffreysii (von Frauenfeld, 1865). Syntypes: BM, Cuming collection 2 specimens (labelled type and paratype).
- Vivipara jeffreysii von Frauenfeld, 1865.

Vivipara robertsoni von Frauenfeld, 1865. Lake Malawi. = Bellamya robertsoni (von Frauenfeld, 1865). No type material found.

Notes on the above list. *An asterisk appended to the word type indicates I am not sure of the actual status of the material in the BM. The true types are or were presumably in the collections of Dohrn (destroyed at Stettin during the Second World War) and Lea (probably Acad. Sci. Philadelphia); I have no evidence that the authors actually saw the material in the Cuming collection. It seems unlikely they had it all and then sent some back; more likely that duplicates were retained which are therefore not really of any standing as types. Lea speaks of the 'liberality of Mr. Cuming' so it is clear he kept the material sent to him. In the case of the Viviparidae, von Frauenfeld actually mentions that he was staying in London when he examined and described the material so the Cuming specimens are true syntypes even if von Frauenfeld did retain material. Crowley, Pain, and Woodward (1964) considered all the Bellamya to be variants of B. unicolor (Olivier) but I agree with D. Brown that this is not correct. **There are no hills to speak of between the mouth of the Tana and Mombasa. I suspect the material came from the E. Usambaras which Kirk certainly visited. A different species lives in the coastal forests near Mombasa.

Apart from the species described from material collected by Kirk several others were named after him, e.g. Achatina kirkii Craven, 1880 (= Pseudoglessula leroyi fasciata Connolly), Spathella kirki Ancey 1894 (now Aspatharia kirki (Ancey 1894) and the beautiful Limnotrochus kirki Smith 1880 (now Chytra kirki (Smith, 1880)).

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B. Verdcourt

A MARINE NATURE RESERVE ON THE LIZARD?

The passing of the Wildlife and Countryside Act (1981) allows, for the first time, for protection of important marine biological sites at extreme low water mark and in the shallow sea offshore. Previously it had only been possible to designate

Sites of Special Scientific Interest (SSSIs) and Nature Reserves down to mean low water mark in England and Wales (means low water of spring tides in Scotland), so excluding what to the marine biologist is often the most valuable part of the shore - that briefly exposed a few times a year on the lowest spring tides. There are already a number of SSSIs and Nature Reserves which include sections of foreshore - these include areas of salt marsh and mud flats, sometimes with eel-grass (*Zostera* sp.), which are important feeding areas for estuarine and coastal birds. Very few sites are scheduled for the intrinsic value of their marine fauna and flora.

It is proposed to establish in the first place seven statutory Marine Nature Reserves (MNRs) in Great Britain: in the Scilly Isles and Lundy in England; Skomer Island, Bardsey and the adjacent Llyn peninsula, and the Menai Straits in Wales; and Loch Sween and St. Abb's Head in Scotland. These sites have been chosen for the scientific value of their intertidal and/or sublittoral communities, although other factors such as ease of management no doubt entered into the final choice. For each proposed reserve there will be a period of consultation with owners of the foreshore and sea bed, and with representatives of all who use the area. In general it is not proposed to restrict traditional usages, although the Act allows for the making of byelaws for regulation of the area, and where there is a conflict of interests it is hoped that a compromise will be reached. These consultations will be initiated by the Nature Conservancy Council with the object of presenting a considered case to the appropriate Secretary of State for designation of an MNR.

The necessary consultations are likely to be lengthy, and could, if thought necessary, lead to a public inquiry. It therefore seems likely that much of NCC's resources in the marine sector will be engaged for some years to come in preparing the way for the first seven statutory MNRs.

While many will welcome the establishment of these MNRs, it has been argued that the sites selected are not those in greatest need of protection. Most of them are remote, several are island sites, and all are relatively remote from industrial development, pollution sources, or heavy pressure from leisure activities. Moreover a number of them (Lundy, Skomer, Bardsey, St. Abb's) are already covered by voluntary conservation agreements, which appear to be working well.

In the aftermath of the "Torrey Canyon" shipwreck of 1967, when the coasts of West Cornwall were heavily polluted by oil, the Nature Conservancy compiled, in consultation with other interests, a list of coastal sites particularly sensitive to oil pollution and the measures (such as 'detergent' spraying) used to combat it. The list includes a number of estuarine sites important for their bird life, salt marshes, and stretches of rocky and sediment shores of marine biological importance. The NCC subsequently commissioned a joint survey by the Scottish Marine Biological Association and the Marine Biological Association for classification of littoral sites and the identification of those of the highest value. These intertidal surveys resulted in the production of reports covering south-west England, south-west Wales, north-west Scotland, the Moray Firth and the Outer Hebrides. Final reports (SMBA/MBA, 1980) identified those sites of National and International importance. In England and Wales the only sites rated as of International importance were the Kingsbridge estuary, the Helford River, and the Scilly Isles. In addition, sites of National importance were identified in Cornwall as at St. Mawes inlet (sediment shores in Place Cove), and the fully-exposed shores of West Cornwall between Land's End and Cape Cornwall. Of these sites the Scilly Isles is likely to become Britain's first statutory Marine Nature Reserve, and the St. Mawes inlet is already covered by voluntary agreement, within the wider Roseland Marine Conservation Area. The shores around Land's End are as yet undesignated, but are in no way threatened, so what of the Helford River?

The Helford River has long been recognised as having high marine biological

value on account of its sheltered sediment and rocky shores, unaffected by pollution, and with salinity approaching that of the open sea, since freshwater inflow is minimal. Within the inlet there are valuable shores of sand and muddy sand at Helford Passage, Helford Point, Treath, and in the nearby Gillan Harbour to the south (Fig. 1). Some of these shores have good growths of eel-grass (*Zostera marina*) at low tide, which at Helford Passage extends to several acres in extent. In addition to animals burrowing in these sediment shores there are a number of surface-living organisms such as anemones and sea-squirts growing attached to stones on the surface of the more sheltered flats, and at Helford Point the shore is covered by stone 'clitter' which provides a variety of habitats for further animals and algae. There are good rocky shores at the mouth of the river, near Rosemullion Head and Nare Point.

Records of the fauna and flora of the Helford River go back many years. Cock's (1849 et seq) Fauna of Falmouth contains records from the area, as does Tregelles's (1885, 1896) lists of marine molluscs of Cornwall, and there are many records in Clark's (1906) Victoria County History of Cornwall. An account of the *Zostera* beds at Helford Passage is given by Gardiner (1927). In 1949 Mr. G. M. Spooner and I spent a week making a survey of the intertidal flats in the lower part of the inlet - a report was not published, but notes and specimens from that time should prove useful in tracing subsequent changes in the communities. Bristol and Reading University Zoology departments have regularly held field courses in the area, and many others have collected there in recent years, including further education courses organised by Mrs. Stella Turk and Roger Burrows.

The sand and mud flats towards low tide mark support a unique assemblage of worms, crustaceans, molluscs and echinoderms which elsewhere occur only in shallow water offshore. Comparable habitats occur in Place Cove and in the Kingsbridge estuary, but these sites are more limited in extent, and each has its individual characteristics. Among features of particular interest are commensal associations - pairs of species which live together but in a relationship which does not amount to parasitism. Examples are the scale-worm *Lepidasthenia argus* with the burrowing worm *Amphitrite edwardsi*, and an amphipod crustacean, *Urothoe*, in close association with the heart-urchin *Echinocardium cordatum*. Of special interest also is a new species of goby (*Gobius couchi*), described for the first time from Helford Point (Miller and El-Tawil, 1974).

There is an old established custom of 'trigging' for cockles and other shellfish at Helford on Good Friday, and similar activities coupled with bait digging now continue through much of the year. There has on occasion been evidence of collecting for bait - on what amounts to a commercial scale - for use outside the area.

There is increasing evidence that over the years there has been a decline in the fauna and flora of the low-tide flats. It is difficult to quantify such changes, but Dr. T. E. Thompson of Bristol University, who visits Helford each year with classes, has noticed a distinct deterioration in the fauna over the last few years. In some places there has been a decline in the extent of the *Zostera* beds, notably at Gillan Harbour where a bed in the middle of this inlet has completely disappeared within the last twenty years (personal observations). *Zostera* is of importance in providing a source of attachment for small animals and plants, and its dead and decaying fronds provide a source of organic food for filter- and deposit-feeding invertebrates. In addition the roots bind the substratum and make it more stable.

The important shores in the Helford River and Gillan Harbour are limited in extent. Their decline seems to have occurred because they cannot withstand the increasing pressures, whether from bait or shellfish collectors, or from marine biologists. Digging in the flats disturbs and kills much more than is actually being sought, and some check is needed before the habitats deteriorate irretrievably.

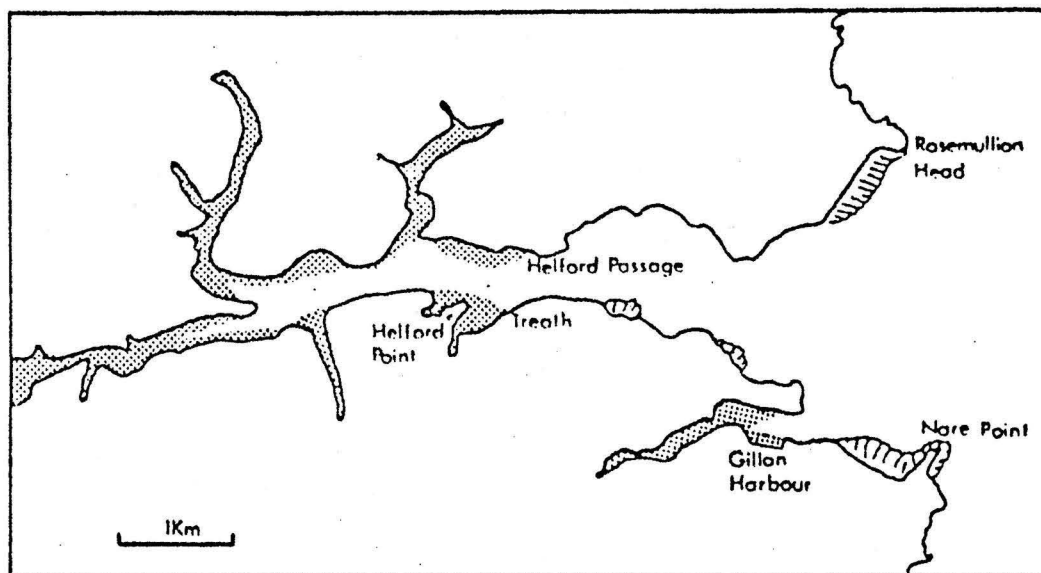


FIGURE 1

Map of the Helford River, showing principal areas of marine biological interest.

In an area such as the Helford River designation of a marine nature reserve would be a much more complex operation than for the more remote areas currently being considered as statutory MNRs. The biological importance of the Helford River is not in question, but in arriving at any conservation agreement many interests would have to be respected, and voluntary co-operation rather than statutory controls would seem more appropriate. The view that activities such as trawling have been in existence for many years carries some weight, but it is clear that collecting has increased to such an extent that the habitat is being harmed. Because an activity is 'traditional' does not give carte blanche for its unlimited expansion: sometime a halt must be called. Fishermen are (or should be) conservationists at heart, and it should not be difficult to arrive at a compromise which will satisfy all legitimate interests. Perhaps it would be possible to designate separate areas for different activities, or have a 'close season' at certain times of the year. Certainly we should not stand aside and see the situation go from bad to worse for lack of a voluntary agreement.

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RARE SHELLS CRUSHED

The June issue of the Newsletter, No. 89, asked for more information about the destruction by vandals of a rare collection of shells in Bristol.

Early in January 1984 teenage vandals caused serious damage to the 18th. century Grotto in the gardens of Goldney House which is one of the halls of residence of the University of Bristol. Luckily the vandals were spotted and disturbed before they were able to destroy the Grotto completely.

The Grotto was constructed by Thomas Goldney in the 18th. century. It consists of a number of underground passages the walls of which are lined with sea shells, mother of pearl, quartz and other rocks which reflect light. The shells were collected by Bristol sea captains from all parts of the world and replacing these will be difficult. Damage to the stone lion in the Grotto will be more readily repaired.

The incident was widely reported in the newspapers and on radio and television. Dr. Summerlee the warden has received many letters and telephone calls from members of the public in this country and abroad offering sympathy and in some cases practical help.

It has been discovered that the wooden frame onto which the shells and semi-precious stones were fixed has rotted away and this was one of the reasons why the damage to the Grotto was so severe. The estimated cost of repair of the frame is £6,000. Generous contributions to the restoration have been made by the City Council and by the Alumni Foundation but some £1,500 is required to reach the necessary target needed for the restoration.

Two members of our Society Dr. J. F. W. McOmie and Dr. T. E. Thompson together with Professor R. J. G. Savage have been identifying and listing the material. Of the molluscs some 40% are British Marine, 40% West Indian and the remainder mostly Indo-Pacific. A full list of shells which are required for the restoration will be available soon. It is known already that some 200 specimens of Strombus gigas are needed. Specimens do not have to be perfect because they could be mounted to exhibit their best face in the Grotto.

Donations of money, shells and semi-precious stones, particularly 'Bristol diamond', are welcomed. Contributions should be sent to Dr. Alastair Summerlee, Warden of Goldney House, Lower Clifton Hill, Bristol, [REDACTED].

Alan Bebbington

P.S. Work on the restoration of the Grotto has now started. Shells of two species are urgently required for the next phase: 40-50 specimens of Haliotis tuberculata with shell lengths over 7 cm. and a pair of large Pinna with shell lengths in the range of 38-46 cm.

COCKLES AT A FULL MOON: SOME 17th. and 18th. CENTURY MOLLUSCAN RECIPES

Whilst researching manuscripts for a period recipe book, Mr. P. C. D. Brears, the Director of Leeds City Museums, came across the following recipes for shellfish and brought them to my notice. The recipes, which are in the main unpublished, come from several sources, dating from 1683 to 1746.

The first two recipes are taken from the Saville Recipe Book, manuscript number DD148 in the archives of the Yorkshire Archaeological Society, and are dated 1683.

1. To pickle Oysters or Cockles. 1683

R. your Cockles & washe them very well in two or three waters, then putt them in to a Pan over the fire, & when they open take them out of the shells, and wash them againe very well, & save the Liquour, & straine itt from the sand, then boyle them a while with theur owne Liquour, & some white wine, & all sorts of spice, & Lemon-pill, but not too much; then barrell them upp.

2. To Stew Oysters. 1683

Open Oysters, keep (the) liquour by itt self, washe the Oysters well in wine, lay them in a dishe dry, put thereon liquour to them strained through a cloth, a little wine, paper, cloves, mace, & salt, then put butter into the fryinge panne, when itt is melted put in the Oysters & all the rest, put in some Time & Parsley shred small, & when they are almost enough, take three eggs beat'n very well with wine, putt itt in, & then let your Oysters bee in continuall motion, when they are enough, serve them, and squeeze some Lemon and Orange on them.

The next recipe, from 1735, and recipes 4 and 5, dated 1741, are from the Harriet Fox Recipe Book in the Lane-Fox Manuscript Collection reference number LF134, housed in the Leeds City Archives Department. It should be noted that Harriet Fox used the term Oyster in connection with these three recipes, but it is almost certain that the shellfish she used in the preparation of these dishes was the common mussel Mytilus edulis L. In the recipe for Oyster Sausages she refers to taking the beards off, a term used for the byssus threads of the common mussel.

3. To Make Oyster Sausages. 1735

Take a pound of the inside of a Loyn of Mutton, a pound & half of fresh Beef Sueit when picked from the Skins, a pint of oysters just scalded & the beards taken off. Chop these separately very fine & then Chop & mince them all well together with 4 Eggs adding the liquor of the Oysters & a few Crumbs of Stale White Bread. Season this Meat with Peper, Salt & a little beaten Mace to your taste. put it into a Clean glazed Earthen pot, & tie it over with paper. When you use it role it into the Shape of Sausages and fry them in fresh Butter.
Mrs. Fountain.

4. To make an Oyster Pye. 1741

Take a pint of the largest Oysters you can get, clean them very well in their

own Liquor, if you have not Liquor enough add to them three or four Spoonfuls of Water; take the Kidney of a Loyn of Veal and cut it in thin Slices, and season it with a little white Pepper and Salt, so lay them in the bottom of your Dish, but there must be no paste in the bottom of your Dish, so cover them with the Oysters, strow over a little of the same seasoning you did of your Veal, and take the Marrow of one or two Bones, lay it over your Oysters, and cover them with puff Paste; when it is baked take off the Lid, put into it a Spoonful or two of white Wine, so shake it up altogether and serve it up. It is proper for a side Dish either for Noon or Night.

5. To make Oyster Loaves. 1741

Take half a dozen French Loaves, raspe them and make a Hole in the Top, take out all the crumbs, and fry them in butter till they be Crisp, so when your Oysters are stewed, put them into your Loaves, cover them up before the Fire to keep hot whilst you want them, so serve them up. They are proper for either side Dish or middle Dish: You may make Cockle Loaves or Mushroom Loaves the same way.

Recipes 6 and 7 are from English Housewifery Exemplified by Elizabeth Moxon of Pontefract, published in Leeds in 1741. The most interesting thing about these recipes is the instruction to collect cockles at a full moon, I wonder why?

6. To make an Amlet of Cockles. 1741

Take four Whites and two Yolks of Eggs, a Pint of Cream, a little Flower, a Nutmeg grated, a little Salt, a Gill of Cockles, mix all together and fry it brown. This is proper for a side Dish either Noon or Night.

7. To Pickle Cockles. 1741

Take your Cockles at a full Moon and wash them, then put them in a Pan, and cover them with a wet Cloth, when they boil, shake them, and turn them over, when they are enough put them into a Stone Bowl, take them out of the Shells, and wash them very well in their own Pickle, let the Pickle settle every time you wash them, then clear it off; when you have clean'd them, take the Pickle, put it into a Pan with a Spoonful or two of white Wine Vinegar to your Taste, put in a little Jamaica Pepper and whole Pepper, boil it very well in the Pickle, then put in your Cockles, let them have a boil, skim them, so when they are cold put them into a Bottle, with a little Oil over them, set them in a cool Place, and keep them for use.

The last three recipes date from c1746 and are taken from the Slingsby Recipe Book, manuscript number DD148, in the archives of the Yorkshire Archaeological Society.

8. Forced Oysters. c.1746

Make a stuffing with Elle, a dozen of blanch'd oysters, a little parsley, Chibool, Mushrooms, Sweet herbs, fine spices, & good fresh butter, Crumbs of bread boild in cream with a couple of yolks of eggs. Season the Whole with salt & pepper. Mince it & pound it, put some of the Minced Meat in each Shell with an oyster in ragoo over it, put again over your oyster some of the Minced meat. Couler them with beaten eggs & pour over them a little melted butter with crums of bread; put your oysters in the oven, let them be well Couler'd, Serve them up in a dish or single as garnish.

9. A Ragoo of Oysters. c.1746

Open several oysters, put them with their own liquor in a Stew-pan & let it be a little upon the Stove. Then take them out of the pan one after another, lay them on a plate, fry (a little) in some butter several Mushrooms, small ones, then moisten them with some fish broth; season them with a little salt & pepper & a bunch of sweet herbs, let them stew on a slow fire, being done take off the fatt, thicken them with some Cullis, then put the aforesaid oysters therein. Take care the oysters doe not boile. Taste the Ragoo if it be pallatable.

10. Fry'd Oysters to Garnish a Dish of Fish. Mrs. Tasker

Wash them in their own Liquor, & dry them very well, & take some Eggs Yolks beaten with spices to make it thick, they must be fry'd in Butter.

As the Lane-Fox, Saville and Slingsby families are all well-known landed gentry in Yorkshire, it is fair to assume therefore that these dishes originate from a high point in the social scale. The following notes may be of help in understanding the recipes:

Amlet = Omelette

Chibool or Chibol is an introduced species of Allium known as the Welsh Onion
Allium fistulosum L.

Couler = Colour

Cullis This is a reinforced thick stew

Elle = eel

A. Norris, Leeds City Museums

WATER REFLECTIONS

Through my 11 years work in Water Farming of Shellfish, fish and even seaweed, I've seen attempts to solve world food problems, hobby farming, get-rich-quick dreamers and lately, conservation farming.

Out of all these, the latter saddens me most.

In May '65 at the age of ten, I joined the 'Conchological Society of Great Britain and Ireland' receiving a letter to say "I had duly been elected a junior member" from the late and fondly remembered Rev. Biggs. I went to my first meeting in the Boardroom of the Natural History Museum clutching my vast shell collection of 1046 assorted, battered, sun-bleached cockles, winkles, mussels and one common piddock. What a society, dear Rev. Biggs gave me their latin names and told me the essence of shell collecting

"QUANTITY IS NOT QUALITY"

I'm now a professional aquaculturist and hope that very few contracts ever involve conservation farming. The Aquarium Fish Trade is turning slowly to hobby farming to supply aquarists demands, and I hope that all of us in the Conchological Society are ready to use our vast store of knowledge to help when hobby farming starts up to commercially supply tourist demands for shellfish.

This short article from 'International Trade in Wildlife' by Tim Inskipp and Sue Wells gives you an indication of the present situation.

Molluscs - shells for tourists

- The two families of molluscs heavily represented on the Appendices (the Unionidae on Appendix I and the Hydrobiidae on Appendix II) are not yet in trade but are endangered by pollution and could be threatened by collecting for museums etc.
- Molluscs have been exploited by man for food ever since the Stone Age, and shell jewellery has certainly been worn for hundreds of years. At the end of the last century shell collecting became fashionable in the same way that butterfly collecting had done. However, these collectors had little effect on wild populations and it is only since the 1960s, with the boom in tourism in tropical countries, that shell collecting became a serious commercial activity and seriously threatened mollusc populations.
- As with butterflies, it is the more expensive and exotic species which are in greatest demand: conches, tritons, cowries, helmet shells and other colourful species of the coral reefs in the Caribbean and Indo-Pacific. They are collected live from reefs, often indiscriminately, which leads to great wastage and frequent damage to the coral. The countries with the most desirable species include the Philippines, Papua New Guinea, Hawaii, East Africa and the Seychelles.
- The green tree snail Papustyla pulcherrima (Appendix II) of Manus Island, New Guinea, is one of the few non-marine species popular with collectors; it is also used for jewellery on account of its pretty green colour.
- Mytilus chorus, a Chilean mollusc, the only other mollusc on the appendices involved in trade, was added to Appendix II at the Costa Rica meeting.
- The Hawaiian shell trade has greatly increased over the last five years with the increase in tourists from the USA and Japan. Native species have been depleted on the reefs and this has caused inflated prices; in 1977 a Hawaiian tiger shell cost \$75. In 1976 Exotic Shells, a firm in Hawaii, imported and re-exported shells all over the world, selling primarily to non-scientists, and buying huge quantities and selling by the 100 pound (45 kg) batch. They were also selling 250 lb (114 kg) giant clam shells (Tridacna gigas) from the Philippines, which were used in the USA as wash-basins.
- In Papua New Guinea the shell trade is government controlled, and highly organised. Coastal villages have one man responsible for the collection of the shells, and the quality is strictly regulated. Collecting areas are changed regularly, and only specimens of a certain age and size are allowed to be taken.
- Japan, the USA and Europe are the main consumers, as is the case with most wildlife products. Tropical Sea Shells is a new business recently set up in England, selling at first three tons of shells a week. Prices ranged from 3 cents to \$232, the average price being about \$3, for shells from the Philippines, East Africa and the Seychelles. By the end of 1978 Philippine traders were sending poorer quality shells, which suggests that stocks were being depleted.
- In 1978 Eaton's shell shop in London was offering giant clams at £45-300 (\$80-480) per pair, and tritons at up to £25 (\$40) each pair.
- Few studies have been made on the shell trade and its effect on mollusc populations, but one in Kenya in December 1978 is probably illustrative of the situation in other tropical countries.
- Legislation passed in Kenya in 1968 made it an offence to collect shells without an official permit. Since 1975 collectors have been restricted to taking a maximum of 5 kilograms (11 pounds) of shells at one time.

- In Mombasa in December 1978 two shops and 10 street stalls were selling shells; in Malindi there were eight street stalls, and hawkers were seen on the beaches and at hotels. There was little evidence of any major international trade, although according to the official trade statistics Kenya exported nearly 90 tonnes of coral and shells in 1977.

- All the stalls and shops tend to sell the same selection of shells, mainly the large, colourful, shiny ones attractive to tourists, such as cowries, spider conches, helmet shells and tritons.

- Much of the Kenyan coast was formerly rich in these species, but the main collecting areas are now restricted to the northern and southern extremities of the coast: Kiunga, Lamu and Shimoni. A few years ago lorry and plane loads of shells were to be seen leaving these areas but such large scale collection has apparently ceased. Three marine parks have been established, where it is forbidden to collect shells; although poaching does occur, there is general agreement that shell numbers are higher within the parks than without.

- As yet no species has become extinct as a result of the shell trade. But the popular species are becoming more difficult to find, particularly the helmet shells and tritons, and large specimens of any species are rare. Equally serious is the damage to the reefs caused by collectors, both tourists and Africans; stones are overturned and the animals living underneath are left exposed to the sun.

On the progressive side, pearl farming eases slaughter of wild stocks of pearl oyster, and an enterprising Button Factory in the Sudan, started farming the Black Lip Pearl Shell back in 1959. In our own country, commercial slaughter of Margaritifera margaritifera has been matched by the 'research conservation farming' work by Dr. Young and J. C. Williams at the University of Aberdeen (Conchologists' Newsletter No. 64 March '78).

Wholesale live mollusc gatherers and marketers are entrepreneurs not conchologists. If they take a leaf out of the "Aquarium Fish Trade" book, they will hopefully start hobby farming. If they don't, the caring world will have to start 'Conservation Farming', WHICH IS NOT ALWAYS SUCCESSFUL.

Grant Jesse

WITCOMBE WOOD REVISITED

Witcombe Wood (G.R. SO 9113) is the most easterly of a Series of ancient scarp beechwoods on the Cotswolds above Gloucester, which are collectively an S.S.S.I.

The wood should be known, by name at least, to conchologists, for it was visited by Boycott in the 1920's, and he used the list of slugs and snails found there to typify the fauna of rich calcareous woodland (Boycott 1929 and 1934 - note that he spells it Whitcombe Wood). His collection came from a small area within the wood, and indicated it to be one of the richest sites in the country, containing 37 species.

On May 12th. 1984, I took a party into Witcombe Wood to collect again, both to see how the wood (and its molluscs) has fared half a century later, and also to confirm the presence of segregates not known to Boycott. The weather (and the ground) were dry, and our visit followed a prolonged dry spell, making slugs particularly hard to find.

The wood has suffered some disturbance. Some areas have been felled, and have

either regenerated with Ash, or have been partly interplanted with conifers. We concentrated on four areas, details of which are given below.

Site 1 G.R. SO 915135. Beechwood alongside road on scarp summit, with remains of small quarries. Many big patches of beech litter, some eroding soil and rock, and some patches of Mercurialis perennis. Very dry.

Site 2 G.R. SO 911136. Mixed beech/ash wood with some disturbed areas. Steep slopes with much loose limestone at surface, with leaf litter and a varied flora.

Site 3 G.R. 919137. Mostly ash, with deeper and damper litter than Site 2, and with many fallen branches and logs.

Site 4 G.R. 920141. Disturbed area at bottom of wood, close to boundary with conifer plantation. Brambles, some Mercurialis, some sedges and grass. Probably damp under normal weather conditions.

	Boycott	TOTAL 1984	1	2	3	4
<u>Pomatias elegans</u>	X	X	X	X	X	
<u>Acicula fusca</u>	X	X	X	X	X	
<u>Carychium tridentatum</u>	X	X	X	X	X	X
<u>Cochlicopa lubrica</u>	(X)	X		X	X	X
<u>Cochlicopa lubricella</u>		X	X	X	X	
<u>Abida secale</u>	X	X	X	X	X	
<u>Acanthinula aculeata</u>	X	X	X	X	X	
<u>Ena montana</u>	X	d		d		
<u>Ena obscura</u>	X	X	X	X	X	
<u>Punctum pygmaeum</u>	X	X	X	X	X	
<u>Discus rotundatus</u>	X	X	X	X	X	X
<u>Arion ater</u> agg.	X	X	X	X	X	X
<u>Arion subfuscus</u>	X	X	X	X	X	
<u>Arion silvaticus</u> *	X	X		X	X	
<u>Arion distinctus</u> *	X	X	X	X	X	X
<u>Vitrina pellucida</u>	X	X	X	X	X	
<u>Phenacolimax major</u>		X		X	X	
<u>Vitrea crystallina</u>	(X)	X	X	X	X	X
<u>Vitrea contracta</u>		X	X	X	X	X
<u>Aegopinella pura</u>	X	X	X	X	X	X
<u>Aegopinella nitidula</u>	X	X	X	X	X	X
<u>Oxychilus cellarius</u>	X	X	X	X	X	X
<u>Oxychilus alliarius</u>	X	X	X	X	X	X
<u>Oxychilus helveticus</u>		X	X	X	X	
<u>Milax gagates</u>		X				X
<u>Limax maximus</u>	X	X		X		
<u>Limax cinereoniger</u>	X					
<u>Limax tenellus</u>	X					
<u>Limax marginatus</u>	X	X		X	X	
<u>Deroceras reticulatum</u>	X	X			X	X
<u>Euconulus fulvus</u>	X	X		X	X	X
<u>Cochlodina laminata</u>	X	X		X	X	X
<u>Macrogastra rolpheii</u>	X	X		X	X	
<u>Clausilia bidentata</u>	X	X	X	X	X	
<u>Cernuella virgata</u>		X	X			
<u>Trichia striolata</u>	X	X	X	X	X	X
<u>Trichia hispida</u>	X	X	X	X	X	X
<u>Arianta arbustorum</u>	X	X	X	X	X	
<u>Helicigona lapicida</u>	X	X		X	d	

	Boycott	TOTAL 1984	1	2	3	4
<u>Cepaea nemoralis</u>	X	X	X	X	X	X
<u>Cepaea hortensis</u>	X	X		X		
<u>Helix aspersa</u>	X					
<u>Helix pomatia</u>	X	d		d	d	

43 species

Brackets indicate aggregates. d = dead shells only, not fresh.

*Arion circumscriptus and hortensis recorded by Boycott.

Each site was searched for about half an hour and bags of soil and litter were brought back to the laboratory for sorting. The table shows the distribution of finds, and a comparison of the list with that of Boycott. Site 4 is conspicuously the poorest (and most disturbed), and sites 2 and 3 are very rich.

We failed to find any traces of three species recorded by Boycott: Limax cinereoniger and L. tenellus are probably accounted for by time of year and weather, leaving Helix aspersa unaccounted for. We also failed to find fresh specimens of Ena montana and Helix pomatia, but other recent records nearby suggest that both probably still survive in the Wood (D. C. Long, personal communication).

To compensate, we found some species not recorded by Boycott. Cochlicopa lubricella and Vitrea contracta were entirely expected, being unrecognized in Boycott's day. The others are Phenacolimax major, Oxychilus helveticus, Milax gagates and Cernuella virgata. The last two are probably accidentals - the first found only in site 4, quite close to farmland, and the last (a dead, but fresh shell) near the road. Phenacolimax could easily have been missed (we found only one live adult). Oxychilus helveticus is more surprising. Many live specimens were found in the wood, and it was commoner than O. alliarius.

In all, therefore, 43 species have been recorded from this wood, which remains one of the richest studied. Boycott suggested that a number of species he did not find were merely overlooked, and so it is worth recording that even with 10 people searching, over larger areas, and with large amounts of litter sorted, we also failed to find Nesovitrea hammonis, Lauria cylindracea and Columella edentula.

Witcombe Wood appears to lack other species for which its dryness is probably responsible. In neighbouring Cranham Wood, which has springs and Alders, D.C. Long (1969) recorded Carychium minimum, Azeca goodalli, Columella edentula, Vertigo substriata, Leiostyla anglica, Zenobella subrufescens, Arion intermedius, Nesovitrea hammonis and Deroceras laeve. Lauria cylindracea also occurs on walls and rocks in neighbouring woods, giving a grand total for this woodland complex of 53 species at least.

I should like to thank Mr. M. Hicks Beach for permission to visit and collect in Witcombe Wood, Mrs. Ruth Briggs of the N.C.C. for information about the site and clearance to collect in an SSSI, and Mr. D. C. Long for his records and information on the molluscs of the area.

References

- Boycott, A.E., 1929. The oecology of British Land Mollusca, with special reference to those of ill-defined habitat. Proceedings of the malacological Society of London 18: 213-224.
- Boycott, A.E., 1934. The habitats of land Mollusca in Britain. Journal of Ecology. 22, 1-38.
- Long, D.C., 1969. A small bog in Cranham Wood. Conchologists' Newsletter 30, 111-113.

Robert Cameron

SHELLS FROM THE SKY

On 22 March 1983 several national newspapers reported that marine shells had fallen at Dilhorne, about 10 km east of Stoke-on-Trent, Staffordshire. This event was doubly intriguing to me, since my interests include both conchology and meteorology. Over the years there have been many reports of showers of unusual objects, particularly fish and frogs. Some of these showers are dubious, especially the frog showers, which in many cases are only swarms of young frogs that have emerged from the vegetation after rain. In a good many of the incidents, however, (including one or two of the frog showers) the objects or creatures were actually seen to fall. The only possible explanation is that a tornado or other whirlwind had sucked them up and then dissipated, dropping its load. Indeed, I have come across several eye-witness accounts of this happening, in the course of collecting material for the Tornado Research Organisation's archives (together with Dr. Terence Meaden).

Several tornadoes occurred in Britain on the same day as the alleged shell-fall, so it seemed that one of them had picked up the shells and dropped them on Dilhorne. However, Dilhorne is 75 km from the nearest sea, and no tornado has a track as long as that, so it was important that the shells should be identified. Mr. P. J. Swinhoe was researching the events of 21 March in Staffordshire for an article in the Journal of Meteorology. In this he reported: "Roy Wilson and his wife, of Godley Lane, Dilhorne, went outside to find the ground covered with tiny shells. They extended for an area of about 50 by 20 metres and occurred in thousands on lawns, flower beds, paths and even the road" (Swinhoe, 1983). Mr. Swinhoe sent some of the shells to Mr. C. J. T. Copp of the Natural History Department, Bristol Museum. He identified them as Pyrene (Columbellidae), most likely from the Philippines. Pyrene is imported into Britain in large quantities for craft-work, but how large numbers of these shells ended up in the gardens of Dilhorne is likely to remain a mystery.

Several other showers of shells are on record. Kew (1893, p.44) mentions a shower of "hundreds" of Anodonta anatina (L.) which fell at Paderborn, West Germany, on 9 August 1892, during a thunderstorm. In 1821 a shower of Cernuella virgata (da Costa) was widely reported as having fallen at Tockington near Bristol. The report was generally received with ridicule, which is not surprising when we are told "that the earth's surface was covered near six acres, three inches deep" (Felix Farley's Bristol Journal). This seems a clear case of a swarm of C. virgata emerging after rain. Parts of Tockington are underlain by Carboniferous Limestone, on which this species is often abundant. A shower of snails at Redruth, Cornwall, on 9 August 1886, is likely to have the same explanation as the Tockington shower.

Finally there is the very puzzling shower of periwinkles - presumably Littorina littorea (L.) - at Worcester in May 1881. Since this was reported in the local press at the time, naming witnesses who had seen the winkles fall, a hoax seems unlikely. Yet a tornado could not possibly carry marine molluscs as far inland as Worcester. I had wondered whether the 'Littorina' might have been Pomatias elegans (Müller) from the Cotswolds, but this is impossible - a living hermit crab was found in one of the shells (although this does sound just a little too good to be true).

If any member has knowledge of any other shell-showers, or for that matter has seen a whirlwind or waterspout in Britain, I would be very pleased to hear from them.

References

Kew, H.W. (1893). The Dispersal of Shells. London.

Swinhoe, P.J. (1983). Unusual events along the squally cold front of 21 March 1983. J. Meteorology (U.K.), 8:233-238.

M. W. Rowe, [REDACTED], Holbury, Southampton

PUBLICATIONS RECEIVED

Note. All items mentioned will be held by T. E. Crowley for three months after issue of this Newsletter, so that any members who wish may borrow them during this period.

Porcupine Newsletter, Vol. 2, No. 10, March 1984

(Frank Evans, Editor, Dove Marine Laboratory, Cullercoats, North Shields, NE30 4PZ)

Principal contents includes 'History of Benthos Sampling' by N. A. Holme; 'Co-ordination of Geological and Biological Sampling on the Porcupine Bank' by G. Bowes, T. Scoffin and Shelagh Smith; 'Sampling the deep-sea demersal fish of the Rockall Trough' by J. D. M. Gordon; 'Sampling deep-sea Invertebrates in the Rockall Trough' by R. Harvey; 'Coring for Meiofauna' by P. Barnett and J. Watson; 'Observing the Benthos on the Continental Shelf using Television and Photography' by J. B. Wilson; 'New Bottom Sampler for Offshore benthic monitoring' by P. F. Kingston and N. Lunan; a description of the CERL Marine Biological Laboratory at Fawley; together with meeting reports, correspondence, reviews and notes.

Oxfordshire Museums, Occasional Paper No. 6; 'An Atlas of Oxfordshire Freshwater Molluscs' by T. E. Crowley and J. M. Campbell.

(Published by Oxfordshire C.C. Dept. of Museum Services, Fletcher's House, Woodstock, Oxon, OX7 1JH - £2.05 post paid)

This is of course, an interim report. It is based on tetrads but superimposed on the results of the National Survey, which gives some indication of the work yet to be done. Each species is mapped, with comments, and there is a full bibliography. One motive in deciding to publish now is of course, the hope of stimulating wider interest.

Opisthobranch, Vol. 16, No. 4 (April 1984)

Published by Steven J. Long and Sally Bennett, 505 E. Pasadena, Phoenix, AZ 85012-1518, U.S.A.

This number contains a short review of the genus Simnia Risso, an article on sea slugs entitled 'Beginner's Luck' by Malcolm Edwards, and one by Hans Bertsch on symbiosis of Pecten and Capulus. There are personal notes, some from very well-known malacologists, classification notes on the Patellaceae, and an informative article, illustrated in colour, on 'Lamellariids: Masters of Disguise' by David W. Behrens.

Porcupine Newsletter, Vol. 3, No. 1, July 1984: and membership list.

Main contents: 'Estuarine and Coastal Benthic Studies carried out by the Scottish River Purification Boards' by Mike Elliott; 'Aims and Methods for Systematic Survey by Divers of sublittoral rocky areas' by Keith Hiscock; a description of the Port Erin Marine Biological Laboratory; an obituary of Sir Frederick Russell; 'Giant Squid stranded at Aberdeen' by Peter Boyle; 'Records from the Haven, Newton-by-the-Sea, Northumberland' by Judy Foster-Smith; and 'An ovigerous Female of Bathynectes longipes on the west coast of Ireland' by David W. Connor.

T. E. Crowley

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 974th. (Annual General) Meeting held on 17th. March 1984 at B.M.(N.H.)

In the Chair: Mr. A. Norris with 54 members and friends present.

Appointment of Scrutineers: Mrs. Pain and Mr. Worth agreed to serve as scrutineers again this year, and were so appointed.

Nominations and Elections: 1 full member and 1 junior member
Walton, R.B., [REDACTED], Cott Road, Lostwithiel, Cornwall, [REDACTED]
Junior member Gregory, Miss S.A., [REDACTED], Lower Peover,
Nr. Knutsford, Cheshire, [REDACTED]

Report of the Council 1983/4: read by the Hon. Secretary and accepted.

Report of the Accounts 1983/4: Copies of the Accounts were circulated and the report was read by the Hon. Treasurer; both were accepted.

Report of the Non-Marine Recorder: read and accepted.

Report of the Marine Recorder & Report of the Hon. Junior Members Officer were not read as these Officers were not present at the Meeting.

Report of the Hon. Field Meetings Officer: read and accepted.

Results of the Postal Ballot: It was announced that the following members had been elected to serve on the Council: Mr. J. Fryer, Mrs. E. B. Rands, Miss E. Fogan, Mr. D. Long and Miss M. Seddon. As previously agreed, this would also mean that Miss Seddon will be resigning after 1 year and Mr. Long after 2 years service.

Election of Auditors: Dr. Lloyd Evans and Mr. Edwards have agreed to continue as auditors and this was confirmed by the Meeting.

Presidential Address: 'The Mollusca of Yorkshire - a Historical Review'

Any other business: A number of stamps were auctioned for the benefit of the Society's funds.

The Meeting closed at 5.15 p.m.

Members Exhibits

- | | |
|-----------------|---|
| W. B. Backhuys | - Letters of famous malacologists |
| G. Osborn | - Shells in sand |
| C. J. Chibnall | - Shells of the genus <u>Distortio</u> |
| D. C. Long | - Mid to late Pliocene gastropods and pelecypods from Cyprus |
| B. Colville | - Coloured illustrations of the land snails of Japan by Masao Azuma |
| G. W. Pitchford | - Marine shells from Helford Passage, Cornwall
<u>Callista chione</u> (Linne 1758) from Amsterdam Point, Cornwall.
R.S. Forster, Legit.
European Non-Marine shells |
| E. Sándor | - Family Muricidae Rafinesque, 1815 - The Winged Murex shells |
| M. Mitchell | - Family Fissurellidae Fleming 1822
Subfamily Diodorinae Odhner 1932 &
Subfamily Fissurellinae Fleming 1822 |
| A. P. H. Oliver | - Volutes The genera <u>Cymbium</u> and <u>Ampulla</u> |
| G. H. Cox | - Shells rarely seen |
| S. Harrison | - Mollusca from the Gambia and New Zealand |

- | | |
|------------|---|
| T. Pain | - Buccinidae of Sea Area 10 Dogger |
| A. Norris | - Miscellaneous Books, etc. on Yorkshire Mollusca |
| J. D. Nunn | - Information for members of the Society and stamps for auction |

The 975th. (Ordinary) Meeting held on 14th. April 1984 at B.M. (N.H.)

In the Chair: Mr. A. Norris with 31 members and friends present.

Death of a Member: The death of Mr. A. P. H. Oliver was announced.

Nominations and Elections: 1 full member

Kuyper, Mr. W.J., Holbeekstraat 12, 2203 HB Noordwyk, The Netherlands

Lecture: 'Shell Photography' by Mr. D. Rands

Announcements and Correspondence: Mr. Pain announced that the British Shell Collectors Club would be holding its annual Shell Show on Saturday 28th. April in Napier Hall, Hide Place in Pimlico - open to the public between 1 p.m. and 5 p.m. Mr. Pain also announced that all the details of the forthcoming Field Meetings would be in the June Newsletter.

Mrs. Rands announced that due to public demand, she would be ordering plastic boxes. Any member wishing to order should sign the list available.

The meeting closed at 4.57 p.m.

Members Exhibits

- | | |
|--------------------|---|
| M. Mitchell | - Small South African Shells
Family Tridacnidae |
| D. C. Long | - Photographs of Australian and Cypriot land molluscs |
| J. Llewellyn Jones | - British Freshwater Molluscs |
| T. Pain | - 'Murex' in the Mediterranean |
| D. Rands | - Shell Photography |

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

c/o. British Museum (Natural History), Cromwell Road, London, SW7 5BD

ITZN 11/5 A.N.(S.) 131

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the Bulletin of Zoological Nomenclature, volume 41, part 3, on 23 August 1984 and would welcome comments and advice on them from interested zoologists.

Correspondence should be addressed to the Secretary at the above address, if possible within six months of the date of publication of this notice.

Case No.

- 2476 Request for a declaration clarifying the meaning of the expressions 'Suppressed for nomenclatural purposes', 'Rejected for nomenclatural purposes' and the status of information in works that are rejected under Articles 8 and 9 of the Code.
- 2477 A proposed amendment of Article 70b of the International Code of Zoological Nomenclature on misidentified type species.
- 2237 Williamia Monterosato, 1884 (Mollusca, Gastropoda): proposed conservation.

R. V. Melville, Secretary

GENERAL NOTES

NOTES ON HISTORICAL CONCHOLOGY 2

S. P. Woodward (1821-1865)

Woodward, author of A manual of the Mollusca, was the first Professor of Natural History at the Royal Agricultural College between 1845-1847, before taking up his appointment at the British Museum. The College still retains (1982) his considerable herbarium. However, the drawings which accompanied it (Desmond, R. 1977 Dictionary of British and Irish Botanists) appear not to be present. The only conchological item held by the College is a copy of the 4th. edition of the Manual; there are no specimens or archives and it is not known if any were even left at the College.

Joseph Dandridge (1664-1746)

Dandridge is generally considered an entomologist, however, it appears that he had a considerable natural history collection which included shells (Bristowe, W.S., 1967, The Life and Work of a Great English Naturalist, Joseph Dandridge 1664-1746. Entomologists Gazette 18: 73-89). Da Costa, many years later described this as a fine collection (Da Costa, M., 1812, Notices and anecdotes of literati collectors, etc., Gentleman's Magazine 82 (1) 204-207, 513-517). The present location of the shell specimens would initially appear to be of passing interest because Dandridge himself did not publish anything on any aspect of natural history. Bristowe, however, shows, in fact, that Dandridge improved arachnid systematics and significantly increased the number of recorded British species. However, virtually the only evidence for this is in Eleazor Albin's Natural History of Spiders and other curious Insects which uses Dandridge's own notes and illustrations almost unaltered and without any acknowledgement. Is it possible that any work that Dandridge may have done on his shell collection was similarly plagiarised? If so, it may be possible to learn more of both it and the man that amassed it.

(from Peter Lingwood)

EXTRACTS

"Animal Ecology in Tropical Africa", by D. F. Owen, Longmans, 1976, 2nd. edition. Chapter 3, p. 62.

"The open-billed stork, Anastomus lamelligerus feeds mainly on the large amphibious snail, Pila ovata, but is also reported as eating a variety of other molluscs including Limicolaria martensiana (Kahl 1971). Pila ovata becomes particularly abundant in wallows created by the hippopotamus especially if, as is often the case, a floating plant, the water cabbage, Pistia stratiotes, covers the surface of the water. The size of a wallow depends on its age, and the number of hippopotami using it. Big wallows can be completely covered by Pistia, which in turn supports a large population of Pila ovata. The storks become concentrated at wallows and feed on the snails, often using the back of a wallowing hippopotamus as a perch from which they can catch the snails."

p. 66.

"Biomphalaria sudanica, an African aquatic snail, releases a substance that appears to inhibit growth in other snails in the same population (Bernie and Visser 1963). In this species maturation occurs only when the snails reach a certain size, and so breeding is delayed at high population densities."

Chapter 5, p. 92.

"Aestivation is normally confined to dry periods, but curiously enough there are nearly always a few snails in most populations in 'aestivation' even during the wet

season. The significance of this is not known. Howes and Wells (1934) discussing water relations of snails and slugs in temperate regions, suggest there is a tendency on the part of individuals for phases of aestivation to alternate with phases of activity even under approximately constant environmental conditions. They suggest a natural hydration cycle in the animals themselves. If this is so in the African Achatinidae, some of which burrow into the ground before secreting an epiphragm, catastrophic events such as grass fires, which destroy great numbers of snails, would spare aestivating individuals. In species that feed on crops such as the giant snail Achatina fulica, most attempts at mass destruction would still leave aestivating individuals alive and the population could thus regenerate."

Chapter 6, p. 105.

"It is now realised that many species are much more variable than was previously thought. Thus in the land snail genus Limicolaria about 170 species have been described for Africa, mostly based upon differences in the colour and the pattern of the shell. It is known that the snails in this genus are highly variable and polymorphic, and it is likely that once populations have been thoroughly investigated it will be found that there are no more than about a dozen species in tropical Africa. Variation in Limicolaria results from adaption to local environments, and from the effects of isolation between colonies."

(from Betty M. Smith)

GLEANINGS FROM THE FIELD

9.11.1889 Gigantic squid

On the little strand at Dufort, in Achil Island, on the west coast of Mayo, now lie the remains of a gigantic squid. It was stranded for some months on one of the reefs at the entrance of Blacksoch Bay, and caught on the Dufort Strand by the late gale of Oct. 4, which swept over the western ocean with great fury. This animal is of such rare occurrence on our shores, that it should not go unrecorded. The species is uncertain, as it was much decayed, and shorn of its beauty. The suckers and horny rings had fallen off before it reached the Strand; and also the parrot-like horny beak, peculiar to this animal was also missing. Though shrunk and distorted, it measured as follows: length of tentacles or long arms, 30 ft. each; circumference of tentacles in some places, 4 ft. round; body, including short tentacles, over 60 ft. This is the third recorded appearance of a large squid on the west coast of Ireland. One was stranded on the shores of Kerry more than two centuries ago; and another was found off Boffin, Co. Mayo, and recorded and identified by the gifted naturalist Mr. A. G. More, of Dublin, who rescued portions of it, including the parrot-like beak so peculiar to this animal, which may now be seen in the Dublin Museum. A very faint idea can be gathered from what is preserved of this most curious creature, as it shrivels away almost to nothing except a large cartilaginous pen, which runs across the body and branches off to the short arms. Curious tales are often told by mariners about this animal, its enormous arms or tentacles armed as they are with formidable suckers and horny rings which are set with small teeth pointing inwards. It is not impossible that, as its long arms toss about in the great ocean over 70 ft. in length it may have given rise to the idea that there is such an animal as a sea serpent.

J. R. Sheridan (Dufort, Achil Isle, Co. Mayo) The Field, Vol. 74, No. 1924, p. 667-8

RETREAT FROM THE SNAIL

The following amusing quotation comes from an article by David A. Bender on water quality in the Newsletter of The Selborne Society (No. 39), published at Greenford, Middlesex.

Referring to water in the tropics:

"Even when you find water, and know that you have to boil it before drinking because of the contamination with faecal bacteria, it is not safe to swim in. Bilharzia is a particularly unpleasant disease caused by a parasite carried by snails, and reaches almost 100% incidence in some parts of Africa. I don't mind swimming away from crocodiles while I take my bath, but to run away from a snail is somehow shameful!"

(from June Chatfield)

EXCHANGE WANTED

Werner Reiske, [REDACTED], 1407 Lehnitz, German Democratic Republic, would like to exchange land and freshwater shells of central Europe for tropical land shells, in particular he would like Achatina, Columna, Strophocheilus, etc. Also literature.

DIETER SCHIERENBERG BV, Prinsengracht 485-487, 1016 HP Amsterdam, The Netherlands, specialise in Malacological journals and rare books. Please ask for specialised catalogues and offer us your set of Journal of Conchology.

CHRISTMAS 1984 and the NEWSLETTER IN 1985

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

I am grateful to all the people who have sent in articles, reports and news items during the current year. In 1985, I should particularly like to have a few articles on the ever popular tropical marine molluscs, if possible with one or two line drawings. I know there are many readers interested in these exotic shells, so how about writing something and sharing your experiences and knowledge with all the others? Somehow the non-marine people seem more inclined to put pen to paper, but it would be nice to keep a balance between all types of molluscs.

P. E. Negus

MARINE RECORDING - AREA REPRESENTATIVE CHANGES

The following changes in Area Representatives have taken place:

- S 1 SHETLAND Dr. J. D. Peacock has resigned and Mr. A. Skene has agreed to act for it as well as for his existing area S 3 Orkney.
- S 10 DOGGER Mr. J. Llewellyn-Jones has handed over to Mr. T. Pain of [REDACTED], Millbank, London, [REDACTED]
- S 14 EAST CHANNEL Mrs. C. J. Pain has resigned and the Area will be represented by the previous Marine Recorder, Mr. C. P. Palmer, [REDACTED], [REDACTED], Grange Road, Sutton, Surrey, [REDACTED]

I thank the retiring representatives for their efforts, help and advice, particularly in the Atlas preparation, and am glad that their areas will remain in good hands.

- S 29a ANTRIM Mr. M. Brisco has moved to a new address: c/o. John Innes Institute, Colney Lane, Norwich.
- S 16 PORTLAND and MARINE RECORDER I also have moved and correspondence should be addressed to: [REDACTED], Chetnole, Sherborne, Dorset, [REDACTED]

D. R. Seaward, Marine Recorder

Duplicated by: SPEEDWELL PRESS, 10 Trap Road, Guilden Morden, Royston, Herts.

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THE TURN OF THE SQUID

The British have always been remarkably conservative in their eating habits compared with mainland Europeans; and the latter are less catholic in their tastes than most people in the Far East. However we are becoming increasingly cosmopolitan in what we eat and how we prepare it, both as a result of more travel and the presence of many ethnic groups with their own restaurants. We still eat only a small proportion of the mollusc species that are deemed edible on the Continent, and until very recently, cephalopods were virtually absent from the British menu except in shops specialising in Mediterranean food, as for example in Soho where even in the 1950s cephalopods could be bought fresh, dried or tinned. The turn of the octopuses and cuttles may yet arrive; that of the squids is already with us. A couple of decades ago, squids were not included in Ministry returns, but since 1961 such returns have been made at all the major ports; up to that year, it was very rarely used except as bait by anglers and for long-lines, fetching about 2/6d (12.5p) a stone. In the early 1970s, the value of squid started to rise rapidly, and it is now worth at least £10 a stone, and although it is mainly exported, some can be seen in our local fish-shops in Cornwall, and doubtless in most parts of the U.K.

Unquestionably, the Cephalopoda includes the brainiest of all the invertebrates, being quick to learn and fast to act on their knowledge. This, together with their ability to move backwards as readily as forwards, and their use of ink-clouds to confuse predators, makes them extremely difficult to catch. Until very recently, they were not specifically 'fished' off the British coast, but formed 1 - 2% of catches in trawl or seine nets. In Japan, by contrast, there is a thriving squid fishery, for of the world-catch of 1.5 million tonnes, the Japanese are reckoned to consume half; in Europe, the Spanish are the greatest consumers, and they are seventh on the world list! 37,000 Japanese boats are employed in the fishery, most being coastal, but a few travelling as far as New Zealand and Argentina. There are signs that their favourite species, Todarodes pacificus, is being over-fished although the resources of squid-meat as a whole are believed to be vast and in excess of all conventional fish supplies.

The Japanese have been eating squid for over 1,000 years, so necessarily they have perfected methods of catching them. The charcoal lights that were formerly used, have been replaced by powerful electric beams which are believed to attract the squids in the first instance. They are then enticed to seize the jigs, each consisting of a circlet of hooks, the shaft of which may be brightly coloured, feathered or even shaped like a shrimp! In the old days, Japanese fishermen caught squid individually, but now they may use as many as 50 jigs to a line, and where permanent nets are used for mixed fish catches, the nets may be fitted with radar so that the fishermen need not leave the comfort of their homes until the nets are suitably full. It may be some time before such sophisticated methods as these are employed, but jigging with lights is certainly now being used off parts of the west coast, especially here in Cornwall.

If squids are to be fished commercially on a much larger scale than at present, marine scientists say that it is essential that we learn more about their physiology than we know at present. They have evolved to produce their own solution to the problem of food supply and assimilation in an incredibly efficient way. Food is converted to squid-flesh at a very fast rate, and their body-growth is keyed to produce spawn as soon as they are mature; and immediately after spawning, they die. Unless we understand the life-histories and seasonal variations related to breeding and migratory movements of the different species, we could be in danger of over-exploitation as has happened so many times in the past with various animals, in various ways, in various parts of the world. There is another aspect, namely the place that squids have in food chains without the intervention of man as the major predator. It has been estimated that the Sperm Whale alone takes 100 million tonnes a year, and the total landing of conventional fish stocks are thought not to exceed 70 million tonnes. If we overfish, we could be affecting other creatures in ways which may not be immediately apparent or predictable.

Observations concerning the species that are being caught on various parts of the coast would be very useful, so opportunities for identification should be taken whenever possible. Squids receive scant attention in most books on mollusc identification, but detailed drawings and notes were prepared by Dr. B. J. Muus who prepared keys to all the cephalopods of European seas. Anyone wishing to learn more about the general background of the cephalopods, could not do better than obtain a copy of Frank Lane's The kingdom of the octopus.

Sources

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Stella M. Turk

CEPHALOPODA KEYS

(By B. J. Muus) 1963

CEPHALOPODA IN THE NORTH ATLANTIC¹⁾

- | | |
|---|--------------------------|
| 1. Eight sessile arms and two tentacles. Suckers stalky with chitinous armature. Fins present..... | DECAPODA....2 |
| Eight arms. Suckers not stalky and without chitinous armature. Fins absent or present..... | OCTOPODA ²⁾ |
| 2. Body either broad and flattened with long and narrow lateral fins, the internal shell being a voluminous calcified structure or the body is saccular with rounded posterior end and circular lateral fins, the internal shell being chitinous..... | SEPIOIDEA |
| Body torpedo-shaped or saccular. Terminal or subterminal fins..... | TEUTHOIDEA ³⁾ |

1) Comprises the region N of 40°N Lat. 2) See Sheet No. 98. 3) See Sheets Nos. 95-97.

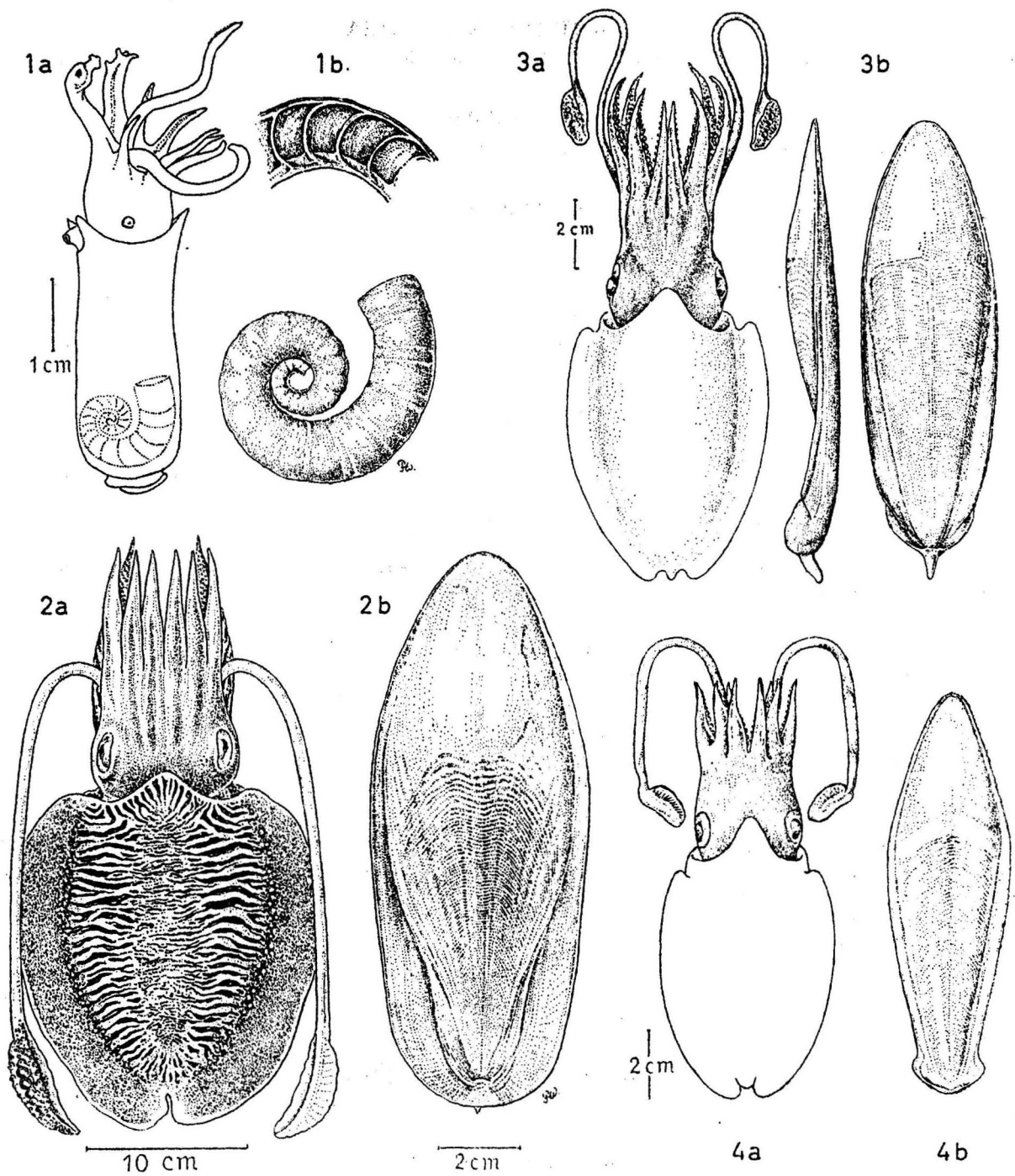


PLATE I

Adult specimens and inner shell of: 1. *Spirula spirula*. — 2. *Sepia officinalis*. — 3. *S. orbignyana*. — 4. *S. elegans* (Figs. 3a, b and 4a, b from ADAM; remainder original).

SUB-ORDER: SEPIOIDEA

Usually four rows of globular suckers on the arms. The club of the tentacles with eight rows of suckers.

Family Spirulidae (Plate I)

Inner shell calcified and coiled. The body is cylindrical with terminal, semicircular fins.

Genus SPIRULA Lamarck

Characters as family. One species.

1. *Spirula spirula* (Linné). The gasfilled shell may also be found drifting.

Family Sepiidae (Plate I)

Inner shell is an oval calcified body lighter than water. Body flattened, flanked by narrow fins which never join posteriorly. Left ventral arm of the male hectocotylized.

Genus SEPIA Linné

Surface of the mantle without conspicuous glandular pores. The shell has no expansions posteriorly.

2. *Sepia officinalis* Linné. The mantle projects in an obtuse angle behind the head. Shell with almost parallel sides. Max. dorsal mantle length 400 mm.
3. *S. orbignyana* Ferussac. The mantle projects in an acute angle behind the head. Suckers in four rows on the arms. Shell with a conspicuous apical spine. Max. dorsal mantle length 100 mm.
4. *S. elegans* D'Orbigny. Mantle projects in an acute angle behind the head. Suckers in two rows on the arms. Shell slender, with a small apical spine. Max. dorsal mantle length 80 mm.

Family Sepiolidae (Plate II)

Inner shell chitinous and rudimentary. Body saccular with rounded posterior end and lateral well separated circular fins. Left dorsal or both dorsal arms hectocotylized.

Sub-family Rossiinae

Mantle edge free. Arms not connected by a membrane reaching half their length.

Genus ROSSIA Owen

Arms with four rows of suckers.

5. *Rossia macrosoma* (Delle Chiaje). Skin smooth. Proximal parts of the arms with two, rest of the arm with four sometimes irregular rows of suckers. Max. ventral mantle length about 60 mm.

Genus ALLOROSSIA Grime:

Arms with two rows of suckers.

6. *Allorossia glaucopsis* Lovén. Dorsal part of head and mantle with small whitish papillae. Normally two rows of suckers, locally three or four rows dependent on state of contraction of the arms. Max. ventral mantle length 40 mm.

Sub-family Heteroteuthinae

Dorsal mantle edge free or fused with the head. Half the length of the arms connected by a membrane.

Genus HETEROTEUTHIS Gray

The fins are placed subterminally. Dorsal mantle edge free, ventrally the mantle projects and covers most of the head. The two right dorsal arms hectocotylized.

7. *Heteroteuthis dispar* Gray. Two dorsal pairs of arms more delicate and shorter than the rest. Max. ventral mantle length 20 mm.

Sub-family Sepiolinae

Dorsally the mantle edge is fused with the head. Only the dorsal or ventral arms might be connected part of their length by a membrane.

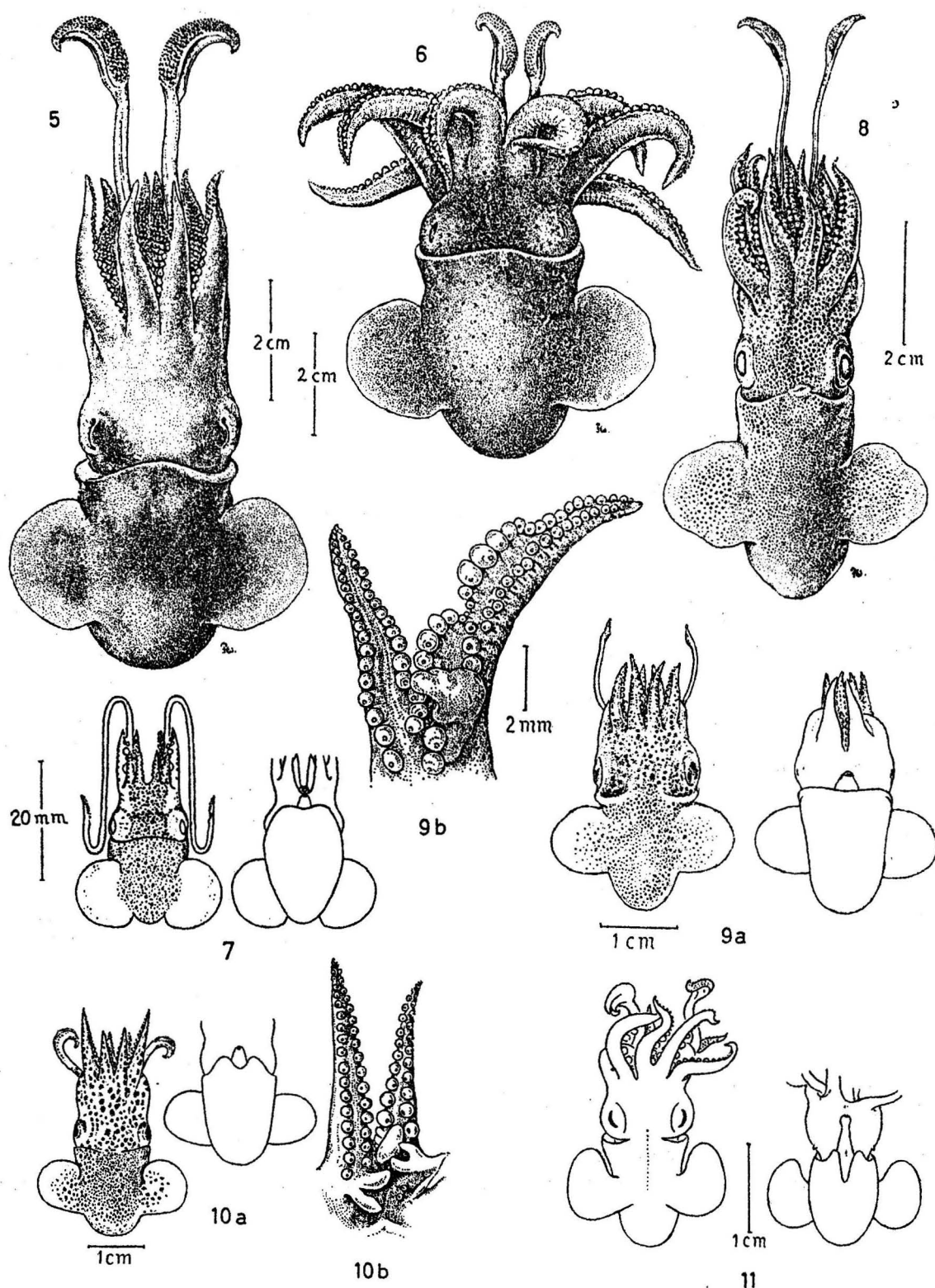


PLATE II

5. *Rossia macrosoma*. — 6. *Allorossia glaucopis*. — 7. *Heteroteuthis dispar*; dorsal and ventral view. — 8. *Sepietta oweniana*. — 9. *Sepiola atlantica*; a, dorsal and ventral view; b, hectocotylus. — 10. *S. aurantiaca*; a, dorsal and ventral view; b, hectocotylus. — 11. *S. psafferi*; dorsal and ventral view. (Figs. 7 and 10a, b from NAEF; Fig. 11 from GRIMPE; remainder original).

Genus SEPIETTA Naef

The dorsal arms proximally connected by a membrane, the cleft between them being less deep than between the other arms. Tentacles with 16-32 longitudinal rows of very small suckers.

8. *Sepietta oweniana* (D'Orbigny). Body longer and more slender than *Sepiolo*. Left dorsal arm hectocotylized. Max. ventral mantle length 50 mm.

Genus SEPIOLA Naef

Dorsal armpair not connected proximally by a membrane. Tentacles with 8 longitudinal rows of suckers.

9. *Sepiolo* (*Heterosepiolo*) *atlantica* D'Orbigny. Distal parts of ventral arms with 4-8 rows of suckers. Left dorsal arm hectocotylized. Max. ventral mantle length 21 mm.
10. *S.* (*Hemisepiolo*) *aurantiaca* Jatta. All arms with two rows of suckers. Ventral mantle edge with a u-formed cut round the funnel. Both dorsal arms hectocotylized. Max. ventral mantle length 15 mm.
11. *S.* (*Hemisepiolo*) *pfefferi* Grimpe. All arms with two rows of suckers. Ventral mantle edge with a deep v-formed incision. Only left dorsal arm hectocotylized. Max. ventral mantle length 13 mm.

Further Information on Identification

1. *Spirula spirula*: NAEF, 1923, p. 506, Textfigs. 276-81.
2. *Sepia officinalis*: ADAM, 1941, p. 84. JAECKEL, 1958, p. 568. NAEF, 1923, p. 547, Textfigs. 302-09.
3. *S. orbignyana*: ADAM, 1952, p. 28, Textfig. 9, Pl. II, Figs. 1-3. JAECKEL, 1958, p. 570, Fig. 44. NAEF, 1923, p. 555, Textfigs. 310-14.
4. *S. elegans*: ADAM, 1952, p. 22, Textfig. 7, Pl. III, Figs. 1,2. JAECKEL, 1958, p. 570, Fig. 45. NAEF, 1923, p. 560, Textfigs. 315-20.
5. *Rossia macrosoma*: JAECKEL, 1958, p. 571, Fig. 46. NAEF, 1923, p. 590, Textfigs. 338-340.
6. *Allorossia glaucopsis*: JAECKEL, 1958, p. 573, Figs. 47, 48.
7. *Heteroteuthis dispar*: NAEF, 1923, p. 595, Textfigs. 341, 342, Pl. VIII, Figs. 1-6; Pl. XIX, Fig. 10.
8. *Sepietta oweniana*: JAECKEL, 1958, p. 578, Fig. 51. NAEF, 1923, p. 645, Textfigs. 379-381.
9. *Sepiolo* (*Heterosepiolo*) *atlantica*: JAECKEL, 1958, p. 575, Fig. 49.
10. *S.* (*Hemisepiolo*) *aurantiaca*: JAECKEL, 1958, p. 577. NAEF, 1923, p. 612, Textfigs. 357-360.
11. *S.* (*Hemisepiolo*) *pfefferi*: GRIMPE, 1925, p. 19, Textfig. 7, Pl. Fig. 5.

Distribution

Species
(Species in brackets occur only exceptionally)

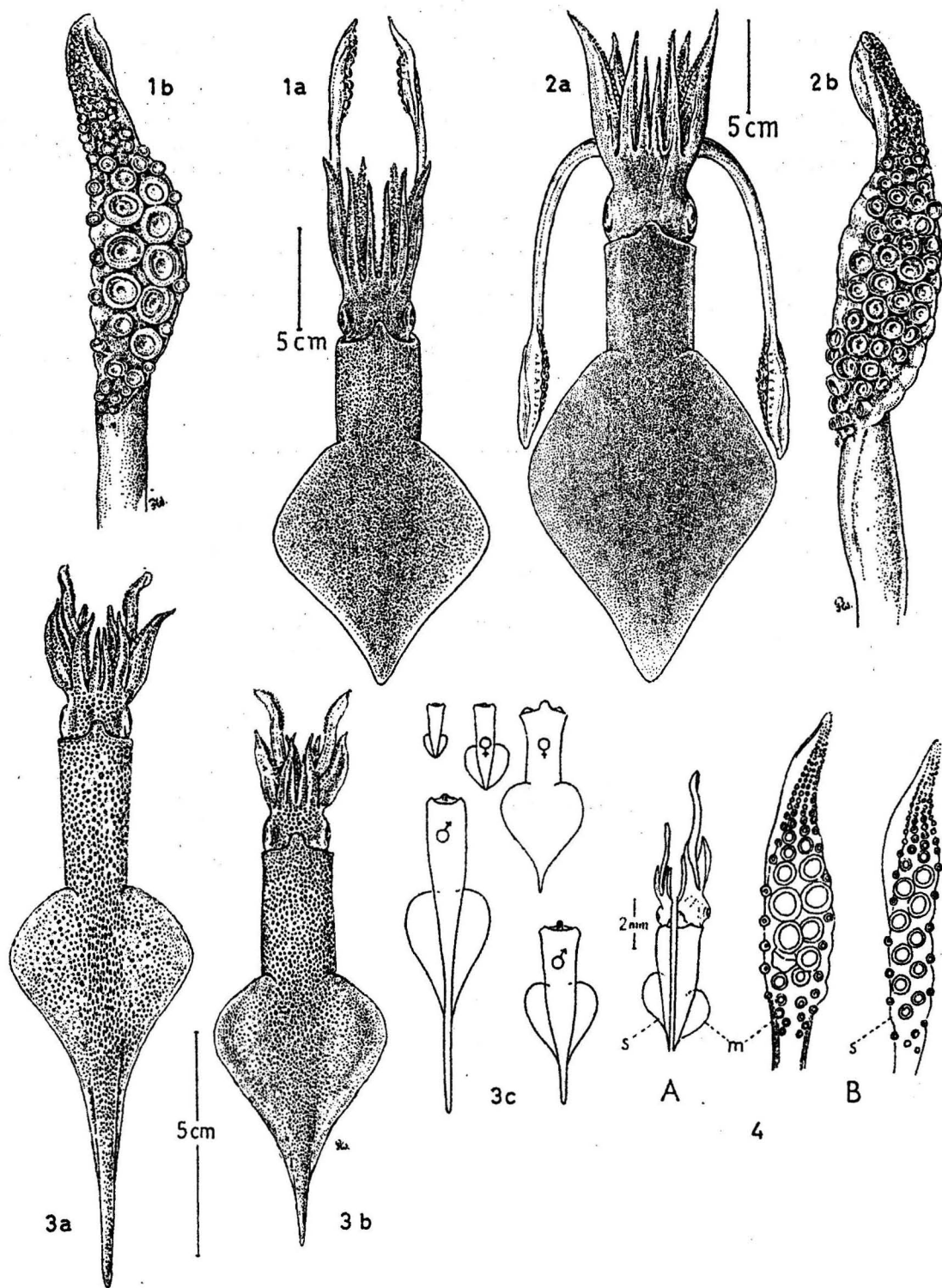
Gulf of Bothnia.....	—
Gulf of Finland.....	—
Baltic proper.....	—
Belt Sea.....	8, 9
Kattegat.....	(2), (5), (6), 8, 9
Skagerak.....	(2), 5, 6, 8, 9, (11)
Northern North Sea.....	(2), (3), (4), 5, 6, 8, 9, 11
Southern North Sea.....	2, (3), (4), (5), (8), 9
English Channel (eastern)...	2, 3, 4, (5), (8), 9
English Channel (western) ..	2, 3, 4, 5, 8, 9, 10
Bristol Channel and Irish Sea	2, 3, 4, 5, 7, 8, 9
South and West Ireland and Atlantic	(1), 2, 3, 4, 5, 6, 7, 8, 9, 10, ?, 11
Faroe-Shetland Area.....	(1), 5, 6, 8, 9, 11
Faroe-Iceland Area.....	(1), 5, 6, 8, 9
Norwegian Sea.....	5, 6, 8, 9
Barents Sea.....	6

References to Work on Biology

are so few and scattered that they have been disregarded for this sheet except for species 1, 2 and 5. BRUUN (1943) 1. RACOVITZA (1894) 5. TINBERGEN (1939) 2.

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- | | |
|---|---|
| <p>ADAM, W., 1941. Rés. Sci. Crois. Navire-École "Mercator", III, Mém. Mus. Hist. nat. Belg., sér. 2, fasc. 21: 83-162.</p> <p>— 1952. Rés. Sci. Exp. Océan. Belge Atlant. Sud, 3 (3): 123-93.</p> <p>BRUUN, A. F., 1943. Dana-Report, 4, 24: 1-44.</p> <p>GRIMPE, G., 1925. Wiss. Meeresunt. Abt. Helgoland., N.F., 16, 1, 1: 1-124.</p> | <p>JAECKEL, G. A., 1958. Tierwelt d. Nord- und Ostsee, Lief. 37, Teil 9 b3: 479-723.</p> <p>NAEF, A., 1923. Fauna e Flora d. Golfo d. Napoli, 35. Monogr., Teil 1, 1: 1-863.</p> <p>RACOVITZA, E. G., 1894. Arch. Zool. Exp. Gén., 2: 23-49.</p> <p>TINBERGEN, L., 1939. Arch. Néerl. Zool., 3 (2-3): 323-64.</p> |
|---|---|



1. *Loligo vulgaris*; a, adult specimen; b, tentacle club. — 2. *L. forbesi*; a, adult; b, tentacle club. — 3. *Alloteuthis subulata*; a, adult male; b, adult female; c, development of fins. — 4. *A. media* compared with *A. subulata*; A, larvae; B, tentacle clubs; s, subulata; m, media.
(Fig. 3c and 4A after GRIMPE; Fig. 4B after ROBSON from JAECKEL; remainder original).

Family Loliginidae

Eyes completely covered by the skin which forms a cornea (myopsid condition). Left ventral arm hectocotylized.

Genus LOLIGO (Lamarck) Naef

Posterior end of body blunt, never prolonged into a "tail". Rhombic fins. Buccal arms with about 15 small suckers in two rows.

1. *Loligo vulgaris* Lamarck. Adult males carmine coloured. Medial suckers of the tentacles much bigger than the marginal suckers.
2. *L. forbesi* Steenstrup. Reddish brown. Medial suckers of the tentacles only slightly bigger than the marginal suckers.

Genus ALLOTEUTHIS Wülker

Posterior end of body often prolonged into a "tail". Heart-shaped fins. Buccal arms short and without suckers.

	Mantle length	Identification
3. <i>Alloteuthis subulata</i> (L.)	30-50 mm > 50 mm	Tentacle club at most 11 mm, mantle prolonged posteriorly. Distance from anterior edge of fin to "tail" tip > 50 % of total mantle length.
4. <i>A. media</i> (L.) Naef	30-50 mm > 50 mm	Tentacle club at least 12 mm, mantle pointed but not prolonged. Distance from anterior edge of fin to tip < 50 % of total mantle length.

Further Information on Identification

1. *Loligo vulgaris*: JAECKEL, 1958, p. 581, Fig. 53. NAEF, 1923, p. 197, Textfigs. 91-93, Pl. I, Figs. 1-6; Pl. II, Figs. 1-5.
2. *L. forbesi*: JAECKEL, 1958, p. 583, Figs. 54, 55a. NAEF, 1923, p. 202, Textfigs. 94, 95.
3. *Alloteuthis subulata*: GRIMPE, 1925, p. 44, Textfigs. 19-22, Pl. Figs. 10-14. JAECKEL, 1958, p. 584, Figs. 55b, 56, 57. NAEF, 1923, p. 219, Textfigs. 103-105.
4. *A. media*: GRIMPE, 1925, p. 66, Textfig. 25, Pl. Fig. 15. JAECKEL, 1958, p. 585, Figs. 56, 57. NAEF, 1923, p. 215, Textfigs. 101, 102.

References to Work on Biology

(Numbers after references give species referred to)

GRIMPE (1925) 1, 2, 3, 4. JAECKEL (1958) 1, 2, 3, 4. TINBERGEN and VERWEY (1945) 1.

Distribution

Species

Gulf of Bothnia.....	—
Gulf of Finland.....	—
Baltic proper.....	(1), (2), 3
Belt Sea.....	(1), 2, 3
Kattegat.....	1, 2, 3
Skagerak.....	1, 2, 3
Northern North Sea.....	1, 2, 3, (4)
Southern North Sea.....	1, 2, 3, 4
English Channel (eastern)...	1, 2, 3, 4
English Channel (western) ..	1, 2, 3, 4
Bristol Channel and Irish Sea	1, 2, 3, 4
South and West Ireland and	
Atlantic.....	1, 2, 3, 4
Faroe-Shetland Area.....	2, 3
Faroe-Iceland Area.....	—
Norwegian Sea.....	—
Barents Sea.....	—

References

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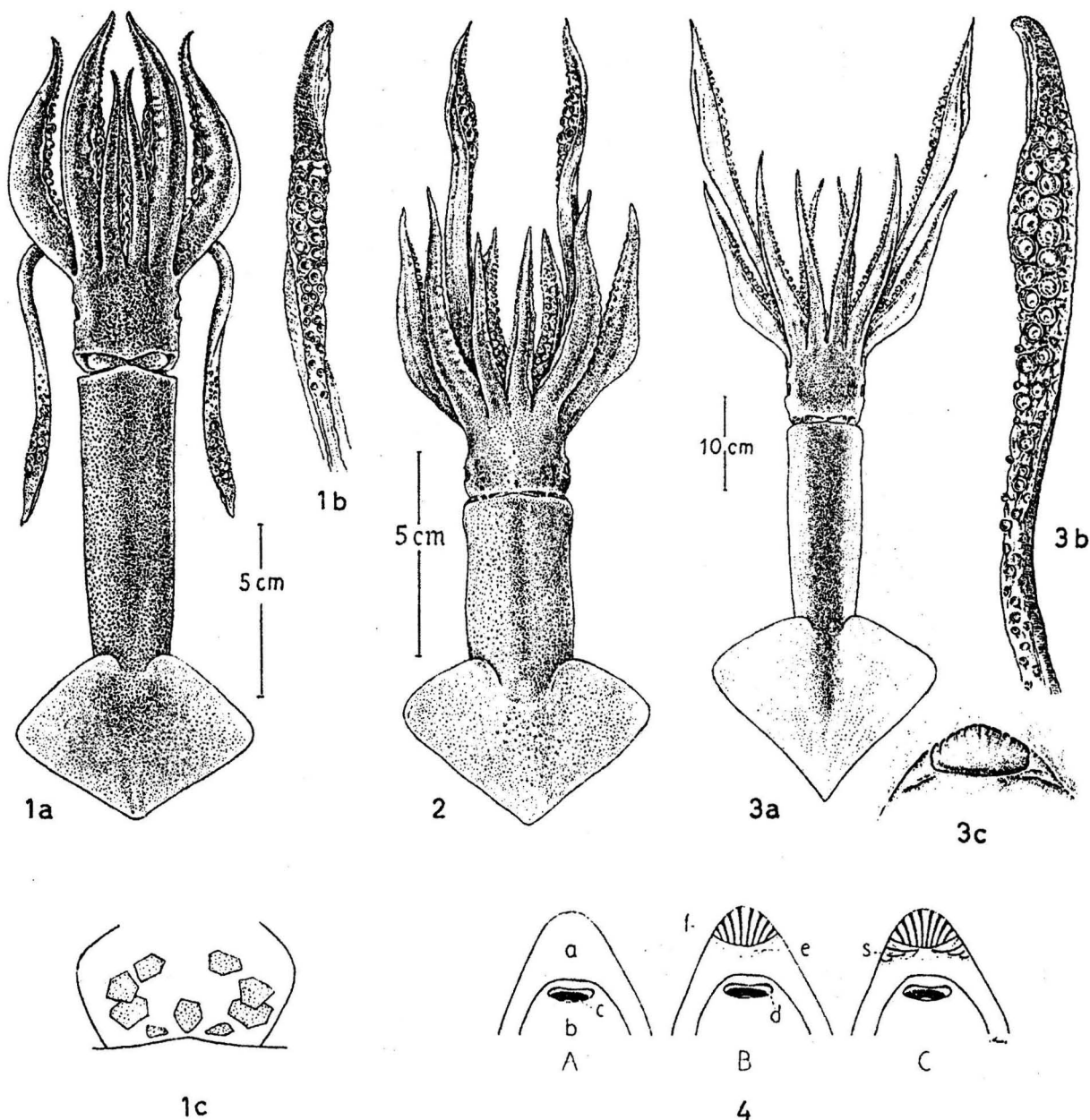


PLATE I

1. *Illex illecebrosus*; b, tentacle club; c, chromatophores on the back of the head at mantle length 15 mm. — 2. *Todaropsis eblanae*. — 3. *Todarodes sagittatus*; b, tentacle club; c, funnel pit. — 4. Ommastrephid funnel pits: A, Illicinae; B, Todarodinae; C, Ommastrephinae; a, funnel pit; b, funnel; c, opening of funnel; d, funnel valve; e, lunar fold; f, longitudinal folds; s, sidepockets. (Fig. 1a, b; 3a, b from PFEFFER; Fig. 1c from DEGNER; remainder original).

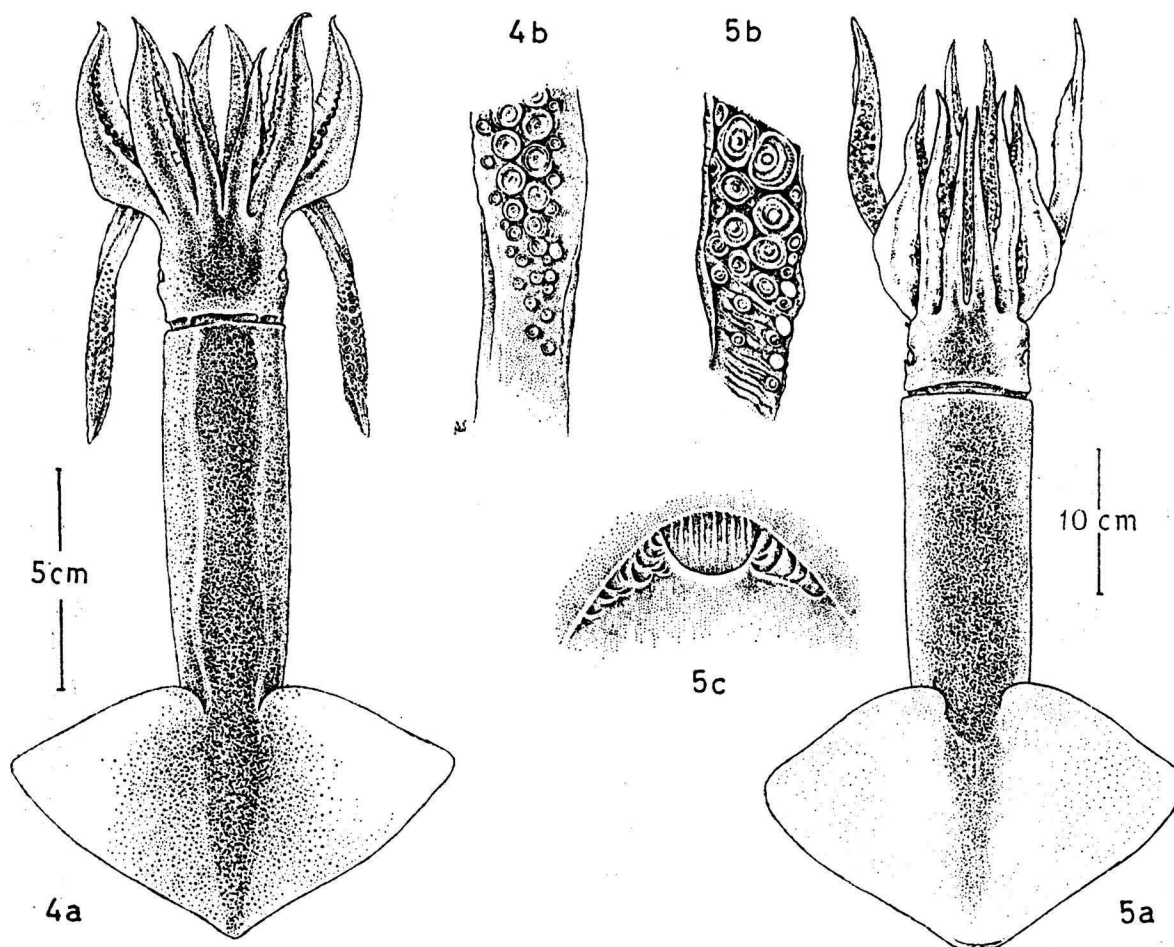


PLATE II

4. *Ommastrephes bartrami*; b, proximal part of tentacle club. — 5. *O. pteropus*; b, proximal part of tentacle club; c, funnel pit. (Figs. 4 a, b and 5c from PFEFFER; Fig. 5a, b from ADAM).

Family Ommastrephidae

Terminal rhombic fins. Funnel lowered into a deep pit. The funnel cartilages which articulate with the mantle have a characteristic $\perp$ -shaped groove. Arms with two rows of suckers. Tentacle club with four rows of suckers, the central suckers being enlarged.

Sub-family Illicinae (Plate I)

Funnel pit rather open without lunar fold and longitudinal folds (Fig. 4A).

Genus ILLEX Steenstrup

Distal part of the tentacle club with eight rows of very small suckers. The big suckers of the arms with smooth rings or blunt, rounded teeth.

1. *Illex illecebrosus* (Lesueur).

Genus TODAROPSIS Girard

Distal part of the tentacle club with four rows of suckers. The big suckers of the arms with many small teeth.

2. *Todaropsis eblanae* (Lesueur).

Sub-family Todarodinae (Plate I)

Front part of the funnel pit with lunar fold and longitudinal folds (Fig. 4B).

[Sheet 96]

Genus TODARODES Steenstrup

The big suckers of the tentacle club with about 18 teeth placed in some distance from each other. The stalk of the tentacles has two rows of suckers for most of its length.

3. *Todarodes sagittatus* (Lamarck).

Sub-family Ommastrephinae (Plate II)

Front part of funnel pit with lunar fold, longitudinal folds and side-pockets (Fig. 4c).

Genus OMMASTREPHEs d'Orbigny

The big suckers of the tentacle club with four bigger teeth placed crosswise among > 20 less prominent teeth.

4. *Ommastrephes bartrami* (Lesueur). Proximally to the nethermost fixing cushion of the club are found at least three suckers (Fig. 4b).
5. *O. pteropus* (Steenstrup). Proximally to the nethermost fixing cushion are found 0-2 suckers (Fig. 5b).

Family Chiroteuthidae (Plate III)

Strongly developed head and arm crown. Eyes voluminous. Fourth pair of arms longer and much stouter than the rest. The cartilages of the funnel ear-shaped with a central depression and one or two projections. Consistency of the animal more or less jelly-like.

Sub-family Chiroteuthinae

Tentacle club with four rows of modified suckers. With light organs on the ventral portion of the eyes, on the inner side of the ventral pair of arms, near the tip of the club and on the ink-sac.

Genus CHIROTEUTHIS d'Orbigny

With a larval "Doratopsis" stage (Fig. 6). The light organs on the eyes forming three diffuse streaks.

6. *Chiroteuthis veranyi* (Ferussac). The distal part of the arm suckers armed with teeth, the proximal edge smooth.

Sub-family Mastigoteuthinae

Tentacle club with many rows of suckers. Light organs, if present, scattered on the dorsal surface of fins, ventral portion of the mantle funnel head and ventral arms.

Genus MASTIGOTEUTHIS Verrill

With the characters of the sub-family.

7. *Mastigoteuthis* sp. The genus badly needs a revision and the reader is referred to the literature. *M. schmidti* Degner (Fig. 7) has been found in the area.

Family Cranchiidae (Plate III)

Mantle musculature feebly developed and the body is flabby. Dorsally and ventrally the connections between head and mantle have grown together. The funnel is big. The eyes are big and protruding in adult animals, stalky in juvenile specimens. Arms small with two rows of suckers. Tentacles with two or four rows of suckers on the stem, four rows on the club. The larvae with disproportionately long tentacles.

Genus DESMOTEUTHIS Verrill

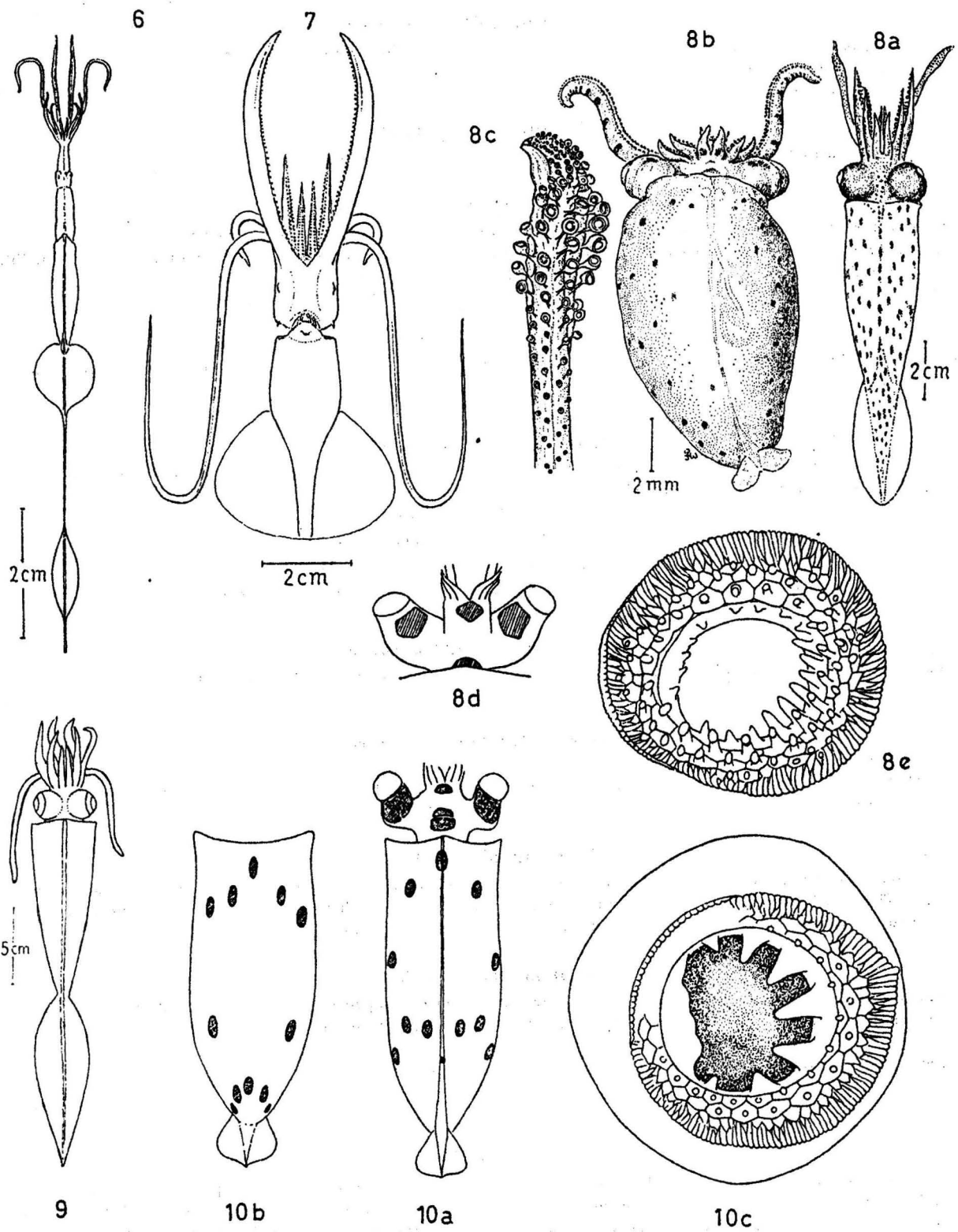
Mantle conical, in young animals barrel-shaped. Fins narrow and pointed, occupying up to 60% of the mantle length. Young specimens with small terminal semicircular fins. Light-organs on the ventral part of the eyes. The tentacles with four rows of suckers reaching from base to tip.

8. *Desmoteuthis megalops* (Prosch). Identification of larvae: see the following species.

PLATE III

6. *Chiroteuthis veranyi*, "Doratopsis" stage. — 7. *Mastigoteuthis schmidti*. — 8. *Desmoteuthis megalops*; a, adult specimen; b, larva; c, tentacle club; d, chromatophores on the back of the head at mantle length 10-15 mm; e, sucker from tentacle club, mantle length 21 mm. — 9. *Galietuthis armata*. — 10. *Taonidium pfefferi*; a dorsal, b ventral surface; c, sucker from the tentacle club, mantle length 21 mm.

(Fig. 6 after PFEFFER; Figs. 7, 8d, e, 9 and 10a, b, c from DEGNER; Fig. 8a from VERRILL; Fig. 8b, c from MUUS).



Genus GALITEUTHIS Joubin

Mantle conical. The hindmost part of the mantle with a long thin extension supporting the fins. Young specimens with small terminal semicircular fins. A round light-organ is found on the ventral part of the eyes. The tentacles with two rows of suckers on the stem. The club with four rows, of which the marginal ones disappear in adult animals while the rachial rows develop into hooks.

9. *Galiteuthis armata* Joubin. The larvae may be identical with the below mentioned *Taonidium pfefferi* Russell.

Genus TAONIDIUM Pfeffer

A provisional genus encompassing juvenile cranchiids of uncertain systematic position.

10. *Taonidium pfefferi* Russell. Is distinguished from young *D. megalops* by having two rows of suckers on the stem of the tentacles and by having the eye stems bent at right angles. A good mark of identification seems to be the bipartite chromatophore at the back of the head (Fig. 10a).

Further Information on Identification

1. *Illex illecebrosus*: ADAM, 1952, p. 80, Figs. 32-36. DEGNER, 1925, p. 40, Fig. 30. JAECKEL, 1958, p. 598. NAEF, 1923, p. 429, Textfigs. 216-222. PFEFFER, 1912, p. 393, Pl. 28, Figs. 1-6; Pl. 29, Figs. 1-8.
2. *Todaropsis eblanae*: ADAM, 1952, p. 94, Figs. 41, 42. DEGNER, 1925, p. 41, Fig. 31. JAECKEL, 1958, p. 598, Fig. 64. NAEF, 1923, p. 438, Textfigs. 223-227, Pl. V, Figs. 1-3. PFEFFER, 1912, p. 423, Pl. 30, Figs. 1-11.
3. *Todarodes sagittatus*: JAECKEL, 1958, p. 600, Figs. 65, 66. NAEF, 1923, p. 445, Textfigs. 228-237. PFEFFER, 1912, p. 439, Pl. 32, Figs. 1-3; Pl. 33, Figs. 1-12.
4. *Ommastrephes bartrami*: JAECKEL, 1958, p. 602, Figs. 67, 68. NAEF, 1923, p. 475, Textfigs. 238-246. PFEFFER, 1912, p. 465, Pl. 35, Figs. 1-8; Pl. 36, Figs. 1-7; Pl. 37, Fig. 16; Pl. 39, Figs. 1, 2.
5. *O. pteropus*: ADAM, 1952, p. 103, Figs. 46-48. JAECKEL, 1958, p. 606, Fig. 70. PFEFFER, 1912, p. 490, Pl. 37, Fig. 1; Pl. 38, Figs. 1-9; Pl. 39, Fig. 3, 4.
6. *Chiroteuthis veranyi*: ADAM, 1952, p. 111, Figs. 49, 50. NAEF, 1923, p. 381, Textfigs. 188-192. PFEFFER, 1912, p. 594, Pl. 44, Figs. 1-3; Pl. 45, Figs. 1-4.
7. *Mastigoteuthis schmidtii*: DEGNER, 1925, p. 50, Fig. 37. PFEFFER, 1912, p. 609 (the genus *Mastigoteuthis*).
8. *Desmoteuthis megalops*: MUUS, 1956, p. 3, Figs. 1-9.
9. *Galiteuthis armata*: NAEF, 1923, p. 398, Textfigs. 196-198. PFEFFER, 1912, p. 731.
10. *Taonidium pfefferi*: DEGNER, 1925, p. 71, Figs. 49-51. PFEFFER, 1912, p. 722.

Distribution

Species (Species in brackets occur only exceptionally)

Gulf of Bothnia.....	—
Gulf of Finland.....	—
Baltic proper.....	—
Belt Sea.....	(3)
Kattegat.....	(1), (2), 3
Skagerak.....	(1), 2, 3
Northern North Sea.....	(1), 2, 3, (5)
Southern North Sea.....	(1), (2), 3, 4
English Channel (eastern)...	(2), 3, 4
English Channel (western)...	(1), 2, 3, 4, (5)
Bristol Channel and Irish Sea	(1), 2, 3, 4
South and West Ireland and Atlantic.....	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Faroe-Shetland Area.....	1, 2, 3, 4, (5), 8, 9, (10)
Faroe-Iceland Area.....	1, 2, 3, 4, 6, 8, 9, (10)
Norwegian Sea.....	(1), (2), 3, 4, 8, ? 9
Barents Sea.....	3

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(Numbers after references give species referred to)
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Part two of this Key will appear in the June issue of the Newsletter [Sheets 97 & 98]

NOTE We are grateful to Dr. B. J. Muus for his permission to reproduce these keys. Since they were published over 20 years ago, it is realised that some revision to the nomenclature and references would be desirable.

MUSICAL MOLLUSCS

George Henry Lewes, that high-Victorian man of letters and dabbler in the natural sciences, wrote this about the sense of hearing in molluscs: 'Deafest than the deafest adder will they remain, charm we never so wisely. Equally insensible must they be to music. Beethoven's melodious thunder, Handel's choral might, Mozart's tender grace, Bellini's languorous sweetness, are evn more lost on them than on the lymphatic dowagers in the grand tier ... The Mollusc can only perceive noises' (1). Very interesting and probably very true, but did the devoted consort of George Eliot ever subject any molluscs to the music of the masters? Almost certainly not. But others seem to have done so.

About 1946 the British Snail-watching Society played tunes on various instruments to certain snails indoors, in the garden, and out in the country. The results of these experiments are not known to me but I don't suppose they proved or disproved the point raised by Lewes. When it comes to getting reactions, to music or anything else, molluscs are not very co-operative. Very likely they behaved as though playing a violin in the middle of a field is the most ordinary thing in the world and certainly not worth coming out of their shells for.

The trouble with experiments like these is not knowing what to expect. How can a mollusc react to music? What can it react with? These questions must have intrigued the English biologist, William Bateson towards the close of the nineteenth century. He tried to get a response from an open-valved saddle-oyster (Anomia), suspended in water in an aquarium, by rubbing his finger along the glass and making a creaking sound of a particular pitch. The sound had little of Mozart's tender grace but it did produce a positive response in the saddle-oyster - it shut its valves, quick (2).

On the other hand Mademoiselle Pierrette Giraut, a Parisian comic-opera star, was able to elicit a much more appreciative response from Isadore, her very own Roman Snail, the only pet snail in France in August 1964 when his birthday was celebrated (3). Apart from being affectionate, good natured, and long lived he knew he was called Isadore. When Pierrette called out, 'Where are you, my little Isadore?', he poked his head out of his shell at once. Of course Pierrette was the kind of girl who could make anyone come out of their shell. That was her job. But that doesn't invalidate Isadore's response, for if Mademoiselle Pierrette Giraut calling out, 'Where are you, my little Isadore?' isn't music then I don't know what is.

So much for molluscs as music lovers. What about them as musicians and singers? Fortunately evidence is not so thin on the ground here. A Mr. Sam Woodward, writing on 3rd. April 1829, says, 'As I was sitting in my room, on the first floor, about nine P.M. ... I was surprised with what I supposed to be the notes of a bird, under or upon the sill of the window. My impression was, that they somewhat resembled the notes of the wild duck in its nocturnal flight, and, at times, the twitter of a red-breast, in quick succession. To be satisfied on the subject, I carefully removed the shutter, and, to my surprise, found it was a garden snail, which, in drawing itself along the glass, had produced sounds similar to those elicited from the musical glasses' (4). In 1875 J. E. F. Harting published a similar observation on Helix aspersa (5). Possibly it was the same species which formed the subject of a short note published in 1837 by one S. Kennaway. This repeated the words of a communication he had received from a young lady. She had written: 'One evening I kneeled upon the window seat, when it was nearly dusk, and heard a soft musical sound; not a humming or murmuring, but a truly musical tone. I saw a Snail, and, having a desire to annihilate those destroyers of fruit and flowers, took it from the window. I had silenced the music! I recollect what I had heard, and felt a sort of pang' (6).

In case it is assumed that the window glass was largely responsible for the sounds produced in each of these three instances let me say that it ain't necessarily so. I have the authority of Monsieur Jean Cadart and his book Les Escargots to show that window glass is not a prerequisite for snail song. What Jean Cadart, teacher, snail breeder, and son of a snail breeder doesn't know about edible snails isn't worth knowing. So you've got to believe him when he says that the snails on his farm sing a high, reedy kind of song after light rainfall or when they are put into cages ready for market (7). It may or may not have been this kind of song which John Gottfried Ebel wrote about at the end of the eighteenth century. In a book about the people of Switzerland he talks about the edible snail industry. In the little garden grounds along the river Setter so many snails were kept during the summer season that the sound made by their denticulated jaws, while they were feeding, could be heard several paces away (8).

Molluscs may even be heard singing under water, according to Sir James E. Tennent, author of Sketches of the Natural History of Ceylon (1861). Describing his visit to a brackish-water lake at Baticaloa, Ceylon, Tennent refers to the sounds produced, so the fishermen there claimed, by the 'crying shell'. He says that the sounds 'came up from the water like the gentle thrills of a musical chord, or the faint vibrations of a wine-glass when its rim is rubbed by a moistened finger. It was not one sustained note, but a multitude of tiny sounds, each clear and distinct in itself; the sweetest treble mingling with the lowest bass. On applying the ear to the woodwork of the boat, the vibration was greatly increased in volume. The sounds varied considerably at different points as we moved across the lake, and occasionally we rowed out of hearing of them altogether' (9). Sadly, fishermen in India have insisted that fish produce such sounds in other, similar situations.

Generally speaking the musical properties of molluscs are, at best, poorly developed. A sea slug (Dendronotus frondosus) confined in a glass jar has been heard to make a sound like the clink of a steel wire (10). Helix aperta, a common snail in southern Europe, can emit sounds of a sort when irritated. At Corfu, for example, Lieut.-Col. Portlock noticed that when one was touched with a piece of straw it made a noise as though it was grumbling (11). And that astute observer of British snails, A. E. Boycott, noted that Lymnaea stagnalis often makes a sound something like 'pblorb' when opening its respiratory orifice at the surface of the water, the sound being audible some distance away (12).

The singing tree snails of Hawaii, on the other hand, are a very different story. They do really put on a good musical performance, it seems. The Rev. H.G. Barnacle heard them, for instance, when he was up in the mountains on the island of Oahu. 'I heard the grandest but wildest music', he said, 'as from hundreds of Aeolian harps, wafted to me on the breezes, and my companion (a native) told me it came from, as he called them, the singing shells. It was sublime. I could not believe it, but a tree close at hand proved it. On it were many of the Achatinella, the animals drawing after them their shells, which grated against the wood and so caused a sound; the multitude of sounds produced the fanciful music.' (13). We mustn't take too much notice of Paul Bartsch (14) and others who try to make out that the sounds are made by tree crickets. It's difficult enough to get hold of good evidence of molluscan music as it is without people misleading us with tree crickets and things.

REFERENCES

- (1) Seaside Studies, 1858, p. 356.
- (2) E. Step, Shell Life, 1901, p. 51.
- (3) Daily Mirror, Monday 3rd. August 1964.
- (4) Magazine of Natural History, vol. 2, p. 244 (1829).
- (5) In Search of Shells, Land and Freshwater, 1875, pp. 21-22.

- (6) The Naturalist, vol. 1, p. 38 (1837).
- (7) J. Cadart, Les Escargots, 1955.
- (8) Schilderung der Gebirgsvölker der Schweiz (A Description of the Tribes which inhabit the mountainous Parts of Switzerland), 1798.
The book is reviewed in the Appendix to vol. 27 of the Monthly Review Enlarged, 1798. Reference is made to the edible snail industry of the canton of Appenzell at p. 482 of this review.
- (9) Quoted in: A. H. Cooke, A. E. Shipley and F. R. C. Reed, Molluscs and Brachiopods, 1895, p. 50.
- (10) Ibid., p. 51.
- (11) Report of the British Association for 1848, p. 80.
- (12) Science Gossip (New Series) vol. 6, p. 285 (1900).
- (13) Journal of Conchology, vol. 4, p. 118 (1883).
- (14) P. Bartsch (in collaboration with J. T. Nichols), Fishes and Shells of the Pacific World, 1946, p. 163.

S. Peter Dance

GLEANINGS FROM THE FIELD

21.2.1885 Testacella at Bedford Park

I have lately found specimens of Testacella haliotide var. scutulum at Bedford Park, Chiswick living amongst ground ivy and nettles and at the roots of grass in the garden of an unoccupied house.

T. D. A. Cockerell The Field, Vol. 65, No. 1678, p. 234.

16.10.1886 Edible molluscs of the United States

Clam bake

A circular hearth is first made in the sand with large flat stones, upon which a fire is kept up until they are red hot, and the coals fall down into a flat heap. A layer of seaweed is then placed upon them, and upon the seaweed a layer of clams about three inches thick, covered by more seaweed; then follows a layer of green corn (maize) in the husk, intermixed with potatoes and other vegetables; then a layer of oysters, live crabs (confined in sacks to prevent their escape), and poultry dressed and seasoned; then more seaweed. The pile is then covered with canvas, overlaid with wet seaweed, to prevent the steam escaping, and left to cook. In an hour or so it is done, and everyone falls to and helps himself.

Ernest Ingersoll The Field, Vol. 68, No. 1764, p. 555.

24.10.1896 Pheasants and snails

On the 17th. inst. whilst shooting on some sand burrows close to the sea, I killed a cock pheasant whose crop contained two lizards and forty-two whole snails, of which I send specimens. It was a young bird, in forward plumage, and perfectly healthy.

G. B. Bowen (Newport, Pembrokeshire) The Field, Vol. 88, No. 2287, p. 655.

[The specimens were full-grown banded snails, Helix nemoralis. They had been swallowed entire without injury - Ed.]

23.5.1896 Slug caught in mouse trap

The following incident occurred this morning here in my store room, which you may perhaps care to put in your paper. A penny-a-hole mousetrap had been set in that room baited with Cheddar cheese. These mousetraps, as you know, are set with cotton, which the mouse must bite through before getting at the cheese; the string

when cut, releases the spring, which catches the mouse round the neck and strangles it very quickly. Several mice had been caught lately in this trap, but this morning a large slug, about 3in. long, was found caught in the above-mentioned manner. I enclose the bits of cotton for your inspection; they are just as they were when taken out of the trap; and from the ends it would appear to me that the slug had bitten through the cotton, a thing I do not know it was possible for a slug to do.

Lieut. Col. W. P. Monckton ([REDACTED] , Ballatrow, Bristol) The Field, Vol. 87, No. 2265, p. 813.

9.2.1889 Large oyster

I beg to send you the dimensions of a very perfect oyster which a resident here is having set up as a specimen. It was dredged off Christchurch Head this week, the measurements I took myself: Length 7in; breadth 7in; circumference, 16in. and 20½in. round the outside edge, weight 3½lb.

J.A. (Swanage) The Field, Vol. 73, No. 1885, p. 190.

23.2.1889 Large oyster

In reply to Mr. Streeter's query, no sign was found of any pearl formation in the oyster, and the interior of both shells presents a clear white, and even enamelled surface. The old fishermen, however, say that thirty years ago they used to find small pearls in the oysters caught off "Old Harry Rocks" between here and Bournemouth.

Jas. Andrews (Swanage) The Field, Vol. 73, No. 1887, p. 260.

(from June Chatfield)

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 976th. (Ordinary) Meeting held on 19th. May 1984 at B.M. (N.H.)

In the Chair: Mr. T. Pain with 36 members and friends present.

Nominations and Elections: 1 full member, 1 junior member

Full member: Harders, Mrs. A.E., [REDACTED], Oxton, near Birkenhead, Merseyside.

Junior member: Brocklehurst, Master S., [REDACTED], Draycott, Derbyshire, [REDACTED]

Lecture: 'Omani Mollusca and their habitat' by Mrs. K. M. Smythe

Announcement: The secretary announced that the provisional programme for the 9th. Malacological Congress to be held in Edinburgh in 1986 was available for members to see.

Papers read: 'Trachycystis lamellifera (Smith) in Tanzania (Pulmonata: Endodontidae sensu lato) by B. Verdcourt

Announcements and Correspondence: Mrs. Fogan requested that all members interested in purchasing the book 'Seashells of the Sultanate Qaboos Nature Reserve at Qum' by K. Smythe (£2, but only available from Oman) should sign a list.

Any other business: Two tickets for the Chelsea Flower Show were auctioned for the benefit of the Society's funds.

The meeting closed at 4.43 p.m.

Members Exhibits

D. T. Holyoak & Helicella (Xeropicta) derbentina from France
M. B. Seddon

T. Pain	The Muricidae of Oman
K. Smythe	Some Omani marine mollusca
A. Arthur	<u>Cymatiidae</u> - occurring off Oman + a couple of common Indian Ocean species not yet reported from Oman
M. Mitchell	A small collection of shells from Senegal, W. Africa
C. J. Chibnall	Shells of the family Neritidae
E. Sándor	1. Seashells of Oman 2. Some controversial seashells from the Philippines
B. Glayzer	Kuwait shells which occur in Oman
J. D. Nunn	Information for members

The 977th. (Ordinary) Meeting held on 20th. October 1984 at B.M. (N.H.)

In the Chair: Mr. A. Norris with 40 members and friends present.

Death of members: the death of three members of the Society was announced: Mr. S. Stillman Berry (a life member); Mr. E. Ing; Dr. Luis Gasull.

Nominations and Elections: 4 full members

1. Francis, S.H., [REDACTED], Belfast, [REDACTED]
2. Glauser, M., [REDACTED], 1224 Chene Bougeries, Switzerland
3. O'Donovan, Miss G., c/o. Botany School, Trinity College, Dublin, D2, Eire
4. Pierpoint, C., [REDACTED], Wallasey, Merseyside, [REDACTED]

Announcement: Dr. T. Gascoigne requested the help of members for his current project studying the egg masses of Ascoglossans.

Lecture: 'Working for the N.C.C.' by Dr. Shelagh Smith

- Papers read:
1. 'An undescribed Acicula (Gastropoda, aciculidae) from Portugal and a record of A. algerensis in Morocco' by D. T. Holyoak and M. B. Seddon.
 2. 'Intraspecific variation in Nesovitrea hammonus (Strom) (Pulmonata: Zonitidae) in Sweden, with special reference to colour dimorphism' by E. von Proschwitz.
 3. 'The taxonomic status of Littorina tenebrosa Montagu as assessed by morphological and genetic analyses' by K. Janso and R.D. Ward
 4. 'A new species of Trochita (Gastropoda: Calyptraeidae) from Oman: a relict distribution and association with upwelling areas' by J. D. Taylor and K. R. Smythe.
 5. 'Three new buccinids from Oman and notes on Anachis fauroti (Jousseume) (Prosobranchia: Buccinacea)' by K. R. Smythe.

Announcements and correspondence: the secretary read a letter from America offering a specimen of Cypraea leucodon for sale.

Any other business: a book was auctioned for the benefit of the Society's funds.

The meeting closed at 5.12 p.m.

Members exhibits

J. D. Nunn	Information for members
E. Sándor	Superfamily Helicacea
	Family Bradybaenidae : <u>Subfamily Helicostylinae</u>
J. Light	Three Panamanian shells; One Australian Pecten
S. M. Smith	Reports to the Nature Conservancy Council
T. Pain	Orthalicidae (Bulimulacea): Tree snails from the Neotropical region
B. Coles	Jamaican tree snails
A. Rundle	Tin of pearls!

D. Long	Pictures of Paleocene Turrids; Silurian 'Snail'
J. Llewellyn-Jones	Photocopied pages from the International Red Data Book on Tree Snails and the threat of extinction of many species
D. Guntrip	Molluscan livestock from Ireland
W. Karo	<u>Cypraea donmoorei</u> Petuch Colombia
	<u>Cypraea aurantium</u> Gmelin Philippines
	<u>Cypraea surinamensis</u> Perry Brazil
	<u>Cypraea porteri</u> Cate Philippines
	<u>Cypraea rosselli</u> Cotton West Australia

The 978th. (Ordinary) Meeting held on 17th. November 1984 at B.M. (N.H.)

In the Chair: Mr. S. P. Dance with 44 members and friends present.

Nominations and Elections: 4 full members and 1 family membership

1. Barton, Mrs. L.A., [REDACTED], Southbourne, Emsworth, Hants.
2. Bennett, Ms. M.S., [REDACTED], Phoenix, Arizona 85012, U.S.A.
3. Tuck, J.U., B.Sc., G.I.Biol., [REDACTED], Redruth, Cornwall, [REDACTED]
4. Yazbeck, Miss J., c/o. Mr. A. Rami, [REDACTED], Nottingham, [REDACTED]

Family members

Priestman, Dr. G.M., Roseland, [REDACTED], Arundel, West Sussex, [REDACTED]
 Priestman, Mrs.

Announcements and Correspondence: The secretary asked that anyone interested in an exchange of the Journal of Conchology for the Spanish Journal 'Iberus' should contact her. It was announced that there would be a leaf-litter workshop and for those interested to contact Dr. June Chatfield.

The chairman welcomed all members of the Malacological Society to the joint meeting of the two societies.

Session 1.

1. 'Identification of fossil bivalve fragments' by Dr. A. Rundle
2. 'The family Pectinidae Rafinesque 1815' by Dr. E. Sándor
3. 'Man, the scallop and its relatives' by Mr. J. Llewellyn-Jones

Session 2.

1. 'Arcoid bivalves' by Dr. G. Oliver
2. 'Bivalve shell Structure' by Dr. J. Taylor
3. 'Freshwater pea-shells - Pisidium' by Dr. J. Chatfield

The meeting closed at 5.35 p.m.

Members exhibits

E. Sándor	Family Pectinidae Rafinesque, 1815
K. R. Smythe	<u>Chlamys townsendi</u> (Sowerby 1902) leg K. Smythe, Haql, Masirah, Dec. 1980
J. Light	Worldwide Pectinidae
J. Llewellyn-Jones	Pectinidae worldwide
John Llewellyn-Jones	Man and the scallop
A. Rundle	Illustration of talk on identification of fossil bivalve fragments
J. D. Nunn	Information for members
J. D. Nunn and	British Marine Bivalves
J. Light	Review copy of 'Biology of Opisthobranch Molluscs Vol. II' by Thompson & Brown

S. P. Dance	A sinistral (living) ' <u>Helicella</u> ' sp. collected at Rosas, Costa Brava 1984 with a dextral one for comparison
P. E. Negus	Fossil bivalves - Jurassic to Red Crag
J. Chatfield	Some books relating to Pisidium and specimens

GENERAL NOTES

We are grateful to an anonymous donor for the gift of £100 to the Society's funds. Thank you.

SOCIETY MEMBERSHIP/PUBLICITY

In order to maintain a good membership of the Society, and particularly to encourage young people to join, it would be very helpful if members who happen to work in schools, colleges, libraries, etc. would put up a Conch. Soc. poster in a prominent place and append their name for passing on any enquiries. Leaflets about the Society and application forms could be held also. Supplies of the posters, leaflets and forms can be obtained from the Hon. Secretary, Dr. Julia Nunn, Flat 24, Park Hill Court, Addiscombe Road, Croydon, Surrey, CRO 5PG, to whom any enquiries should be sent. Also, any members living at or near the coast might like to arrange for a poster to be placed in their local library or museum. Any help that you can give in this matter will be appreciated as it is in all our interests to maintain a growing and lively membership.

CORRECTION

In the September issue of the Newsletter, No. 90, page 201, the author, N. K. Atkinson, points out that he should have deleted the last sentence of the note on Pisidium casertanum. 'This man-made pool . . . ' (The Isle of May).

REQUEST FOR INFORMATION

I am considering conducting a research project on the ecological genetics of sinistrality in Lymnaea peregra, and would be grateful for information on the current distribution of this form. At present, the only information of which I am aware is that contained in the classic papers of Boycott, Diver and colleagues in the 1920s and 1930s. These papers make reference to only a small number of populations each containing a very low frequency of the sinistral variant. If this variant turns out only to exist in, say, four populations, with a frequency of 2% in each, a project on its ecological genetics would probably not be viable. However, if 10 or 20 populations containing sinistrals can be located, with frequencies of 5 or 10% in some of them, then I would be able to proceed. The information I am seeking is the location of any populations where sinistrals are found with a frequency of 1% or more, and an estimate (or guess) of what the frequency actually is. Finally, if anyone is already conducting a project of the sort I envisage and feels that I would be invading his or her 'territory', I would appreciate that information also.

Dr. Wallace Arthur, Department of Biology, Sunderland Polytechnic, Sunderland,
SR1 3SD

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

c/o. British Museum (Natural History), Cromwell Road, London, SW7 5BD
ITZN 59 3 December 1984

The following Opinion has been published by the International Commission on

Zoological Nomenclature in the Bulletin of Zoological Nomenclature, volume 41, part 4, on 30 November 1984:

Opinion No.

1281 (p. 223) Acmaea limatula Carpenter, 1864 (Mollusca, Gastropoda): conserved.

The Commission regrets that it cannot supply separates of Opinions.

R. V. Melville, Secretary

A. E. CRAVEN - A FEW MORE FACTS

Looking through the accession books of the British Museum (Natural History) I came across a few more entries dealing with Albert Craven. Apart from the types either given to or purchased by the Museum in 1891 there are entries covering nearly 20 years. The latest is in February 1901 when he donated Vitrina pellucida from Addington, Surrey and "Pisidium pusillum" from Waddon, Surrey. The entries only serve to underline the extensive journeys he made as a seaman, e.g. India (Madras, Bombay and Vizagapatam), S. Africa (Port Elizabeth, Durban, Algoa Bay, Cape Town), St. Helena (Diana's Peak), Ascension, Tenerife, Comoro Is., Colombo, Gibraltar, Cannes, Hobsons Bay Victoria, Aden, Folkestone and Weymouth. Some slugs he collected at Durban were described by T. D. A. Cockerell as Urocyclus pallescens in Ann. Mag. Nat. Hist. 7: 101 (1891) (now Elizolimax flavescens (Keferstein)). Under stones at Port Elizabeth he collected some vaginulids described by Cockerell (Conchologist 2: 216 [1893]) as Vaginula saxicola (now Laevicaulis saxicolus (Cockerell)). He was certainly interested in all molluscs from minute land snails and slugs to sea shells, Cephalopods and sea slugs and his knowledge of the whole phylum was obviously very extensive indeed.

(ref. Conch. Newsletter 69, p. 147-153, June 1979)

B. Verdcourt

PUBLICATIONS RECEIVED

Note. All items mentioned will be held by T. E. Crowley for three months after issue of this Newsletter, so that any members who wish may borrow them during this period.

Porcupine Newsletter, Vol. 3, No. 2 (November 1984)

Contents include 'A Review of the Reproductive Biology and Demography of Halichoerus grypus, the Grey Seal' by Sheenagh Crane; a description of the Department of Oceanography at Southampton University; a book review 'Sublittoral Ecology', Ed. R. Earll and D. G. Erwin; a survey of fish recorded from Druridge Bay, Northumberland; and an article with map on the possible past existence of the legendary Atlantic Island of Hy Brasil by W. Fraser (reprinted from the Proc. R. Dublin Soc. 1879).

T. E. Crowley

SNIPPETS FROM THE LATE A. E. ELLIS

A garden is a loathsome thing--Eh! what?

Blight, snail,

Pea-weevil,

Greenfly, such a lot

My handiest tool
Is powerless, yet the fool
(Next door) contends that slugs are not.
Not slugs! in gardens! when the eve is cool?
Nay, but I have some brine,
'Tis very sure they shall not walk in mine.

From a pamphlet entitled Nature in a Shanghai Garden by Arthur de Carle Sowerby; reprinted in Sowerby of China. Arthur de Carle Sowerby, F.R.G.S., F.Z.S. by R. R. Sowerby, p.49 (Kendal 1956). From Mrs. N. F. McMillan.

Like snails I see the people go
Along the pavement, row on row;
And each one on his shoulder bears
His coiling shell of petty cares--
The spiral of his own affairs.

Eleanor Hammond, From a Street Corner.

"The snail," says the Hindoo, "sees nothing but his own shell, and thinks it the grandest place in the universe." Sydney Smith, Peter Plymley Letters No. 10.

Of all the lunacies earth can boast,
The one that must please the devils the most
Is pride reduced to the whimsical terms
Of causing the slugs to despise the worms.

Robert Barnabas Brough, The Tent-maker's Story.

A wife, domestic, good, and pure,
Like snail, should keep within her door;
But not, like snail, with silver track,
Place all her wealth upon her back.

W. W. How, Good Wives.

How ingenious an animal is the snail. When it encounters a bad neighbour it takes up its house and moves away. Philemon, of Soli, Cilicia, c.300 B.C.

DIETER SCHIERENBERG BV, Prinsengracht 485-487, 1016 HP Amsterdam, The Netherlands, specialises in Malacological journals and rare books. Please ask for specialised catalogues and offer us your set of Journal of Conchology.

ANNUAL SUBSCRIPTIONS, 1985. All Members are reminded that the annual subscription was due on 1st. January, and any who have not paid are earnestly requested to send remittances without further reminder. All cheques and postal orders should be made payable to the Society and sent to me.

Please note that no further publications can be sent to any Members whose current subscriptions remain unpaid (although any which have been withheld will be sent on receipt of the arrears) and Members whose subscriptions are in arrears are ineligible to vote in the election of Council Members.

Subscription rates are as follows:

Ordinary Member	£10.00	Institutional Member	£15.00
Family Members	£12.00	Junior Member	£ 2.00

Ordinary, Family and Institutional Members may deduct £1 if paid before 31.3.85.

OVERSEAS MEMBERS ARE ASKED TO PAY IN STERLING AS THE BANK CHARGE FOR CONVERSION IS NOW A MINIMUM £3.00.

Marjorie Fogan (Hon. Treasurer),
[REDACTED], Atherton, Manchester, [REDACTED]

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A GUIDE TO THE SHELL CHARACTERS OF BRITISH CHITONS

This guide is not intended to replace the excellent Paper for Students no. 9 by Gillian Mathews, but to augment it by introducing shell characters which the field worker may easily recognise with a little study. As G. Mathews admits, these are tricky animals to name correctly so that additional characters for identification, especially shell characters, should be welcome to the field recorder.

Chitons have shells composed of 8 articulating plates called valves: 1 head valve, 6 intermediates, and 1 tail valve - Fig. 1a. These overlap, from front to rear, like roof-slates. In some the intermediate valves are rounded but most are angled at the median line forming a keel. Each valve articulates with the one in front by means of two flat projections, called sutural laminae, extending forward from the front edge, on either side of the keel - Fig. 1b. These are inserted beneath the rear edge of the valve in front. In some the articulating projections are extended downwards, encircling the lateral edge, for insertion into the girdle. It is there called an insertion plate and it is nearly always slit - Fig. 1c.

The 11 species of British Chitonida (12 by some authorities) are distributed among three suborders as follows:-

LEPIDOPLEURINA - no insertion plates except on the head plate of Hanleya hanleyi.

Lepidopleurus asellus (Gmelin 1791)
Lepidopleurus cancellatus (Sowerby 1839)
Lepidopleurus scabridus (Jeffreys 1880)
Hanleya hanleyi (Bean 1844)

ISCHNOCHITONINA - slit insertion plates on all valves, girdle smooth or granulated.

Ischnochiton albus (Linné 1767)
Lepidochitona cinerea (Linné 1767)
Tonicella marmorea (Fabricius 1780)
Tonicella rubra (Linné 1767)
Callochiton achatinus (Brown 1827)

ACANTHOCHITONINA - slit insertion plates on all valves, tufts of calcareous bristles on girdle at base of sutures and around the head and occasionally on the tail plate.

Acanthochitona communis (Risso 1826)
Acanthochitona crinita (Pennant 1777)
var. gracilis (Jeffreys 1859)

A. crinita var. gracilis differs from the typical form only in having an extra tuft, occasionally two tufts, of calcareous bristles behind the tail plate. It is

thought by some to constitute a distinct species, and has been listed under the name A. discrepans (Brown 1827) which is a synonym of A. communis (Risso 1826).

One of the practical difficulties in determining British chitons has always been to decide whether insertion plates are present or not, i.e. whether the specimen is an ischnochitonid or a lepidopleurid; acanthochitonids are always obvious because of the tufts of bristles. Dissecting the edge of an intermediate plate from the girdle tissues requires a certain technical skill and damages the specimen. An alternative method, based on the pattern of granules on the intermediate valves, is here offered. For this a x10 hand lens, or a low-power microscope, is essential.

The two halves of an intermediate valve, on either side of the keel, are mirror images of one another. In most species a line runs from the beak on the posterior mid-line, diagonally across the valve to the anterior lateral edge and thus marking off two roughly triangular areas. The posterior triangle is called the 'lateral area' and the anterior the 'pleural tract', see Fig. 1b. The style of granular ornament is different on these two triangles in the Lepidopleurina, but not in the other two suborders - compare Figs. 1b and 1c.

Granules radiating from the beak are usually arranged in curving divaricate lines. These lines intersect producing a pattern like that seen in a sunflower head or in some cobbled streets - Fig. 1c. On the lateral area the pattern is always divaricate in British species, but in the Lepidopleurina the granules, as they cross over onto the pleural tract, change to a pattern of slightly diverging, more or less straight, lines - Fig. 1b. Hence, if the pattern on the lateral area is divaricate and changes to linear on the pleural tract the specimen is a lepidopleurid; but if the pattern is divaricate all over then it belongs in one of the other two orders, which are separable by presence or absence of sutural tufts of bristles.

The use of this criterion, which is obvious once recognised, does require careful initial examination, and the advantage is that the specimen need not be damaged. Hoping that this rule had a more general application, I examined a number of foreign chitons and found that some foreign acanthochitonids have linear ornament on the pleural tract. The rule therefore, though reliable for the known British chitons, cannot be applied outside of the British Isles.

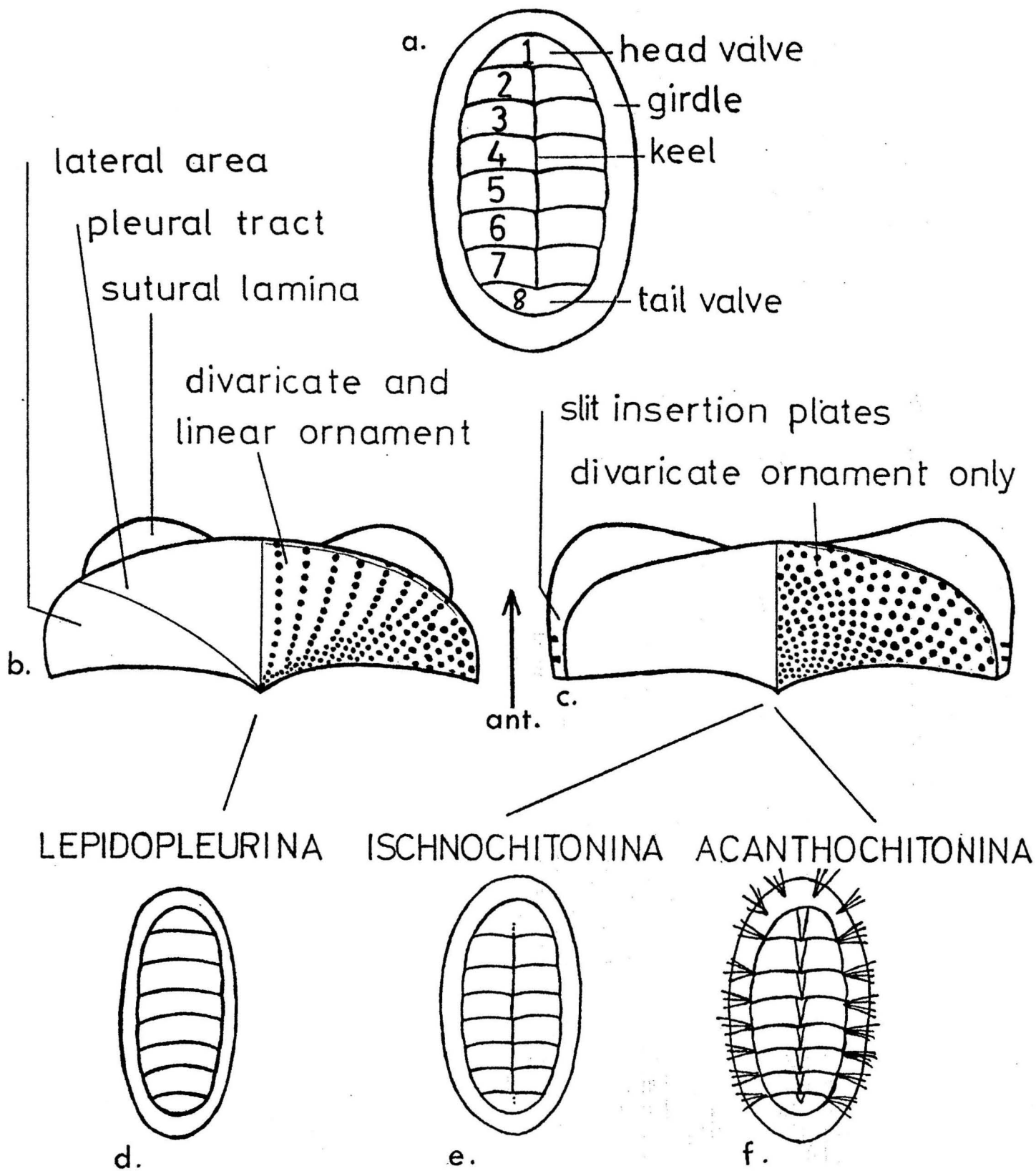
Three species, Lepidopleurus asellus, Lepidochitona cinerea, and Ischnochiton albus may easily be confused owing to the variation in colour of L. cinerea and, to a lesser extent, of L. asellus. I. albus seems always to be white. L. asellus is keeled, about the same size and shape, and often the same colour as L. cinerea, but the presence of linear ornament on the pleural tract confirms L. asellus.

A uniformly whitish specimen with divaricate ornament may be either a white L. cinereus or I. albus. If the granules on the girdle are noticeably stronger than those on the valves then it is probably I. albus. Turn it over and hold it up to the light. If no slit is visible, through the girdle tissues, in the edge of any intermediate valve then it is certainly I. albus.

Strongly divaricate arrangement of granules on the intermediate valves, which are about equal in strength with those of the girdle, indicate L. cinerea. Turn it over and through the girdle tissues will be seen a slit in the middle of any intermediate valve. This confirms L. cinerea - whatever the colour.

For those who are already familiar with British Chitons the following rules will serve as a memory aid and save running through the key each time.

- 1) A chiton with tufts of calcareous bristles is probably Acanthochitona crinita anywhere in the British Isles except the Channel Islands where A. communis



SYSTEMATIC KEY TO THE BRITISH CHITONS

<u>Lepidopleurus asellus</u>	- ovoid outline, keeled		)No slit insertion plates
<u>cancellatus</u>	- linear ornament in long chain-like rows	)Valves not	)except in head plate of
<u>scabridus</u>	-)coarse tubercular)keeled but	)Hanleya hanleyi.	Divaricate
<u>Hanleya hanleyi</u>	- scattered bristles on girdle)ornament	)rounded	)ornament on pleural tract.
<u>Callochiton achatinus</u>	- girdle with diamond pattern	)Divaricate ornament	)
<u>Tonicella marmorea</u>	- girdle smooth, leathery	)faint or absent	)No tufts
<u>rubra</u>	- girdle leathery finely granulated	)	)of
<u>Lepidochitona cinerea</u>	- girdle and valves equally granulated, divaricate pattern strong	)calcareous	)Slit insertion
<u>Ischnochiton albus</u>	- girdle more coarsely granulated than valves, divaricate pattern	)bristles	)plates present.
	on valves weak	)	)Divaricate
			)ornament only
			)on valves.
<u>Acanthochitona communis</u>	- round granules on valves	) 18 tufts of	)Tufts of
<u>crinita</u>	-) ovoid granules	) bristles	)calcareous
var. <u>gracilis</u>	-) on valves	More than 18 tufts of bristles	)bristles

occurs. A. crinita var. gracilis has two extra tufts of bristles on the tail valve.

- 2) A chiton with strong divaricate ornament, and an equally strong granulation of the girdle, is probably Lepidochitona cinerea anywhere in the British Isles except in Scotland where Ischnochiton albus occurs.
- 3) A predominantly reddish mottled chiton with smooth valves is probably Tonicella marmorea: the smooth leathery girdle confirms this but check for the often smaller T. rubra with finely granulated girdle.
- 4) An oval and keeled chiton with linear ornament on the pleural tract can only be Lepidopleurus asellus since L. scabridus and L. cancellatus are elongated and have rounded valves.
- 5) A chiton with scattered calcareous bristles on the girdle, not gathered into tufts, can only be Hanleya hanleyi.
- 6) A chiton with cancellated girdle producing a diamond pattern on the girdle can only be Callochiton achatina.

To the end of 1976 chitons have been reported from the following British Marine Census Areas.

- A. communis from CA's 13-18, 21, 23, 36.
A. crinita from CA's 1-3, 5-7, 9, 11, 12, 14-24, 26, 28-32, 34-36.
var. gracilis from CA's 11, 14, 16, 17, 21.
C. achatinus from CA's 1-3, 7, 9, 11, 12, 15-19, 23, 26-32, 35.
H. hanleyi from CA's 1, 2, 5, 9, 11, 18, 19, 23, 26, 29, 30, 35.
I. albus from CA's 1, 3, 5, 18, 23, 26-30.
L. cinerea from CA's 1-3, 5-7, 9, 11-32, 34-36.
L. asellus from CA's 1-3, 5-7, 9, 11-14, 16-18, 19-21, 23, 25, 26, 29, 30, 35-37.
L. cancellatus from CA's 1, 3, 11, 15-19, 22, 26, 28-30, 32, 35, 36.
L. scabridus from CA's 16, 18.
T. marmorea from CA's 1, 2, 3, 7, 26-32.
T. rubra from CA's 1-3, 5-7, 9, 11, 16, 18, 21, 23, 25, 26-32, 35.

A KEY TO THE SHELL CHARACTERS OF BRITISH CHITONS

- | | |
|---|---|
| 1. a. Girdle with tufts of bristles at the bases of the sutures | 2 |
| b. Girdle without tufts of bristles | 4 |
| 2. a. Girdle with only 18 tufts of bristles | 3 |
| b. Girdle with more than 18 tufts of bristles, extra ones behind the tail valves - <u>Acanthochitona crinita</u> var <u>gracilis</u> | |
| 3. a. Valve ornament of relatively large, ovoid granules - about 4 to the millimetre - <u>Acanthochitona crinita</u> | |
| b. Valve ornament of smaller rounded granules - about 6 to the mm - <u>Acanthochitona communis</u> | |
| 4. a. Intermediate valves with divaricate and linear ornament | 5 |
| b. Divaricate ornament only on intermediate valves | 8 |
| 5. a. Valves rounded. Whole animal elongated | 6 |
| b. Valves keeled. Animal oval. | 7 |
| 6. a. Linear ornament arranged in long chain-like rows. Lateral area very narrow - <u>Lepidopleurus cancellatus</u> | |
| b. Linear ornament coarsely tubercular - <u>Lepidopleurus scabridus</u> | |
| c. Girdle with scattered bristles not gathered into tufts. Head valve only with slit insertion plates. Linear ornament coarsely tubercular - <u>Hanleya hanleyi</u> | |
| 7. a. No spines on girdle - <u>Lepidopleurus asellus</u> | |
| 8. a. Girdle cancellated in diamond pattern like snakeskin. Valves mottled brown, red and yellow. Divaricate ornament very fine. Two slits in intermediate insertion plates visible through girdle tissues - <u>Callochiton achatinus</u> | |

9. a. Girdle smooth and leathery. Valves mottled red and white.
Divaricate ornament absent or only faint
- Tonicella marmorea
- b. Girdle not smooth 10
10. a. Girdle finely granulated with white streaks at sutures. Very
like T. marmorea but half the size. Valves almost smooth
- Tonicella rubra
- b. Girdle coarsely granulated 11
11. a. Girdle more coarsely granulated than valve ornament, composed
of oval granules arranged vertically. Valves and girdle always
uniformly yellowish white. No slits in insertion plates of
intermediate valves visible through girdle tissues
- Ischnochiton albus
- b. Granulations on valve and girdle equally prominent. Colour
variable, greenish grey, white or with symmetrical white
pattern, sometimes yellowish. 1 slit in insertion plates
visible through girdle tissues
- Lepidochitona cinerea

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C. P. Palmer, [REDACTED], Sutton, Surrey, [REDACTED]

CEPHALOPODA KEYS

(By B. J. Muus) 1963

Part one of this key appeared in the March issue of the Newsletter, and the remainder follows.

NOTE We are grateful to Dr. B. J. Muus for his permission to reproduce these keys. Since they were published over 20 years ago, it is realised that some revision to the nomenclature and references would be desirable.

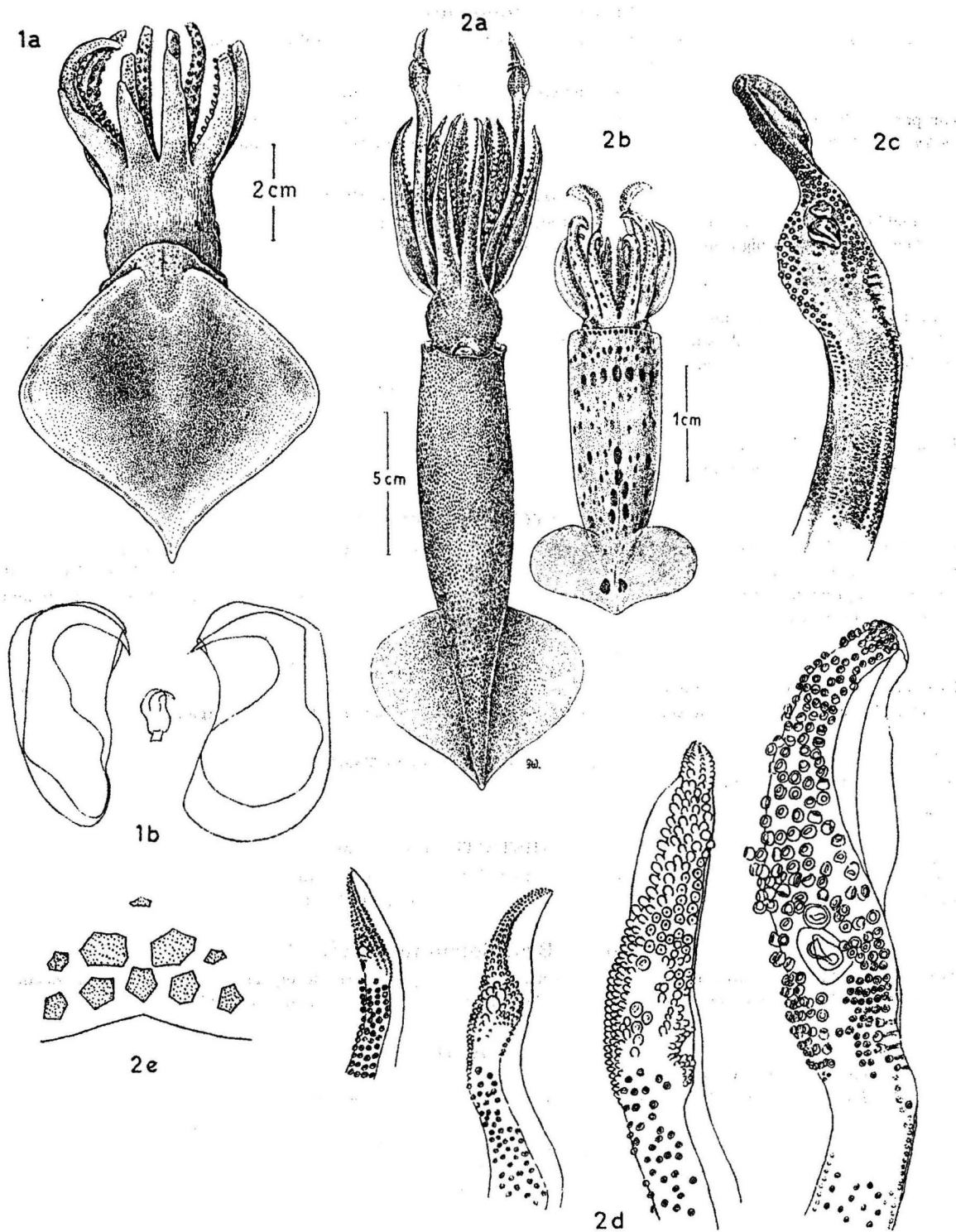


PLATE I

1. *Octopoteuthis sicula*; a, adult animal; b, hooks at mantle length 22 mm. — 2. *Gonatus fabricii*; a, adult animal; b, larva; c, tentacle club from adult animal; d, tentacle clubs at mantle lengths: 10, 13, 18 and 21.5 mm; e, chromatophores at the back of the head at mantle length 6-18 mm. (Figs. 1b, 2d, e from DEGNER; remainder original).

Family Octopoteuthidae (Plate I)

Head very big, mantle conical. The fins form an almost square continuous dorsal plate. Tentacles always missing in adult animals.

Genus OCTOPOTEUTHIS Rüppell

Skin partly jelly-like. Arms with two rows of suckers modified into hooks covered by membraneous hoods.

1. *Octopoteuthis sicula* Rüppell. Tentacles missing in animals with mantle length > about 13 mm (Fig. 1a).

Family Gonatidae (Plate I)

Terminal heart-shaped fins. Arms with four rows of suckers. In the three upper pairs of arms the two central rows of suckers are modified into hooks. Tentacle club with big central hooks and a characteristic fixing apparatus.

Genus GONATUS Gray

With the characters of the family.

2. *Gonatus fabricii* (Lichtenstein). At a mantle length > about 17 mm, the hooks on arms and tentacles are not yet developed. Young animals with a characteristic colour pattern (Fig. 2b, c).

Family Onychoteuthidae (Plate II)

Terminal rhombic fins. Arms with two rows of small suckers. Proximally the club of the tentacles usually has a circular group of suckers modified into a fixing apparatus. Central rows of suckers in the carpal part of the club modified into hooks.

Genus ONYCHOTEUTHIS Lichtenstein

Back of the head with a system of longitudinal skin folds. Front part of the funnel pit more or less pointed.

3. *Onychoteuthis banksi* (Leach). Tentacle club in juvenile specimens with four rows of suckers. In more advanced stages the suckers are modified into a proximal circular fixing apparatus and a carpal part with the two central rows of suckers modified into long hooks while the lateral rows degenerate (Fig. 3b).

Family Histioteuthidae (Plate II)

Head and arms big. Mantle short and conical terminal semicircular fins reaching beyond the hinder end of the mantle. Eyes asymmetrically developed. Especially the ventral surface of the animal with a regular pattern of oval light organs.

Genus CALLITEUTHIS Verrill

With weakly developed umbrella.

4. *Calliteuthis reversa* Verrill.

Genus HISTIOTEUTHIS Orbigny

With a strongly developed umbrella occupying more than 50% of the length of the arms.

5. *Histioteuthis bonelliana* (Ferrussac). Umbrella well developed at a mantle length > about 10 mm.

Family Brachioteuthidae (Plate II)

Terminal rhombic fins. Arms with two rows of suckers. 1st and 4th pair of arms feebly developed. Tentacle club slender the proximal part with a great number of small densely set suckers, the distal part with 5-6 longitudinal rows of big suckers.

Genus BRACHIOTEUTHIS Verrill

With the characters of the family.

6. *Brachioteuthis riisei* (Steenstrup). Characteristic are four pigment spots upon the head.

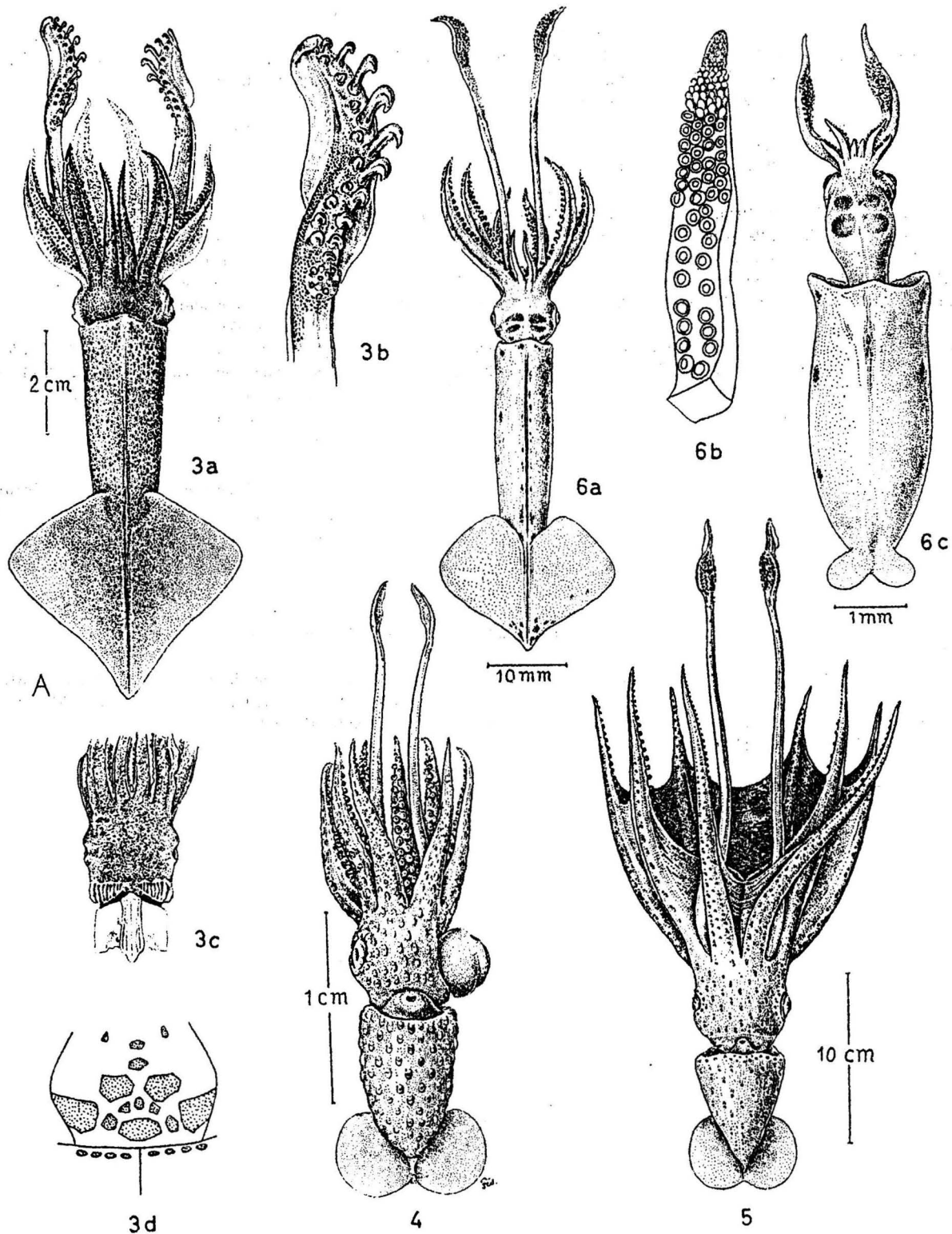


PLATE II

3. *Onychoteuthis banksi*; a, adult animal; b, tentacle club; c, back of the head of adult; d, chromatophores of the back of the head at mantle length 9–10 mm. — 4. *Calliteuthis reversa*. — 5. *Histoiteuthis bonelliana*. — 6. *Brachioiteuthis riisei*; a, adult animal; b, tentacle club; c, larva. (Fig. 3c from PFEFFER; Figs. 3d and 6b from DEGNER; remainder original).

Further Information on Identification

1. *Octopoteuthis sicula*: ADAM, 1952, p. 71, Fig. 28. DEGNER, 1925, p. 14, Fig. 8. NAEF, 1923, p. 334, Textfigs. 163-167. PFEFFER, 1912, p. 213, Pl. 19, Figs. 1-16.
2. *Gonatus fabricii*: DEGNER, 1925, p. 7, Figs. 2-4. NAEF, 1923, p. 244, Textfigs. 114-116. PFEFFER, 1912, p. 230, Pl. 15, Figs. 17-24.
3. *Onychoteuthis banksi*: DEGNER, 1925, p. 10, Figs. 5-7. JAECKEL, 1958, p. 587, Fig. 58. NAEF, 1923, p. 313, Textfigs. 153-157. PFEFFER, 1912, p. 70, Pl. 3, Figs. 13-25; Pl. 4, Figs. 1-5; Pl. 5, Figs. 1-15; Pl. 6, Figs. 1-14.
4. *Calliteuthis reversa*: DEGNER, 1925, p. 20, Figs. 11-13. NAEF, 1923, p. 352, Textfigs. 173-180, Pl. 3, Fig. 5. PFEFFER, 1912, p. 250, Pl. 20, Figs. 1-10; Pl. 21, Figs. 1-14; Pl. 22, Figs. 1-8. VOSS, 1962, p. 169, Figs. 1-3.
5. *Histioteuthis bonelliana*: DEGNER, 1925, p. 16, Figs. 9, 10. NAEF, 1923, p. 362, Textfigs. 182-185, Pl. 3, Fig. 2. PFEFFER, 1912, p. 297, Pl. 23, Figs. 1-10; Pl. 24; Pl. 25.
6. *Brachioleuthis riisei*: DEGNER, 1925, p. 44, Figs. 34, 35. JAECKEL, 1958, p. 595, Fig. 62. NAEF, 1923, p. 370, Textfigs. 186, 187. PFEFFER, 1912, p. 355, Pl. 26, Figs. 1-20; Pl. 27, Figs. 1-9.

Distribution

Species
(Species in brackets occur only exceptionally)

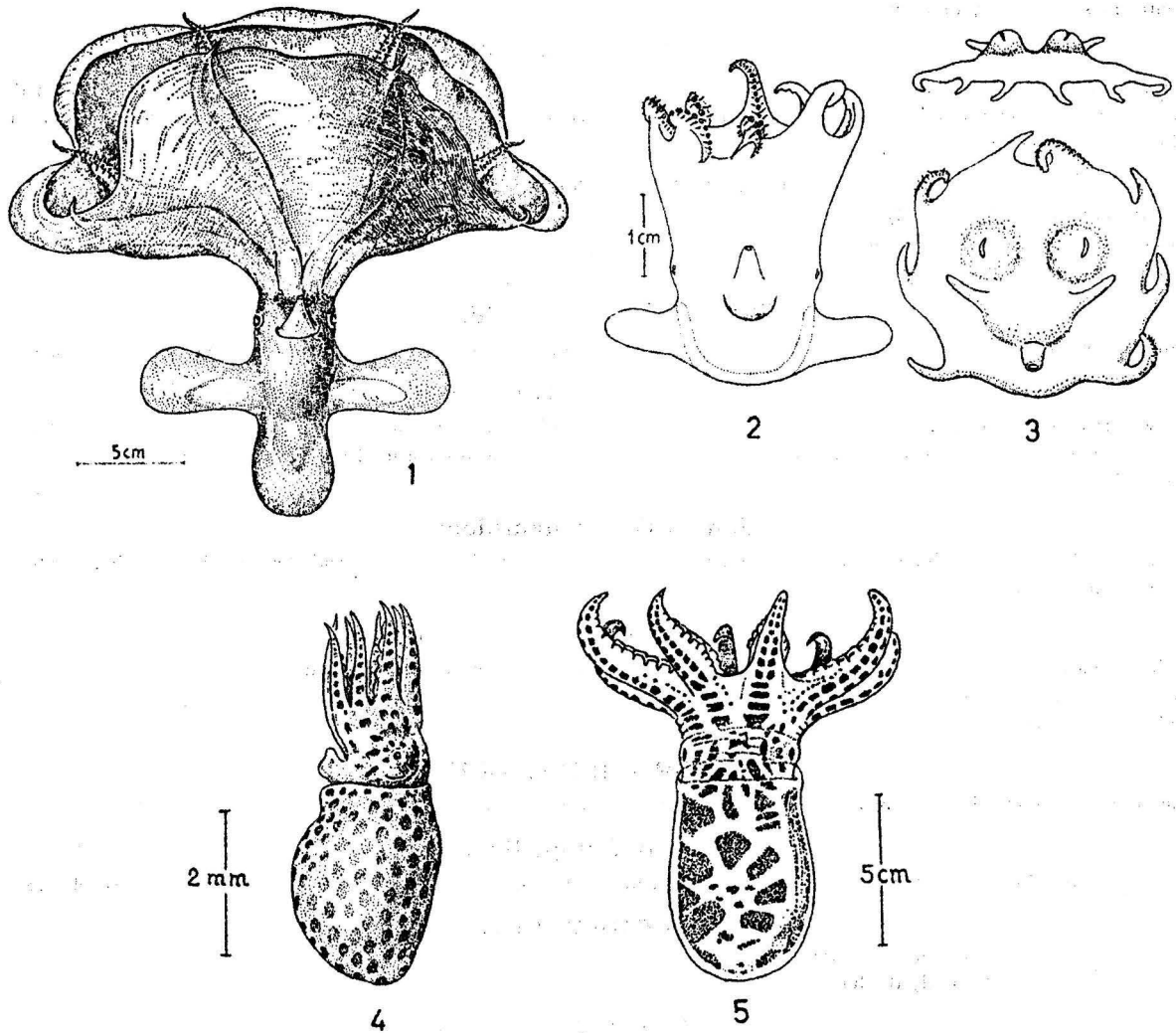
Gulf of Bothnia.....	—
Gulf of Finland.....	—
Baltic proper.....	—
Belt Sea.....	(3)
Kattegat.....	3
Skagerak.....	2, 3, (6)
Northern North Sea.....	2, 3, 6
Southern North Sea.....	(3)
English Channel (eastern)...	(3)
English Channel (western)...	(3)
Bristol Channel and Irish Sea	(3)
South and West Ireland and Atlantic.....	1, 2, 3, 4, 5, 6
Faroe-Shetland Area.....	1, 2, 3, (4), 6
Faroe-Iceland Area.....	1, 2, 3, 6
Norwegian Sea.....	2, 3
Barents Sea.....	2, 3

References to Work on Biology

are so few and scattered that they have been disregarded for this sheet.

References

- | | |
|---|---|
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|---|---|



1. *Cirroteuthis mülleri*. — 2. *Grimpoteuthis* sp. — 3. *Opisthoteuthis* sp.; dorsal and front view. — 4. *Eledone cirrosa*. — 5. *Octopus vulgaris*.

(Fig. 1 from MUUS; Figs. 2 and 3 from GÜNTHER and DECKERT; Figs. 4 and 5 from REES).

ORDER OCTOPODA¹⁾

With eight arms. Suckers not stalky and without chitinous armature. Head and mantle fused dorsally leaving open a more or less restricted ventral mantle aperture.

SUB-ORDER CIRROMORPHA

Body short and saccular. With one pair of fins. The mantle aperture reduced to a narrow slit at the base of the funnel – in some species totally absent. For most of their length the arms are connected by a thin membrane forming a web. Arms with a single row of suckers. Alternating with the suckers are paired cirri.

Family Cirroteuthidae

Mantle aperture narrow but not completely closed round the base of the funnel. The arms are directly connected with the web at their bases and tips only. The middle part of the arms are secondarily connected with the web by means of septa. Inner shell-vestige which supports the fins is saddle-like.

Genus CIRROTEUTHIS Eschricht

With the characters of the family.

1. *Cirroteuthis mülleri* Eschricht. The fins are usually longer than the head is wide. The cirri are 5–7 times as long as the diameter of the suckers (Fig. 1).

Family Stauroteuthidae

Mantle aperture closely fitting the funnel or absent. The web is simple or "secondary". Inner shell-vestige U- or V-shaped.

Genus GRIMPOTEUTHIS Robson

The web is simple. The cirri are usually only little longer than the diameter of the suckers. The large number of badly known species within this genus makes safe identification impossible. *G. grimaldii* (Joubin) has been recorded from the Faroe-Iceland area.

2. *Grimpoteuthis* sp. (Fig. 2).

Family Opisthoteuthidae

The body is flattened, lens-shaped. The fins are much reduced. The shell-vestige is a simple rod. The length of the cirri hardly exceeding the diameter of the suckers.

Genus OPISTHOTEUTHIS Verrill

With the characters of the family. This genus includes several badly known species and the reader is referred to the literature. *O. agassizi* Verrill has been taken off Ireland.

3. *Opisthoteuthis* sp. (Fig. 3).

SUB-ORDER INCIRRATA

The body has no fins. The web is usually shallow. The arms devoid of cirri.

Family Octopodidae

The radula usually with multicuspidate rhachidian and simple laterals. Most species with a W- or VV-shaped funnel organ.

Genus OCTOPUS Lamarck

With suckers in two rows. Ink-sac present.

4. *Octopus vulgaris* (Lamarck). Only the larvae are pelagic.

Genus ELEDONE

With suckers in one row. Ink-sac present.

5. *Eledone cirrosa* Lamarck. Only the larvae are pelagic.

1) Most bathypelagic octopods are insufficiently known and their taxonomy in a hopeless state of confusion. Occasional captures of other octopods than here mentioned are to be expected.

Further Information on Identification

1. *Cirrotheuthis mülleri*: ROBSON, 1932, p. 130.
2. Genus *Grimpoteuthis*: ROBSON, 1932, p. 136.
3. Genus *Opisthoteuthis*: ROBSON, 1932, p. 167.
4. *Octopus vulgaris*: NAEF, 1923, p. 695, Textfigs. 400-402, 412. REES, 1950, p. 361, Pl. 1-2.
5. *Eledone cirrosa*: JAECKEL, 1958, p. 562. REES, 1956, p. 283, Pl. 10, Figs. 5, 6.

References to Work on Biology

(Numbers after references give species referred to)
 GRAVELY (1908) 5. RACOVITZA (1894) 4. REES (1950)
 4. REES (1956) 5. REES and LUMBY (1954) 4.

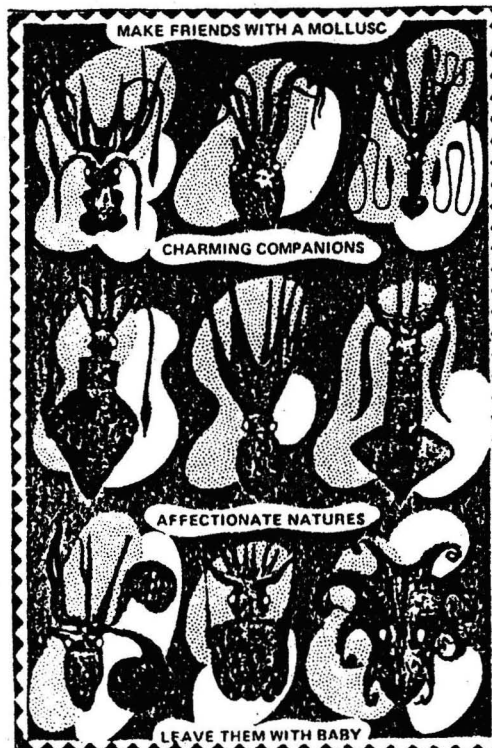
Distribution

Species
 (Species in brackets occur
 only exceptionally)

Gulf of Bothnia.....	—
Gulf of Finland.....	—
Baltic proper.....	—
Belt Sea.....	—
Kattegat.....	5
Skagerak.....	5
Northern North Sea.....	(4), 5
Southern North Sea.....	4, 5
English Channel (eastern)...	4, 5
English Channel (western) ..	4, 5
Bristol Channel and Irish Sea	4, 5
South and West Ireland and Atlantic.....	2, 3, 4, 5
Faroe-Shetland Area.....	5
Faroe-Iceland Area.....	1, 5
Norwegian Sea.....	1, 5
Barents Sea.....	—

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'Arm in arm in arm' - Copyright People's Police, London, 1981

THE STATUS OF HELIX OMALISMA BGT. (PULMONATA: DISCIDAE)

The following account of Helix omalisma does not contain the vigorous argumentation necessary for a polished scientific paper and is anecdotal in style. Sooner or later the variation in Discus rotundatus will undoubtedly be studied in more detail with a statistical analysis of populations and it is felt that the following account will save a great deal of preliminary investigation on the part of future researchers.

Abstract: Helix omalisma Bgt. is treated as a 'weak geographical race' of Discus rotundatus (Müll.) not worthy of formal naming. Slight differences between the anatomy of northern and southern British and European populations of D. rotundatus are reported.

On the 21st. June 1968 my wife and I camped on the site of a disused railway line just south of Cahors by the N 653 (France, Lot). The site, being scattered with masses of limestone blocks, proved very productive of snails. Amongst those found were two specimens of a Discus very much more depressed than normal D. rotundatus (Müll.) and with a very much wider umbilicus. At the end of the holiday I found that I no longer had the specimens, having either lost them or let them go, they having proved to be alive. I had thought that so distinctive a shell could easily be named from memory. Having to my surprise not found any illustration in Germain's volume in the Faune de France (1930) I searched through the European Discus in the British Museum (Natural History). When this yielded no results I began to wonder if my memory of the shells had played me false. There matters rested until I had a chance to visit Cahors again. In the summer of 1980, whilst in France, I made a special effort to find the same locality again and was fortunate enough to do so and, after a prolonged search, material of the Discus was found, although rather sparingly including only three live specimens which were preserved in spirit after drowning outstretched. Associated species were Cochlostoma septemspirale, Pomatias elegans, Granopupa granum, Abida secale, Vallonia excentrica, Jamininia quadridens, Ena obscura, Zebrina detrita, Phenacolimax major, Oxychilus draparnaudi, Cochlodina laminata, Clausilia parvula, C. bidentata, Helicella itala, Trochoidea geyeri, Hygromia limbata, Trichia hispida and Helicigona lapicida.

The specimens have similar colouring to D. rotundatus but differ totally in shape, as may be seen from the accompanying figures (fig. 1A, 1B-M and fig. 3). Dr. Kerney, to whom I sent a specimen, thought it likely it was an extreme variant of D. rotundatus but commented on the obvious counter argument that all the material found was identical and that typical D. rotundatus did not occur there. He has, however, occasionally come across similar shells when sorting through hundreds of fossil specimens. It was of course extremely unlikely that this distinctive variety had not been discovered and named in France and a search in the literature revealed at least two possible names: Fleming (1828: 269) described a Helix turtoni based on Helix rotundata Turton (1819:53) non Müll. This variety is described and/or figured by numerous authors, e.g. Turton (1831:59) (as H. rotundata var. B), Moquin-Tandon (1855, 2:107), Tryon (1885, 3:27) and Taylor (1909, 3: 186, fig. 241). From these references and named material in the British Museum it is clear that var. turtoni is merely a very minor variant of D. rotundatus with a much flatter spire but it is in no way similar to the shells from Cahors. Moquin-Tandon's reference (1855, 2: 108) to var. turtoni occurring near Nimes must, however, refer to a specimen of omalisma. Germain (1913, 2:83, 1928:53 and 1930:168) mentions Helix omalisma Bgt. as a variety "plus déprimée avec un ombilic un peu plus ouvert" or "plus elargi" but does not figure it. He gives the distribution as "ça et là avec le type, surtout dans le Midi et la région pyrénéenne." The phrase "peu plus ouvert" is not adequate to describe the very wide umbilicus of the Cahors shells in which it is much as in D. perspectivus

although that has it even slightly wider. D. perspectivus, however, lacks the striped colour patterning, has a distinct spiral groove running around the under-side parallel with the keel and a totally different distribution. Reference back to older works and to the original description strongly suggested that the Cahors shells were identical with Helix omalisma Bgt. Locard (1894:135) described this as follows "Tres deprime, aplati en dessus, légèrement bombé en dessous; 6 tours presque plans le dernier pas plus grand que le précédent, un peu dilaté, non déclive caréné au milieu convexe-gonflé en dessous; ombilic plus large; même ouverture test plus grisâtre H 2 D 6. Rare: region pyrénéenne Haut Garonne, Dordogne etc." This is very little different from the original description which I repeat here: "Testa latissime ad summum umbilicata, depressa, vix convexa, costis regularibus, curvatis, eleganter ornata; -spira perdepressa; apice parvo, obtuso, vix mamillato; -anfractibus 6 subplanulatis lente ac regulariter crescentibus, sutura impressa separatis; ultimo non majore, ad aperturam dilatato, non descendente, supra fere plano, in medio carinato, infra convexo, tumido; -apertura obliqua, transverse lunata, marginibus convergentibus; -peristomate recto simplici acuto. Alt. 2 -Diam. 6 millim. Espèce du groupe des Helix rotundata Müller; abietina Bgt. etc. caractérisée par une spire presque plane en dessus à l'encontre de ses congeneres. Au quartier de Caraman commune d'Avignonet. Tryon (1885:27) places H. omalissima Bgt. (sic) in a list of unfigured and undetermined species of Helix group Patula section Discus.

I wrote to M. Cl. Vaucher at the Muséum D'Histoire Naturelle, Geneva asking if Bourguignat's types were there and he very kindly sent me the two specimens in Bourguignat's collection, one from Périgueux, France and the other from Montserrat in Spain. These correspond exactly with the specimens from Cahors. They cannot, however, be the true types since neither comes from the type locality mentioned by Bourguignat in Fagot, 1879. In order to investigate the distribution of this distinctive taxon I examined, through the kindness of M. S. Tillier, all the lots of Discus preserved in the Laboratoire de Malacologie, Muséum D'Histoire Naturelle, Paris. Out of 172 lots 11 were identical with or very similar to the Cahors shells and some were intermediate. In as far as I have been able to locate the localities all the data obtained from the examination are recorded on the map (Fig. 2) but to save space they are not listed in detail. Several lots consisting only of juvenile shells have been ignored although several are almost certainly omalisma. After this account had been written I was in Leiden in November 1983 and Dr. Gittenberger allowed me to examine the very extensive material of Discus rotundatus preserved in the Rijksmuseum, Leiden and as many of the records as possible have been added to the map. Only very few examples of omalisma were present in these collections.

The three Cahors specimens preserved in spirit were dissected and their anatomy compared with that of specimens of D. rotundatus from my own garden at Kimbers, Maidenhead (Fig. 1 A, B, C, D). No significant differences were detected other than a slenderness in all organs in the Cahors material which is unquestionably directly correlated to the compression of the shell, there being far less room in the whorls in comparison to the taller less compressed shells from Maidenhead. The two shells are, however, figured for comparison (Fig. 1 K, L, M). Likewise, nothing significant was observed in the radulae. During the unravelling of the penial retractor of one of the Cahors specimens numerous linear worms were found which Dr. D. I. Gibson of the British Museum kindly identified as larval nematodes, possibly metastrongyloids. One curious fact did, however, emerge from the comparison of the specimens when I referred to previous accounts of the anatomy of Discus rotundatus. In both the Maidenhead and the Cahors material the spermathecal duct is longer so that the spermatheca itself is situated well beyond the distal end of the albumen gland whereas Steenberg (1911:77, figs. 68-71), Taylor (1907-14, 3:186, fig. 237) and Moquin-Tandon (1855 Atlas pl.10, fig. 10) all show the spermatheca situated well before the distal end of the gland. Through the kindness of T. Schiøtte of the University Zoological Museum, Copenhagen I have

been able to examine Danish material including some from Frederiksdal which is possibly the type locality of rotundatus, although Müller (1774:30) merely states "Daniae vulgaris, Norvegiae rarior" without any precise localities. Two of Taylor's unpublished drawings are similar to the published one and Adrian Norris kindly sent me xerox copies of them. The dissections were the work of J.W.Neville from specimens collected by G. Barrett-Hamilton; the jaw and radula drawings were prepared from material collected in Wexford but no details are given about the provenance of the specimens used for the genitalia drawing although they too may well have come from Ireland. Dissection of the Danish material from Frederiksdal, Hareskor and Sigteprøve confirmed Steensberg's drawing as would be expected and in each case the spermathecal sac did not reach the distal end of the albumen gland. Material was also kindly loaned to me from the British Museum (Natural History) by Dr. P. Mordan; both that from Box Hill and that from France, Pyrénées Atlantique, 1 km. N. of Caresse, 43° 28' N, 1° 00' W, had the same anatomy as Maidenhead specimens (Fig. 1 G, H, I, J). The Pyrenean specimens were somewhat flatter than typical D. rotundatus and somewhat intermediate with omalisma. A specimen from the marshes by the R. Thames in front of Syon House, Isleworth had the tips of the sac and the gland at approximately the same level. During a visit to Scotland in 1982 I collected several specimens of D. rotundatus in Perthshire along the A822 at Drumoury and Dullator and dissection of these showed them to have exactly the same anatomy as the Danish specimens. Dr. E. Gittenberger (Rijksmuseum van Natuurlijke Historie) kindly sent me some specimens from the Netherlands for examination and these agree in their anatomy with the Danish material. He also sent omalisma from the R. Lot and a similar form from Valvidrere, 2 km. W. of Barcelona, remarkably large, up to 7.8 mm. wide, some specimens quite depressed but others very distinctly raised. A great many more specimens from a range of localities need to be dissected to show if this small anatomical difference is truly geographically correlated.

My original conclusion was that despite the existence of intermediate specimens the very flattened Discus could be treated as a geographical race of rotundatus but various fellow workers have convinced me that, despite the very marked differences separating extreme populations and the apparent purity of some of these, nevertheless too many intermediates exist for this to be a wise course, although I have absolutely no doubt that there is a geographical correlation. The name omalisma is therefore placed in synonymy with rotundatus.

Discus rotundatus (Müll.) 1774 "weak geographical race" omalisma* (Bgt, 1879) (of no formal nomenclatural status)

1879 Helix omalisma Bgt.: in Fagot: 289

1885 Helix omalisina (sphalm.) Tryon: 27

1893 Pyramidula omalisma Pilsbry: 47

Typical material of "omalisma" has been seen from Ariège, Basses-Alpes, Bouches-du-Rhône, Dordogne, Haute Garonne, Lot, Savoie, Hérault, Gard, and Tarn and additional intermediate material from Ardèche, Charentes Maritimes and Gard.

One possible explanation is that omalisma was formerly much more distinct, having evolved by isolation but has since, due to removal of constraints introgressed again with typical rotundatus; on the other hand omalisma may be an eco-type but detailed examination of the habitats and breeding work could soon establish the correctness or otherwise of this possibility.

Undoubtedly variation in this species merits further study. No matter how Darwin's evolutionary concepts are questioned in the light of an immense amount of subsequent research and discovery and new methods of approach, there is no question that at least a significant part of the evolution of taxa has been by the

*To be treated as a noun in apposition if ever used at formal subspecific level.

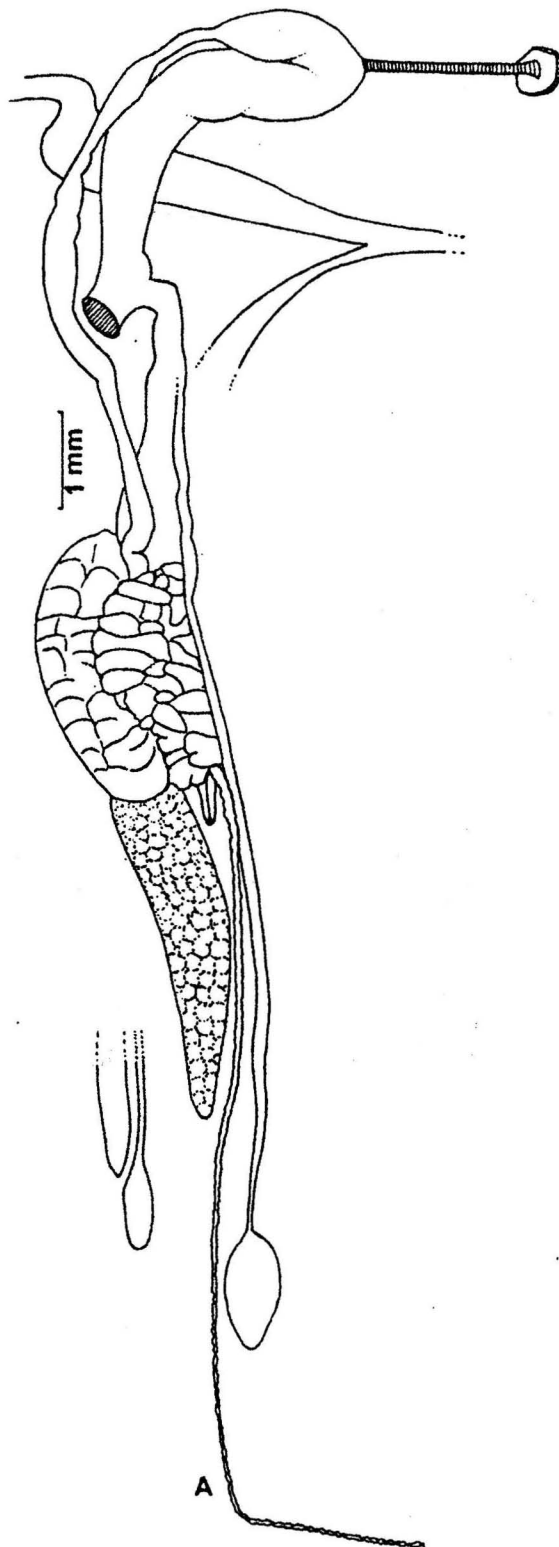


FIGURE 1

Discus rotundatus, Kimbers, Maidenhead, Berks., genitalia.

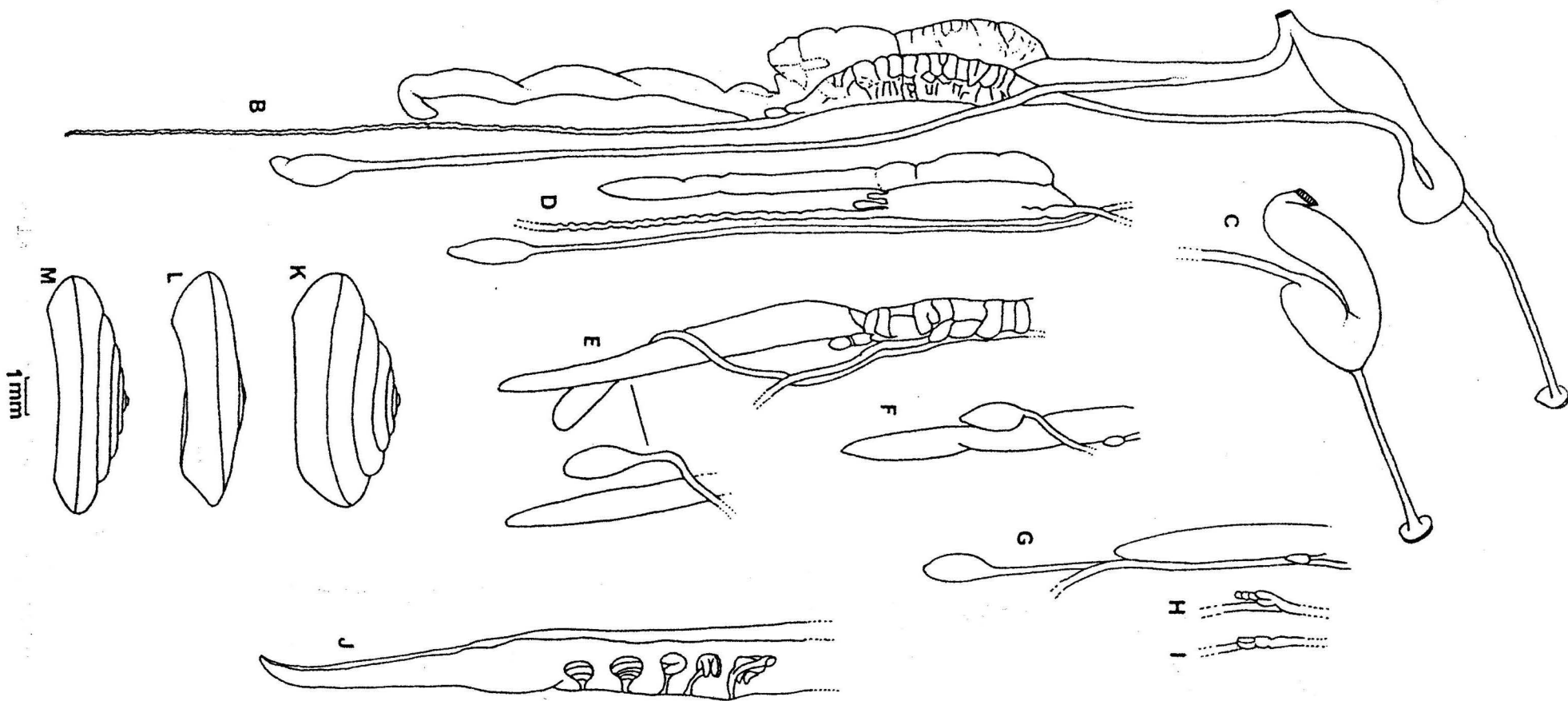


FIGURE 1 B-M

- B. Discus rotundatus ("omalisma"), Cahors, Lot, France, genitalia.
 C, D. Ditto, parts of genitalia of another specimen.
 E. Discus rotundatus, topotype ? from Frederiksdal, Nord jaelland, Denmark, part of genitalia.
 F. Discus rotundatus, Sigteprøve af løv, Denmark, part of genitalia.
 G, H, I, J. Discus rotundatus, Carresse, Pyrenees, France, parts of genitalia, talon and liver with hermaphrodite gland.
 K. Discus rotundatus, Kimbers, Maidenhead, Berks., shell.
 L, M. Discus rotundatus ("omalisma"), Cahors, Lot, France, shells.

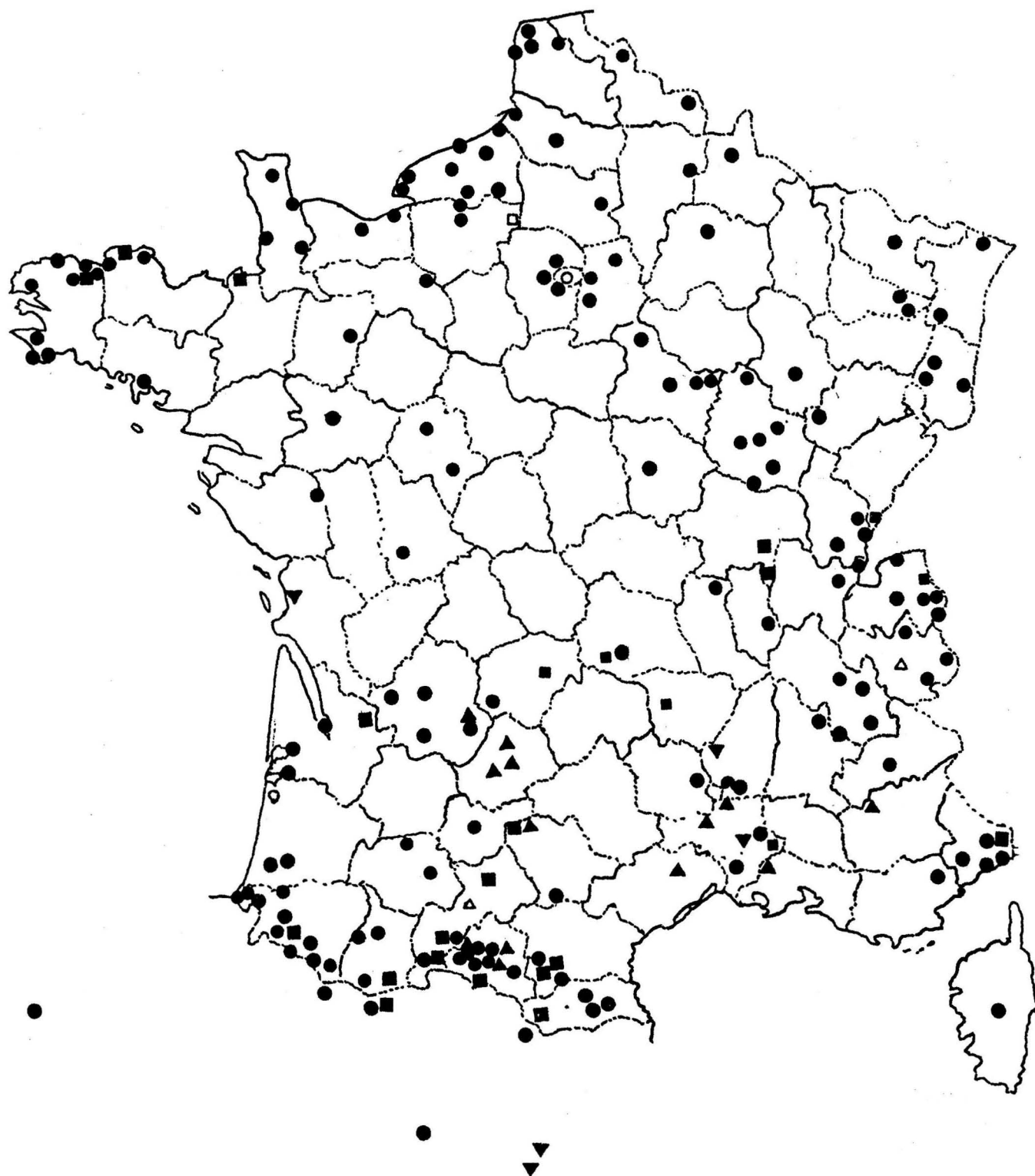


FIGURE 2. Map showing distribution of Discus rotundatus ("omalisma")

- Typical rotundatus
- ▲ Typical variant omalisma
- △ As last but accurate to department only
- Intermediates or juveniles
- ▼ Other variants but not true omalisma
- Pleistocene variant with wide umbilicus
- Quaternary record of typical rotundatus

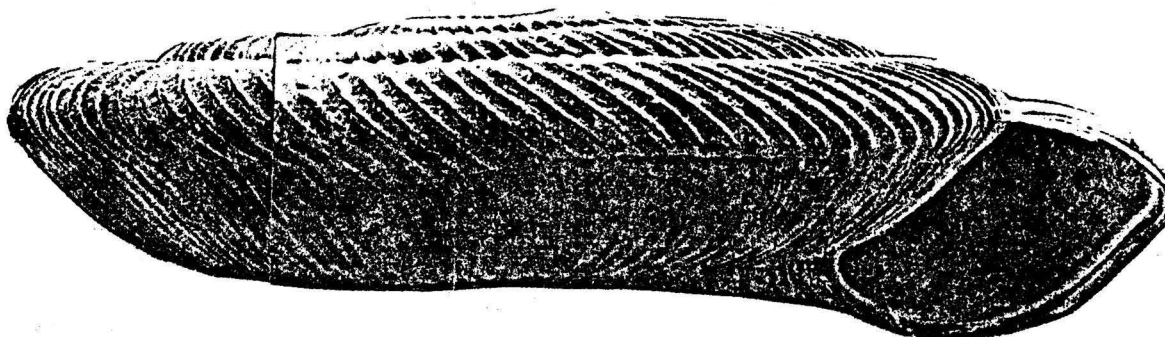


FIGURE 3

Discus rotundatus ("omalisma"), Cahors, Lot, France, shell,

low power scanning electron micrograph x25

[courtesy of Dr. A. Solem, Field Museum of Natural History, Chicago]

action of selection on small variations. Variation is unquestionably of great importance, particularly in the evolution of common widespread species and their satellites. The rules of nomenclature give no way of covering some of this variation. The word variety is nondescript but should cover simple genetic variants; rather it covers taxa derived in a multitude of different ways. The word subspecies is more rigid, at least in Zoology implying a geographical separation or some other separation e.g. altitudinal or ecological, the taxa normally merging at the boundaries or if quite disjunct then at least theoretically capable of interbreeding. To sink taxa such as omalisma without trace leads to a considerable loss of information and I feel some such loose concept as a weak race, either just emerging or being eliminated by introgression is a valid one even if not covered by the rules.

My thanks are due to Dr. Gittenberger for allowing me to examine the material in the Rijksmuseum, Leiden and for discussing the problem, also for drawing my attention to Germain's paper on Helicidae.

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Bernard Verdcourt, [REDACTED], Maidenhead, Berks.

REVIEWS

Collectible Shells of Southeastern U.S., Bahamas and Caribbean by R. Tucker Abbott, 64pp., 103 Colour pls., paper back, 1984 American Malacologists, Inc. Regular edition \$4.95: waterproof plastic-paper edition \$8.95.

The release of another publication by this well-known author of books on the mollusca is always an event to be awaited with pleasurable anticipation, and this well-produced guide maintains the high standard which one has come to expect. The majority of the shells are photographed against a black background, with the popular name, scientific name with author and date, habitat and frequency of occurrence displayed in white immediately below each specimen, an admirable arrangement. Most of the 300 species illustrated are common ones, but some rarities are represented, as are a few of the living molluscs. The shells are grouped in families, with the popular name for the family boldly displayed on each page, together with a few relevant and informative details. A few examples of nudibranchs, cephalopods, chitons, fresh-water shells, tree snails and fossil shells which may be encountered in the area designated complete the molluscan picture, and in addition there is useful information about collecting, cleaning and storing shells. There are even two pages illustrating other forms of marine life which may be found on the beach, such as starfish and sea-urchins. Finally, the usefulness of the book is enhanced by the provision of a short bibliography and an index.

Any visitor to the southeastern United States and the Caribbean who wishes to learn something about the shells to be seen there will find this small volume an ideal companion for a stroll along the beach, a special edition with waterproof and tearproof pages being obtainable at a somewhat higher but still very moderate figure. To avoid confusion, it should be stated that this book has also been published under the title 'Collectible Florida Shells', for the Florida tourist trade. For those unacquainted with the many facets of our hobby, a photograph of a typical annual shell show is inserted, and should stimulate interest, but although it is stated that there are friendly shell clubs in many Florida cities it is left to the reader to discover how to get in touch with them.

It only remains to say that this book is excellent value for money, that the information given is accurate and the photography first-class, and that both the novice and the advanced collector should benefit and derive much enjoyment from browsing through its pages.

R. P. Scase

Doreen Sharabati: Red Sea Shells. 127pp + 49pls.
KPI Ltd., Routledge & Kegan Paul Plc., London 1984. Price: £10.00

This well-produced and reasonably priced little book, printed on high-quality paper, with a flexible plastic cover and many excellent colour photographs is a welcome addition to the growing number of guide books aiming to help the identification of shells collected in specific areas. The bulk of the book is taken up by 49 full-page colour photographs illustrating about 500 species with the accompanying text facing the plates. The shells are grouped in families, with a short introductory paragraph summarizing the main characteristics of each family. Nearly 80% of the illustrated shells have been identified, these are given their current scientific names, complete with author and year of publication. For many shells there is also a short description pointing out features not obvious from the figures, and the average size of the largest dimension of the shell is given in mm. The majority of gastropod shells are shown both from the dorsal and the ventral sides, while for bivalves a view is usually given of both the exterior and the interior of the valves.

The first 33 plates are largely devoted to prosobranch gastropods (361 species) with a few cephalopods, chitons and scaphopods added to them (9 species). Their text was written by Doreen Sharabati who also wrote the introductory chapters on the classification of shells and the marine fauna of the Red Sea, as well as the concluding chapter on collecting and cleaning shells. Plates 34-37 illustrate the opisthobranch gastropods (31 species), the text for this section was compiled by Nathalie Yonow. Finally, plates 38-49 deal with the bivalves (103 species), the text of this section is the work of Solene Morris.

The most successful part of the book is the bivalve section where about 95% of the illustrated shells have been identified and only a few species name endings need adjustment (e.g. Juxtamusium maldivensis should read J. maldivense, etc.). A very useful feature of this section is the provision of a small sketch for each family, showing the valve interior, the lay-out of the hinge and the scars of the adductor muscles. Several of the bivalves illustrated here cannot be found in any currently available shell book.

Rather less successful is the large section on prosobranch gastropods where only about 75% of the illustrated shells have been correctly identified, though the rate varies enormously among the various groups. Of the larger families popular with collectors, the Strombidae, Cypraeidae, Cymatiidae and Conidae are reasonably well covered and most identifications follow current usage, though few people will agree with the author in attributing the cone shells on pl.28, fig.3 and pl.30, fig.2 to the same species. There are more problems with the Muricidae-Thaididae-Coralliophilidae group. To start with, the quality of some of the specimens illustrated here is well below the general standard of the book. One of the worst examples is the Murex scolopax specimen shown on pl.17, fig.2: it is a wreck of a specimen with every single spine broken off, quite unsuitable for identification. The specimens used to illustrate Homalocantha digitata, Pterynotus tripterus etc. also leave much to be desired. And there are a couple of mistakes: Aspella producta should be among the Muricidae, not the Thaididae, Murexiella martini has two spelling mistakes in its name both on pl.19 and in the Index, the generic name Coralliophila is misspelt three times on pl.20 and several times in the Index. The shell on pl.17, fig.8 is not Homalocantha pele, but H. fauroti Jousseaume, 1888 and the shell on pl.18, fig.3, 3a is not Naquetia annandalei, but N. trigonulus Lamarck, 1816.

The coverage of the family Olividae is hardly adequate, the two specimens illustrating Oliva bulbosa on pl.24 do not do justice to the great variability of this species. The name of Ancilla cinnamomea is misspelt both on pl.24 and in the Index. But more importantly, this is an Indian species which does not live in the

Red Sea. The shell illustrated on pl.24, fig.5 is probably A. albisulcata Sowerby, 1830. There are several unsolved identification problems in the Mitridae-Costellariidae group as well. Also, the name of Vexillum amabile is misspelt both on pl.26 and in the Index, and of the three specimens used to illustrate Neocancilla pretiosa on pl.27, fig.1, only the last two represent that species. There are many more identification problems in the less popular families.

From the purely taxonomic point of view the least successful part of the book is the short section covering the opisthobranch gastropods where only half of the illustrated species have been identified. However, most of the illustrations are excellent.

The introductory and closing chapters of the book contain much useful information. There is also an illustrated glossary, a short bibliography and a very good Index, listing each species twice, once under its specific name and then again under its generic name. With the exception of a few opisthobranch photographs taken by Nathalie Yonow, all other photographs were taken by Issam Sharabati. The shells are shown against a dark background which brings out the true colour of the specimens and there is enough detail in most figures to allow identification.

All in all, this is a very useful guide book to Red Sea shells and its few shortcomings can be easily put right in future editions. Meanwhile, it deserves a place in the library of everybody interested in Red Sea shells. It is a genuine stop gap, if there is such a thing.

E. Sándor, 14.2.1985

'Exploring Underwater in a Cornish Estuary' by Victoria Stone and Mark Deeble - a Porth Books paperback published 1984, price £4.95.

Having spent two weeks of the last half dozen summers on holiday in Cornwall exploring rock pools, sifting through strandlines and donning my wetsuit to snorkel in and around the Lamellaria zone at ELWST, I was favourably disposed towards a book entitled 'Exploring Underwater in a Cornish Estuary'.

I like the format of the book and the quality and overall presentation is pleasing. The text is by a zoologist who knows the area covered well since he fished the estuary for several years and Victoria Stone was a 1984 Kodak bursary winner. All the photographs were taken in the Roseland Voluntary Marine Conservation Area and in the Fal Estuary or nearby in Falmouth Bay.

A book of this size and type (24 x 21 cm, 47 pages) does not aim to be comprehensive. It is divided into short sections on ten marine phyla, each phylum being represented by a handful of examples. Only the animal kingdom is covered and I was sorry not to find a plate or two including some of the dainty and brightly coloured algae which inhabit Cornish waters. Mollusca and crustacea receive a comparatively generous allowance of text and photographs.

The text is clear, straightforward and informative. In the case of the decapod crustaceans it can be quite entertaining too, conveying to the reader something of the character of these creatures - call it 'crabrisma'! The degree of scientific information puts this book beyond the needs of the very casual observer but is not such that it renders it a textbook.

At the end of the book there is a short section on Conservation in Marine Habitats - surely an increasingly important aspect of the marine scene from the

conchologist's point of view. Finally, a very useful Appendix giving details of all the equipment used for the photographs and an Index to species illustrated.

One of the book's editors emphasises the strong photographic element of this book and it is this aspect of the book which raises most doubts in my mind. Undoubtedly some of the photographs are stunning, showing as they do the vivid colours lit by the flash equipment that was used. The photogenic nudibranchs and anemones come out particularly well and there is an entrancing photograph of Simnia patula (locally known as the 'pasty shell') feeding on Alcyonium digitatum. However, I feel greater care could have been taken in the choice of photographs for inclusion and a degree of reduction of the content of the plates has taken place because there are instances where the captions do not reflect the actual subject matter of the picture they are describing. An example of this is page 9 where instead of "an encrusting orange crater sponge (Hemimyscale columella) surrounding jewel anemones Corynactis viridis" there is an enlargement of a portion of Corynactis viridis itself!

In the case of 3 of the 4 full page plates I do not feel the degree of focus that was achieved is crisp enough. In particular the plate on page 26 of a barnacle caught in the act of feeding and encrusted with a bryozoan is so fuzzy that it resembles a piece of tripe. And what about that tiny snail tucked down in the right-hand corner which fails to receive a mention?

The publishers state that this book has been distributed in bookshops in Devon and Cornwall and this will be its main market. However, for devotees of the Cornish coast, particularly those who are not fortunate enough to live in Cornwall permanently, this book is an attractive reminder of the wealth and beauty of the marine fauna that still abounds in that part of the country - but it would sit more happily on one's coffee table than on the shelves of one's reference library.

Jan Light

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 979th. (Ordinary) Meeting held on 15th. December 1984 at B.M.(N.H.)

In the Chair: Mr. T. Pain with 29 members and friends present

Death of a member: The death of a family member, Mr. R. Cumberland was announced.

Nominations and Elections: 3 full members and 1 family membership

1. Pearce, T.A., Dept. of Paleontology, University of California, Berkeley, CA 94720-2399, U.S.A.
2. Pousa Rodriguez, L., [REDACTED], 15011 a Coruna, Spain.
3. Withrington, D.K.J., [REDACTED], Peterborough, Cambridge.

Family membership

Heybourn, Miss W., B.Sc., [REDACTED], Royston, Herts., [REDACTED]

Lecture: There was no lecture of the day. An open meeting was held entitled 'Not my usual line'. Members brought chosen specimens and gave short talks about them.

Announcements and correspondence: Mr. Pain requested assistance from members with regard to Field meetings for 1985. He asked if members would give him any suggestions for places for Field meetings and also requested volunteers to lead such meetings.

The Secretary announced that the closing date for nominations for members of Council for March 1985 was 31st. December. Nominees and proposers should all be fully paid up members of the Society.

Any other business: A slice of dinosaur bone was auctioned for the benefit of the Society's funds.

The meeting closed at 4.50 p.m.

Members exhibits

J. D. Nunn	Information for members
E. Sándor	Family Coralliophilidae Chenu, 1859
C. J. Chibnall	The Pteropod <u>Cavolinia tridontata</u> (Niebuhr)
J. Llewellyn Jones	Some British favourites - <u>Trivia arctica</u> and <u>monarcha</u> , <u>Ianthina ianthina</u> , <u>Apporhais pespelicani</u> , <u>Clathrus clathrus</u> , <u>Haliotis tuberculatus</u> .
C. Pain	<u>Astraea</u> spp from U.S.A., Caribbean and Mediterranean
P. E. Negus	Palaeozoic Molluscs
T. Pain	The family Etheriidae <u>Etheria</u> Lamarck, 1807; <u>Bartlettia</u> H. Adams, 1866; <u>Acostaea</u> d'Orbigny, 1851; <u>Pseudomulleria</u> Anthony, 1907.
G. Osborn	Book of Sand, with shells from sand sample from Diego Garcia by courtesy of Royal Navy
D. C. Long	Ammonites from Glos.
F. Pinn	Sacred chanks

The 980th. (Ordinary) Meeting held on 19th. January 1985 at B.M. (N.H.)

In the Chair: Mr. T. Pain with 35 members and friends present

Death of a member: The death of Mr. C. D. Drake, member since 1963, was announced.

Matters arising: the Secretary announced that Mr. L. Pousa-Rodriguez, elected as an adult member in December, was in fact a junior member.

Nominations and Elections: 8 full members

1. Clarke, J.C., [REDACTED], Stoke, Plymouth, [REDACTED]
2. Esposito, Mrs. R., [REDACTED], Bath Street, Abingdon, [REDACTED]
3. Fairfax, B.L., [REDACTED], Dudley, West Midlands, [REDACTED]
4. Keen, Dr. D.H., Dept. of Geography, Coventry (Lanchester) Polytechnic,
Priory Street, Coventry, CU1 5FB
5. Lewis, M., [REDACTED], Woodford Green, Essex.
6. Salisbury, Miss C.L., [REDACTED], Winterbourne, Gunner, Salisbury,
Wiltshire, [REDACTED]
7. Watson, T.H., [REDACTED], Holland-on-Sea, Essex, [REDACTED]
8. Wendel, Miss M., [REDACTED], London, [REDACTED]

Lecture: 'Problems with Turrids' by Mr. D. Long

Announcements and Correspondence: Mr. Pain announced that there would be a short sequence displaying the shells of Mr. W. Karo in the programme Horizon : 'The mystery of the left hand' to be shown on BBC2 on February 4th.

The meeting closed at 4.54 p.m.

Exhibits

J. E. Llewellyn-Jones	The British Caecidae
D. C. Long	Turridae and literature
J. Llewellyn-Jones	'Augur' shells; Terebridae, Turritellidae
J. D. Nunn	Information for members
B. Glayzer	Turridae of Kuwait
M. Mitchell	South African Turridae
C. J. Pain	Some British Turrids
B. Colville	Madeiran Snails
E. Sándor	Family Muricidae Rafinesque, 1815
	Subfamily Muricopsinae Radwin & D'Attilio, 1971
T. Pain	Genus <u>Clavator</u> v. Martens, 1860 (Pulmonata- Acavidae)
	Madagascar (endemic)
	Genus <u>Forreria</u> Jousseaume, 1880 (Prosobranchia - Muricidae)
	range: Mugu Lagoon, California to Scammons Lagoon, central
	Baja California 60-100 ft. There is a single living
	species.

GENERAL NOTES

REQUIRED URGENTLY!

A volunteer to serve the Society as Field Meetings Organiser. This is an interesting job which furthers the scientific aims of the Society. The holder is asked to arrange 6 to 8 meetings a year, marine and non-marine. No previous experience required.

If you are interested, please contact the Hon. Secretary, Dr. Julia D. Nunn, [REDACTED], Croydon, Surrey, [REDACTED]

THE ANNUAL GENERAL MEETING OF THE CONCHOLOGICAL SOCIETY

At the A.G.M. on March 16th. Mrs. Beryl Rands was elected President. The following new members of Council were elected: Dr. B. Colville, Dr. D.T. Holyoak, Dr. E. Sándor and Mr. M. Willing. All other Officers and Council members remain unchanged.

THE AMERICAN MALACOLOGICAL UNION will hold its annual meeting on the campus of the University of Rhode Island on 29 July to 3 August next. Papers on molluscs, posters, exhibits, workshops and field trips. Contact Dr. M.R. Carriker, College of Marine Studies, University of Delaware, Lewes, Delaware, 19958, U.S.A.

UNIVERSITY OF LONDON, DEPT. OF EXTRA-MURAL STUDIES, Course for Certificate and Diploma in Field Biology, can include molluscan projects; next Summer School will be held at Juniper Hall Field Centre, near Dorking, Surrey, from 2 to 16 August next. Details of fees, application forms and information from: Miss H. Boone, Dept. of Extra-Mural Studies, University of London, 26 Russell Square, London, WC1B 5DQ

GOWER, LANDSCAPE AND NATURAL HISTORY, a one week residential course at University College of Swansea, South Wales, 14 - 20 July next, in conjunction with University of London and University of Birmingham Departments of Extra-Mural Studies. Leaflets on the above two items available from the Newsletter Editor (stamped addressed envelope please).

EXCHANGE WANTED. Werner Reiske, [REDACTED], DDR - 1407 Lehnitz, East Germany, wishes to exchange shells with members. His particular interest is tropical land snails but also worldwide shells. He has land or freshwater shells of central Europe available. Please write.

NEW PUBLICATION - North Atlantic Nudibranchs, seen by Henning Lemche, Ophelia Supplement no. 2, 180 pages, 69 colour plates from the paintings by Henning Lemche, price 400 Danish kroner (approx. £31). Special £5 discount to members of the Conchological Society. Anyone wishing to purchase a copy should send their order to the Hon. Secretary, Dr. Julia Nunn.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, c/o. British Museum (Natural History), Cromwell Road, London, SW7 5BD. 2 April 1985. ITZN 11/5 A.N.(S.) 133

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the Bulletin of Zoological Nomenclature, volume 42, part 1, on 2 April 1985 and would value comments and advice on them from interested zoologists.

Correspondence should be addressed to the Secretary at the above address, if possible within six months of the date of publication of this notice.

Case No.

- 2340 Spiroglyphus Daudin, 1800 and Stoa De Serres, 1855 (Mollusca, Gastropoda, Vermetidae): proposed suppression of two equivocal generic names.
2331 Homonymy in the families HARPIDAE Hawle & Corda, 1847 (Trilobita) and HARPIDAE Bronn, 1849 (Mollusca, Gastropoda).

R. V. Melville, Secretary

ITZN 59 The following Opinions have been published by the International Commission on Zoological Nomenclature in the Bulletin of Zoological Nomenclature, volume 42, part 1, on 2 April 1985:

Opinion No.

- 1292 (p. 27) Voluta papilio Link, 1807 (Gastropoda): conserved.
1296 (p. 37) Request for the use of the plenary powers to conserve Nettastomella Carpenter, 1865 (Bivalvia) refused.

Direction 117

- (p. 43) Correction of Entry No. 462 in the Official List of Generic Names in Zoology concerning Sphaerium Scopoli, 1777 (Mollusca, Bivalvia) (Correction to Opinion 94).

The Commission regrets that it cannot supply separates of Opinions.

R. V. Melville, Secretary

ARLINGTON COURT SHELL COLLECTION

Members may be interested to know that the National Trust has a fine collection of British marine and non-marine Mollusca at Arlington Court in North Devon. The collection was given to the Trust, along with the Estate, by Miss Rosalie Chichester, and was arranged by Sir Edward Salisbury in 1949. It is housed in two cabinets which are not on public display: an eleven-drawer one with the non-marine material, and a sixteen-drawer one with the marine. There are also exotic specimens on display within the rooms open to the public - these have been catalogued by Stella Turk. The main collection is available for study by interested conchologists by arrangement with the Administrator (Tel. Shirwell 296). The house is open from April to the end of October, Sunday to Friday.

NEWS OF A MEMBER

Dr. Peter Lingwood has been awarded a Winston Churchill Memorial Trust Travelling Fellowship to visit America to study waste disposal. Peter, who is responsible for the day-to-day running of South Yorkshire County Council's landfill and civic amenity sites intends to use this prestigious Fellowship to broaden his experience of waste disposal techniques, especially landfill, in a country which has a different legislative and organisational framework and which has, in many cases, been shown to have encountered problems several years before they have eventually appeared in Britain. The trip will cover various centres such as Washington DC, New York, Cincinnati, Los Angeles, San Francisco. He intends to see both the best and the worst that America has to offer in the waste disposal field.

He would very much like to hear from anyone who can suggest places that must not be missed or recommend helpful contacts. [Dr. P. Lingwood, 8 Sorrento Way, Darfield, Barnsley, South Yorkshire, S73 9RN] phone (work) 0226 241484 ext. 3140.

FOR SALE - Top quality worldwide specimen shells from the common to the very rare. In particular Cypraeidae, Conidae, Volutidae and Muricidae. Enclose stamp for price list. All enquiries welcome. Alistair Moncur, [REDACTED], Camberley, Surrey. Telephone [REDACTED].

DIETER SCHIERENBERG BV, Prinsengracht 485-487, 1016 HP Amsterdam, The Netherlands, specialises in Malacological journals and rare books. Please ask for specialised catalogues and offer us your set of Journal of Conchology.

CHANGE OF ADDRESS - Hampshire Micro, microscope suppliers, have moved to: The Microscope Shop, Oxford Road, Sutton Scotney, Hants., SO21 3JG (telephone: 0962 760228)

A PACK-SLUG!

Browsing through Church Woodcarvings: A West Country Study (by J.C.D. Smith, 1960) I found a splendid photograph of a fifteenth-century misericord in Bristol Cathedral. This showed a poor burdened slug with a pack on its back being whipped to make it go faster. It looks like a big Arion sp.

The caption to the illustration curiously states that the mollusc is a snail, not a slug. In Orkney a slug is usually called a snail; perhaps this is also the case elsewhere?

Nora McMillan, Merseyside County Museums, Liverpool

THE CONCHOLOGISTS' NEWSLETTER

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September 1985

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MORPHOLOGY AND FUNCTION IN THE MOLLUSCAN FAMILY PECTINIDAE

Members of the family Pectinidae - popularly known as scallops - are among the most successful and most widely distributed marine molluscs. They occur in all seas, from the turbulent, shallow tropical coastal waters - where the temperature can exceed 30°C - to the quiet depths of the arctic oceans - where the temperature drops below 0°C. Their size varies from about 3 to 300mm across, covering two orders of magnitude. The largest scallops live in the cold waters of the North Pacific and North Atlantic Oceans, along the coasts of the North American continent. There are about 350 scallop species known in the Recent marine fauna and several thousand fossil species have been found in geological strata, from the Triassic era onwards. Scallops played an important part in the affairs of man from the earliest times. First as food, then as jewelry, money and a source of artistic inspiration reaching its apogee during the renaissance and the baroque era, while in the modern age the scallop became the trade mark of one of the largest oil companies. Many scallops display brilliant colours, interesting patterns and attractive surface structures which make them popular with shell collectors.

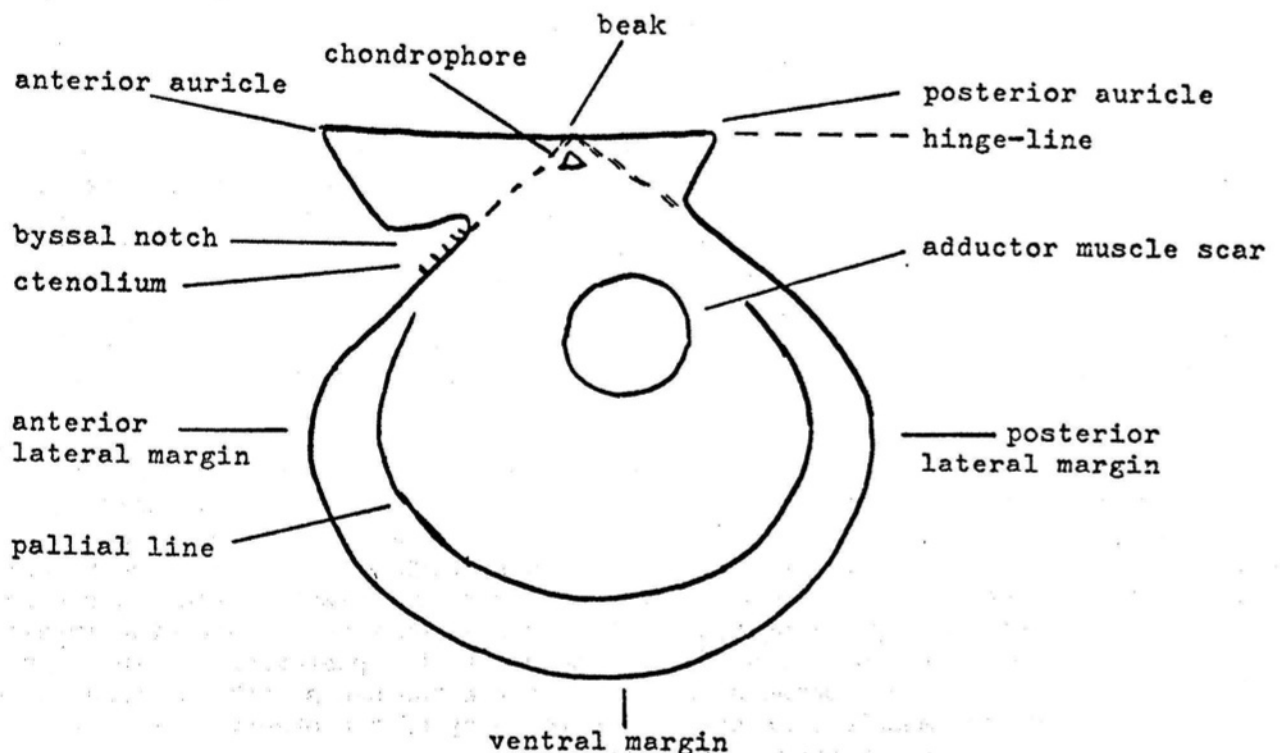


Fig.1 Interior view of the right (lower) valve of a scallop.

The success of the scallop owes a great deal to the plasticity of its anatomy and shell structure which enabled the animal to adapt to a wide range of environments. The shape of the scallop valve is approximately a semicircle, joined by an equilateral triangle along the diameter. The tip of the triangle (beak) represents the oldest part of the shell, the point where the growth started. The beak is flanked by two ear-like projections (auricles). The outer edges of the auricles form a straight line (hinge line) about which the valves turn when the shell is closed by the adductor muscle. The attachment of the adductor muscle to the valves is marked by a shallow, circular depression, known as the adductor muscle scar. Inside the valve, just below the beak, there is a triangular pit (chondrophore) filled with a tough, springy pad (resilium) which gets compressed when the adductor muscle closes the valves. When the adductor muscle relaxes, the resilium suddenly expands - much like a compressed piece of rubber would - and the valves burst open.

The two valves of the scallop shell are markedly different. The one is known as the lower valve, because of its position when the scallop rests on the sea bottom. It is always convex and often white or rather subdued in colour. By contrast, the other valve (known as the upper valve) can be convex, flat or even slightly concave and is often more darkly and brilliantly coloured. The lower valve is also called the right valve (RV) and the upper valve the left valve (LV). The terms right and left conjure up the picture of a scallop crawling along the sea bottom with its valves in the vertical plane, the hinge uppermost. However unlikely it seems, this does actually happen, but only in early life.

After the young scallop has hatched from the fertilized egg, it passes through a free-swimming veliger stage, during which it stays near the surface of the sea. At the end of the veliger stage it loses its swimming membrane and sinks to the bottom where it transforms into a miniature adult. At this stage it has a sizeable foot which can be extended, attached to the substrate and then contracted. By repeating this cycle the animal can move forward. Once it reached a suitable resting place, the function of the foot changes. Through a special gland, it secretes a bundle of silky threads (byssus) and uses this to attach the valves to the substrate. The byssus passes through an indentation in the anterior auricle of the lower valve, known as the byssal notch. The byssal notch is often bordered by a series of small denticles (ctenolium) which help to keep the byssal threads apart and prevent entanglement.

Most scallops break the byssal attachment as they grow older and become free swimmers. The break is not always final and many species are able to re-establish the byssal attachment when required. In marine aquaria e.g. scallops have been observed crawling up along the vertical glass wall by breaking the byssal attachment, re-establishing it at a higher point, pulling themselves up by the byssus and repeating the cycle, much the same way as a rock climber moves upwards by using his rope. Some scallop species retain the byssal attachment throughout life, while others cement themselves to the substrate permanently and thereby get considerably distorted as they grow.

When the scallop finally breaks free from the byssal attachment, the byssal notch serves no further purpose and in some species it gets gradually filled up. But in many species the byssal notch remains recognizable even in adult shells and provides a simple method for identifying the lower (right) valve where the byssal notch is always located. If the byssal notch is not recognizable, the lower right valve can be identified by making use of the observation that the adductor muscle scar is not in the centre of the valve, but nearer to the posterior margin. Hence if one holds the two valves between the palms of the two hands with the hinge uppermost and the adductor muscle scar nearest to the body of the observer, then the right valve is in the right hand of the observer.

The internal organs of the scallop are surrounded by a fleshy skirt, the mantle,

which secretes the outermost protective layer of the mollusc, the shell. The mantle consists of two symmetric flaps which are attached to the valves by the pallial muscles. The attachment is marked by a shallow, linear depression (pallial line) on the inside of the valves which runs close and parallel to the ventral margin. The edge of the mantle is lined with a large number of delicate, thread-like tentacles which act as sensory organs. Scattered somewhat unevenly among the tentacles, there is a row of brightly coloured, bead-like, light-sensitive organs, called ocelli. These are simple eyes, each fitted with a lens, a retina and an optic nerve which enable the scallop to detect movement and changes in light intensity. The ocelli give the scallop a nearly complete visual coverage of their environment over a field angle of about 340° . If within this range the shadow of an object falls on the ocelli, indicating the approach of a potential enemy, the valves close immediately.

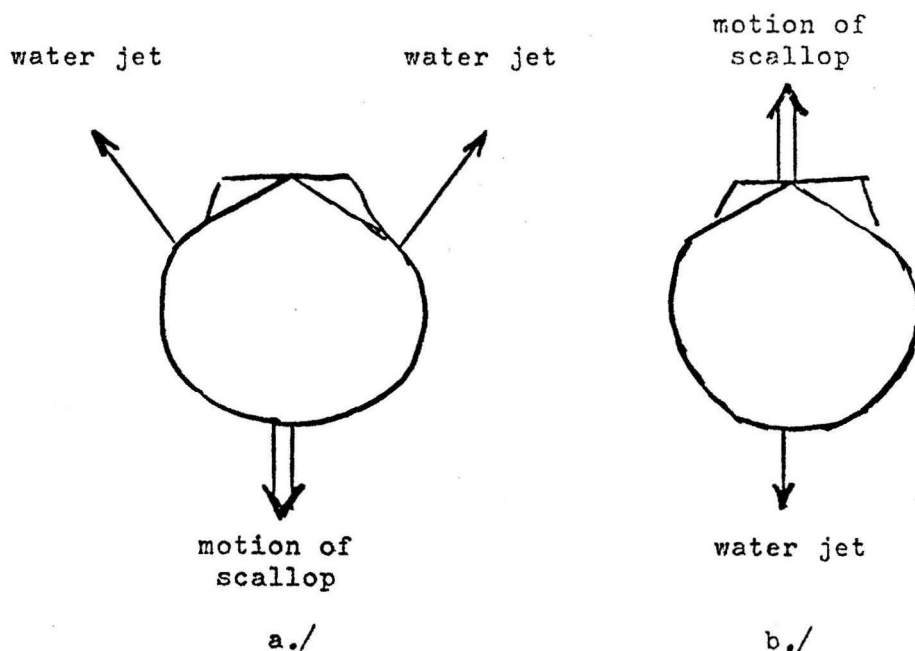


Fig.2 The jet-propelled swimming of the scallop.
a./ normal motion; b./ escape motion.

When the valves suddenly close, part of the water contained in the mantle cavity - the space between the mantle flaps not occupied by internal organs - is forced out of the shell. This surplus water is ejected in the form of a water jet passing through a nozzle which is formed by the muscular edge of the mantle. The ejection of the water jet causes the scallop to recoil in the opposite direction, just like a rocket. If the sudden closure of the valves was due to the sensory organs indicating the approach of a potential enemy from the ventral side, the water jet is ejected through the central part of the ventral margin, in a slightly downward direction. This allows the scallop to escape from its enemy by swimming upwards and away from it. During this jet-propelled escape motion the hinge-line is in front and the ventral margin is the back, with the two valves in approximately the same orientation as when the scallop rests on the sea bottom, LV always uppermost. The ample supply of high-quality sensory organs along the margins, covering a wide angular range, coupled with a fast-acting jet propulsion gives the scallop a good chance to escape from its predators and this provision plays an important part in the success story of the animal.

The direction in which the water jet is expelled - and hence the direction of the resulting swimming motion - can be controlled by the scallop through its muscles

in much the same way as we can control the direction of the airstream blown from our mouth by adjusting the lips appropriately. If there is no danger of an approaching enemy and the scallop shuts its valves simply to move away from its resting place, the excess water is expelled from the mantle cavity in the form of two jet streams, coming from the back of the lateral margins and passing close to the two auricles, at about right angle to one another, and pointing slightly downwards. As a result, the scallop will be propelled slightly upwards, with the ventral margin in front, the hinge line in the back and the two valves in a similar orientation as at rest. To facilitate this normal swimming motion, the lateral margins of some scallop species do not close tightly, but there is a slight gap between them, through which the two water jets are ejected during swimming.

The jet-propelled swimming motion of the scallop is quite fast, speeds as high as 73 m/sec have been observed, which is about half the human speed record for 100 m swimming, hardly a "snail's pace". But the ejection of a single water jet carries the scallop only a few meters away. Then the process can be repeated, the scallop can open its valves, take in more water and expel it by a sudden closure of the valves, thereby producing a second water jet which carries the animal a few meters further, usually in a different direction, and so on. Hence the swimming of the scallop is not a uniform, continuous movement along a straight line, but a succession of short jerks, each in a different direction, resulting in a zig-zag motion. This has a distinct advantage for the animal, since such an irregular path is difficult for a predator to follow.

The swimming ability of the scallops varies greatly, depending both on the species and the age of the individual. Young scallops are usually better swimmers than old ones which tend to become heavy and turn to sedentary life. This is particularly true for scallops with a flat or slightly concave left (upper) valve which provides a convenient anchorage for a wide range of sedentary marine organisms, animals and plants alike. The sheer weight of these lodgers is often enough to prevent the scallop from leaving its nest late in life.

The requirement to be a good swimmer puts certain constraints on the shell of the scallop. The valves have to be approximately equilateral, otherwise it would be difficult for the animal to keep the valves in nearly the same horizontal orientation that they take up at rest. Strongly inequilateral valves would easily tilt over sideways. The valves also have to be light, otherwise it would be too much effort for the animal to move them. These requirements are best met by scallops living in quiet, deep-water habitats, many of which are known to be excellent swimmers. The shells of these scallops are thin, light and the valves have a distinctly streamlined appearance. They are smooth on the outside, slightly elongated in the direction of motion, their auricles are small and triangular in shape, slanting towards the beak.

The requirement of keeping the weight of the shell low to facilitate swimming has to be reconciled with the requirement of sufficient mechanical strength which calls for thicker, heavier shell, able to withstand the buffeting of the waves and provide protection from the attack of predators. For scallops living in quiet, deep-water habitats with few predators, the requirement of mechanical strength can be satisfactorily met by the formation of a few radial ribs on the internal surfaces of the valves. These ribs increase the mechanical strength of the rather thin valve sufficiently without adding too much to its weight. Such internal ribs do not increase the valve's resistance to motion, hence they do not interfere with swimming.

For scallops living in the more turbulent coastal waters, teaming with predators, such internal ribs do not provide sufficient protection. Here the strengthening ribs protruding from the smooth valve surface are replaced by folds (plicae) involving the entire thickness of the valves. The result is a kind of corrugated

valve surface, similar to the one used by builders for roofing, to obtain maximum mechanical strength with the minimum weight. True, such folded surface - often complemented by erect scales, knobs and other structures for added strength and protection - increase the valve's resistance to motion and thus hinder fast swimming. But this is a small price to pay for the added strength and protection obtained and scallops with such folded valves are much better fitted to the life in coastal waters.

Though the auricles do not add to the strength of the valve and increase its resistance to motion, they are, nevertheless, an essential feature of the scallop valve. Their main function is to extend the hinge-line well beyond the narrow beak region and thereby provide a more stable axis about which the valves can be turned when the shell opens or closes. The long hinge-line also prevents rotation of the valves in their own plane which would lead to misalignment so that the shell could not be closed properly. This is particularly important for shells with folded surfaces where the two valves must be exactly in register when closing, so that the elevations of the one valve fit exactly into the corresponding depression of the other valve along the margin.

The reason why the right (lower) valve of the scallop is always convex can be best understood by considering the feeding habit of the animal. Scallops are suspension feeders, feeding on microscopic marine organisms which they filter out of the seawater. When the animal rests on the substrate breathing and feeding, the valves are kept slightly open, the width of the gap depending on the size of the shell. In an adult Chlamys opercularis e.g. the gap is about 4 mm wide. Through this gap the scallop draws a steady current of water into the mantle cavity, bringing oxygen and food. This current is maintained by a rhythmic beating of the hair-like processes (cilia) covering the gills which are located just inside the edge of the mantle. The convexity of the right (lower) valve ensures that the opening of the shell is kept clear of the surface of the substrate, so that the water current entering the mantle cavity is free of sediment. Scallops living on soft substrates need right valves of much greater convexity to achieve this end.

As the scallop grows, new shell material is constantly added to its margin by the mantle in approximately concentric circles. The rate of growth depends on several factors, such as the availability of food, the age of the animal and also seasonal variations. Until the scallop reaches sexual maturity the growth is fairly continuous, thereafter it slows down considerably during spawning. For Chlamys opercularis - and several other scallops living in northern temperate waters - this is roughly the April to June period. This stagnation and subsequent restarting of growth often gives rise to the appearance of concentric rings differing in colour from the rest of the valve surface. Since the appearance of such rings is of yearly occurrence, by counting these rings one can tell how many years have passed since the scallop reached sexual maturity. As the animal gets older, the growth slows down and the year rings get closer to one another. In Chlamys opercularis e.g. the gap between successive rings is reduced to less than 1 mm after ten years.

E. Sándor, 14.2.1985

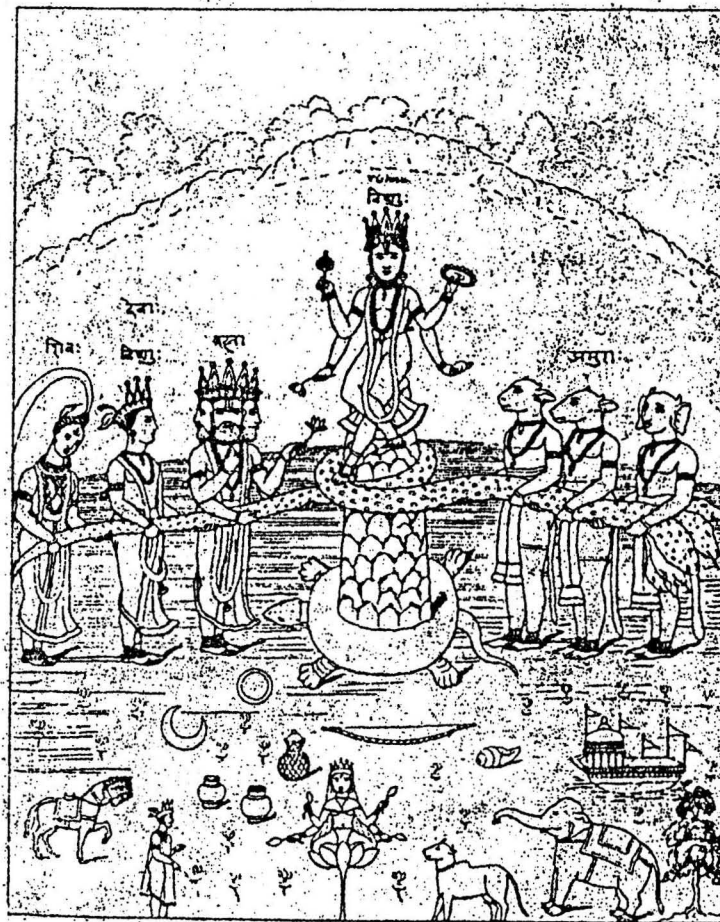
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LAKSHMI'S BASKET

The churning of the milky ocean is one of the popular stories of Indian mythology: The gods felt weak and slipping and anxiously began to look for a restorer of their former energy. The surest cure was a sip of amrita, or ambrosia, the drink of immortality, but nobody knew where to find it. At last Vishnu advised to "collect all plants and herbs of divers kinds from every quarter, cast them into the sea of milk, take Mandara, the mountain, for a churning stick, and Vasuki, the serpent, for a rope; together churn the ocean to produce the beverage.." The gods did as had been suggested and the great churning brought to the ocean's surface a number of surprises such as the wishing cow, the tree of Paradise, the moon and other desirable objects:



CHURNING OF THE MILK OCEAN
(From Moor's Hindu Pantheon)

And then "... seated on a lotus Beauty's bright goddess, peerless Sri, arose out of the waves, and with her, robed in white, came forth Dhanvantari, the gods'

physician, high in his hand he bore the cup of nectar.."



LAKSHMI

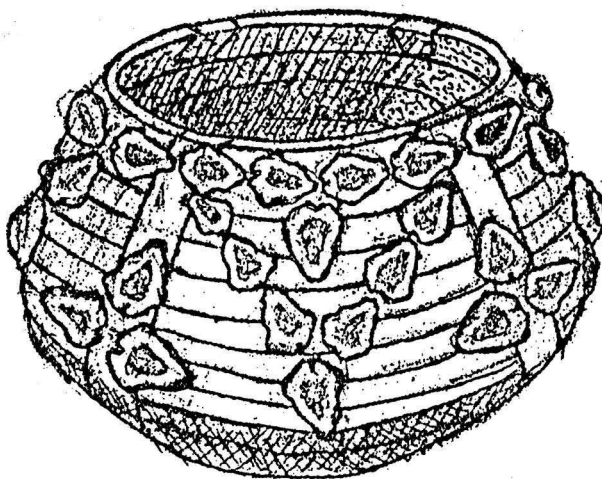
On Sri's appearance the heavenly elephants took up their pure waters in golden vessels and poured them upon her. The sea of milk presented her with a wreath of unfading flowers, and the artist of the gods decorated her with lovely ornaments. "Sri" is a synonym for "LAKSHMI", consort of Vishnu, goddess of beauty, wealth and prosperity. She is also known as PADMA ("the one who dwells on a lotus"), as JALADHIYA ("the ocean-born"), as LOKAMATA ("mother of the world"), and even as CHANCHALA ("the fickle one"). The Greeks worshipped her as APHRODITE and the Romans as JUNO. Lakshmi's origin from the sea explains the emblematic presence of shells with which she is always depicted, including the sacred chank. It is during the daily worship in front of the house-altar that the chank is blown by a devoted Hindu housewife.

The shells lying at Lakshmi's feet vary with the exception of the chank and the cowrie, though the latter may be tigris or moneta. It is the money cowrie which in this case is of particular importance as it was this shell which was used as money for thousands of years throughout India up to the middle of this century. In Bengal the cowrie did not only mean "small change", but it symbolised "money" and "wealth" in general. Knowing this we are enabled to understand the significance of Lakshmi's basket.

In all illustrations Lakshmi is holding a kind of cornucopia from which she may be pouring grains of rice - symbol of prosperity and wealth. She is also surrounded by a number of objects: There are the above-mentioned seashells and a longish container called a KUM-KUM. This holds a red powder used for making the spot between the eyes for good luck. Next to it stands the LOKHIR-JHAPI, a basket-like object and the subject of this article. The owl, poor thing, is considered in India to be a stupid bird. When it was looking for someone to stay with, nobody wanted to have anything to do with it. At last, Lakshmi in her kindness and compassion gave it shelter.



LOKHIR is the Bengali version of LAKSHMIR and JHAPI means "container", hence LAKSHMI'S CONTAINER. The cheaper kind of jhapi is either woven or plaited like a basket. The more substantial variety as shown in the illustration consists of strips of cane glued on top of each other like a coiled clay pot. The flimsier type is then covered in red cloth whereas the outside of the glued jhapi is painted red. Jhapis may or may not have a pointed lid, but all are finally decorated with patterns made of cowries (C. moneta) and other materials to add beauty to the whole.



JHAPI (३) - 14 cm. wide, 8 cm. high

In Bengal the jhapi is one of several articles traditionally given to a bride on her wedding day. She will put seven kinds of grain into it together with other auspicious objects such as sacred beads and a few cowries as well as all or part of her jewellery.

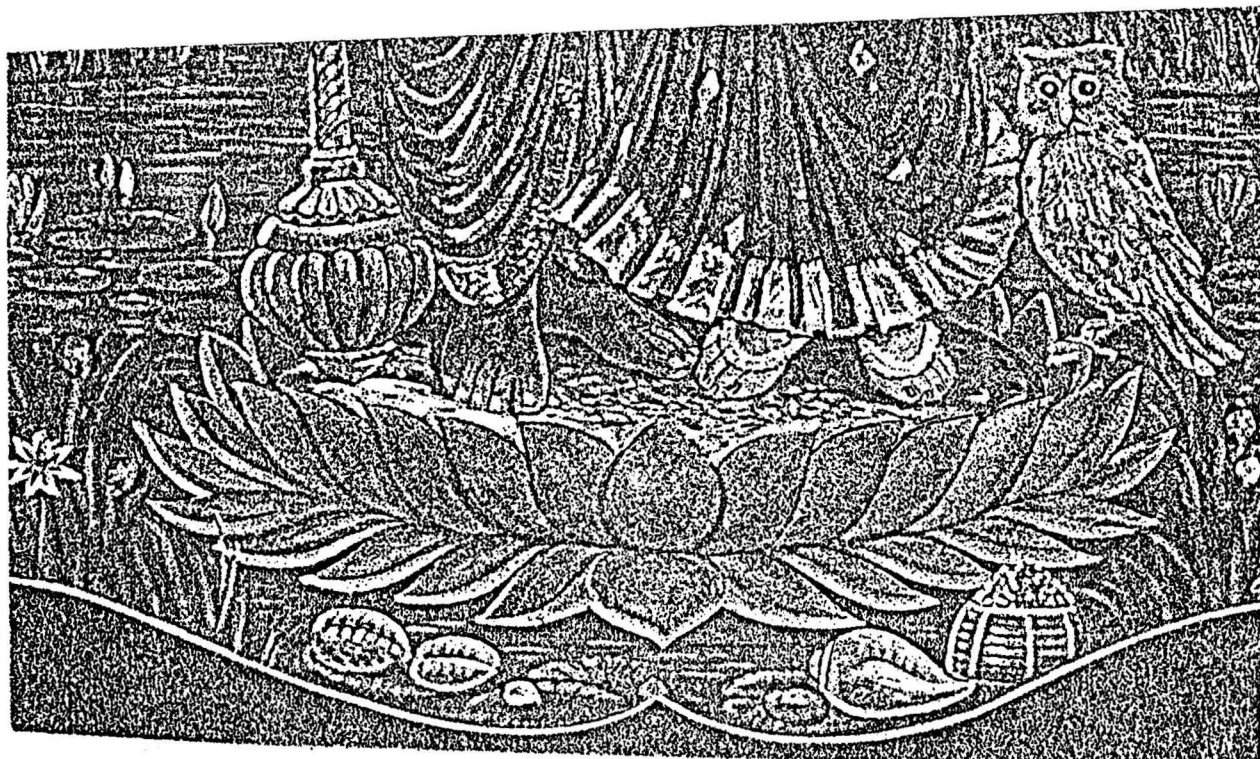
Thursday is a sacred day to Lakshmi. Devotees of the goddess are advised to draw no or little money from their accounts, and bank business is noticeably slack

on that day because of Lakshmi puja (=worship). In the evening "the virtuous housewives shall paint the place in the house with rice paste paint (a beautiful pattern called an Alpana) on the floor where the worship of the deity will take place". On it will be placed before an image of the goddess the "offering plate" on which among other objects of the ritual will be the jhapi. "At the time of worship there must be five women whose husbands are living". The exact procedure of the puja is described in "LAKSHMI PANCHALI", a little devotional book containing also prayers and allegorical stories. It is obtainable in every vernacular bookshop indicating the popularity of Lakshmi.

Divali, the Hindu New Year's Day, is a particularly auspicious time for Lakshmi puja. On this day Hindu merchants renew their account books, whitewash their offices, and generally "begin a new life". When a man is growing rich it is said that Lakshmi has come to dwell with him, whilst those in adversity are spoken of as "forsaken of Lakshmi". Here is a list of benefits that accrue from worshipping the goddess:

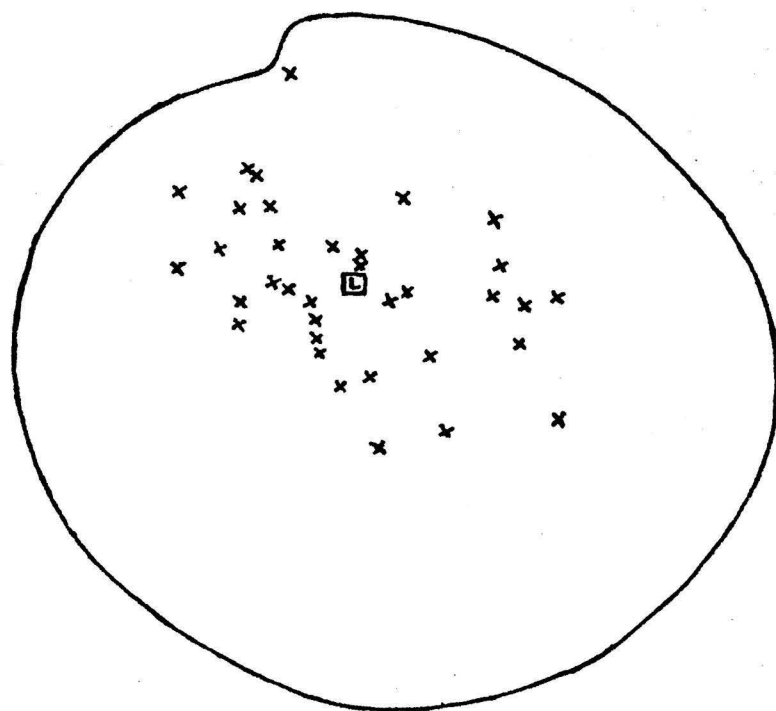
"From Thy propitious gaze men abotain wives, children, dwellings, friends, harvests and wealth. Health, strength, power, victory, happiness are easy of attainment to those upon whom Thou smilest. Thou art the mother of all beings..."

Fred Pinn

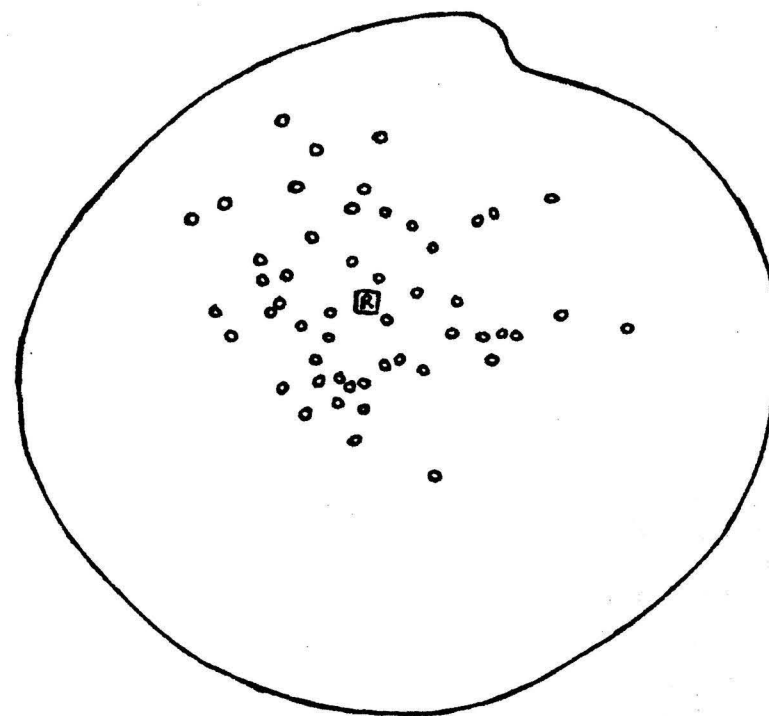


PREDATORY GASTROPOD BORINGS ON THE BIVALVE LORIPES LACTEUS AT MOLUNAT, YUGOSLAVIA

In a recent contribution (Morton 1984) the shell content of Recent shallow marine sand at Molunat in Yugoslavia was analysed. The most common species was found to be the lucinacean bivalve Loripes lacteus (Linn.) which made up 41.7% of



LEFT VALVE.



RIGHT VALVE

FIG 1. Positions of holes drilled in Loripes lacteus

the specimens recovered. Details of the locality were given earlier, along with discussion of some aspects of ecology. It was noted that 10.8% of the bivalves and 4.6% of the gastropods had been drilled by predatory gastropods. The purpose of this contribution is to show how variable are the positions of the holes drilled in the valves of the most common species.

The numbers of specimens of Loripes lacteus found, and the numbers and percentages of each category drilled are:

	number	drilled	percentage
conjoined valves	21	0	0
left valves	265	35	13.2
right valves	300	52	17.3
TOTALS	586	87	14.8

The percentages of valves drilled are higher for Loripes lacteus than for bivalves as a whole. This presumably reflects their shallow burrowing habit and relatively thin shells. There is no obvious explanation for the percentage difference between left and right valves.

The positions of the holes drilled were measured and standardised for shells of different size as two coordinates:

- (a) distance from umbo to hole divided by height of valve
- (b) distance from anterior edge to hole divided by length of valve.

The positions of the holes are variable on both left valves and right valves as shown in Fig. 1, which represents the standardised positions on left and right valves of approximately the "average" shape. Values for means standard deviations, and coefficients of correlation with size, for left and right valves are:

		LEFT	RIGHT
Standardised distance from umbo to hole (a)	mean	0.396	0.415
	stand. dev.	0.118	0.118
	corr. coef. w. ht.	-0.398	-0.029
Standardised distance from anterior edge to hole (b)	mean	0.443	0.555
	stand. dev.	0.143	0.127
	corr. coef. w. lth.	-0.204	-0.056
Number of specimens		35	52

The mean positions for the holes are marginally lower and more posterior on the right valves compared with the left valves, but the differences are too slight (less than the standard deviation) to be significant. Similarly low negative correlation coefficients with size, especially for right valves, suggest that there is very little tendency for the positions of the holes to be influenced by the size of the shells.

Reference: Morton, N. 1984. Shell content of Recent shallow marine sand at Molunat, Yugoslavia. Conch. Newsletter, 90, p.202.

Nicol Morton, Department of Geology, Birkbeck College, University of London, 7-15 Gresse Street, London, W1P 1PA

LIFE HISTORIES OF BIVALVE MOLLUSC LARVAE

Artificial rearing experiments in the Tasmanian Fisheries Research Laboratory at Tarooma, near Hobart, in a project funded by the Commonwealth Government's Fishing Industry Research Trust Account have provided valuable information about the life history of bivalve molluscs.

Few molluscs swim as adults, common exceptions being the specialised cephalopod squid and cuttlefish. Bivalve molluscs include species such as oysters, scallops, mussels and clams. As adults all live in close association with the seabed or attached to artificial structures such as buoys and jetties.

However most bivalves pass through a young or larval stage and during this phase they swim, albeit slowly, largely at the mercy of tides and currents.

The period of time that these minute bivalve larvae swim varies from a few hours to weeks or even months. (Some larvae do not undergo a swimming planktonic phase - they are brooded in the parent and are liberated in a miniature adult form.)

Artificial rearing experiments provide valuable information

Variations in the pattern of development of young bivalves were noted in three bivalve species that were raised artificially in the Fisheries Research Laboratory at Tarooma (Dix, 1976, Dix and Sjardin 1975 and Australian Fisheries August 1975, March 1976).

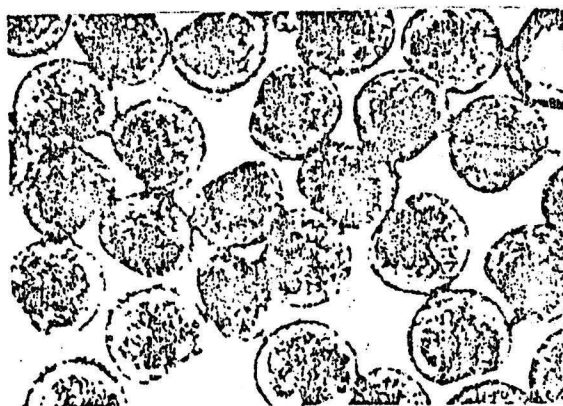
Most bivalves are similar to the Pacific oyster (Crassostrea gigas), Sydney rock oyster (C. commercialis), commercial scallop (Pecten meridionalis), or mussel (Mytilus edulis). These species have small eggs (less than 100 microns, about 40 thousandths of an inch), which are spawned by adults in tens of millions into the surrounding sea water where they are fertilised by sperm.

The fertilised eggs divide repeatedly and in a few hours form the first larval stage called a trochophore. This stage, unlike older larvae and adult bivalves, does not have a shell. It is not much bigger than the spawned egg but is covered by minute hairs or cilia which move and enable the trochophore to swim.

The trochophore develops after two or three days into the next larval stage - the veliger. Significant features of the veliger are that it develops a mouth and digestive tract and so begins feeding; it also develops a pair of fragile shells that can enclose the body. Furthermore it possesses a specialised organ called a velum. This lump on the larva has long, rapidly-beating cilia. Their rhythmic beating propels the larvae through the water; they also cause minute planktonic food to be wafted into the mouth and moved through the digestive tract.

Most young veligers look alike and apart from size differences, few experts could distinguish young veligers of species as different as scallops and oysters.

The young veligers, which are sensitive to light and often swim upwards to near the sea surface, feed and grow steadily for days or weeks. During this growing phase, the shells of different species assume characteristic shapes or colours that enable identification. A



Larval stages of the queen scallop
1. 3 day old veliger larvae about 150 microns long;

further aid to identification is the minute joints that hinge the two shells in place. These joining teeth function much like an elbow joint.

The veliger's swimming life is limited and a stage is reached when the larva develops a new organ - the foot. Initially the larva (which may still be less than 200 microns long) has both a foot and a velum. This larva, the pediveliger stage, ceases active swimming and sinks to contact a suitable place to settle.

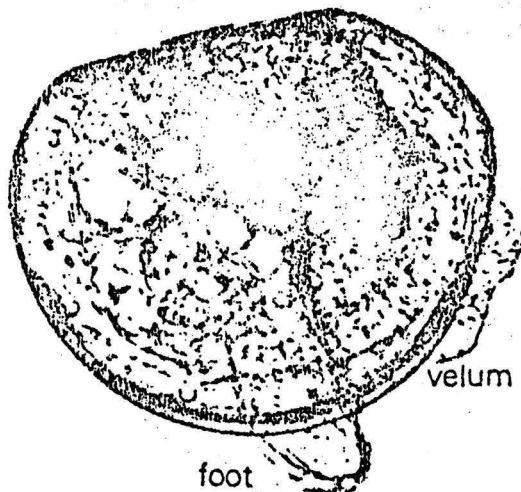
It crawls over likely settlement surfaces such as rock or weed seeking out a place to live. If such a spot is not found, the larva swims off to try elsewhere. Having found a spot (which may take days or even weeks) the larva finally ceases swimming. It then undergoes a major change or metamorphosis, the velum is resorbed, often the foot is resorbed or modified, and the larval shells grow to form a shell similar to that of the adult.

The larva has become a spat or juvenile which may cement to the bottom, as in the case of oysters, or become attached by threads as seen in mussels. Young scallops are attached also by these threads, although the commercial scallop soon loses them and lives freely on the bottom. At the metamorphosis stage, the young bivalves are usually too small to be seen by the naked eye although they grow steadily.

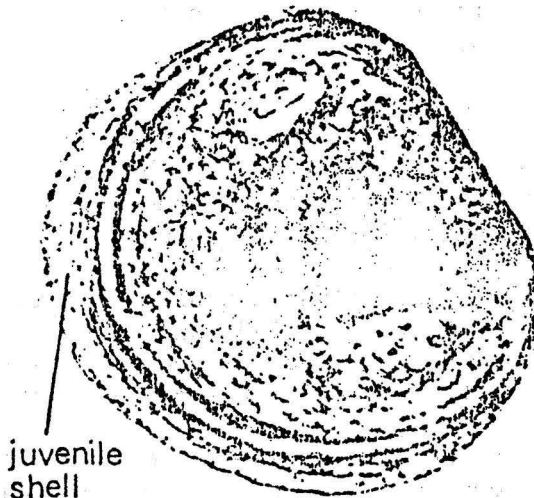
The queen scallop (Equichlamys bifrons), which has been raised at the Fisheries Research Laboratory, has a similar life history to that described above although the egg is larger (Dix 1976a). This means that the young veliger is larger than that of the commercial scallop and also that the period from egg to settlement is shorter (less than 3 weeks).

A further shortcut is seen in the native oyster (Ostrea angasi) (Dix 1976b). In this species, unlike the rock oysters, the adult female oyster does not spawn eggs directly into the sea. The eggs are retained inside the female's mantle cavity where they are fertilised by sperm drawn in from surrounding water. They undergo development inside the parent to a fairly advanced veliger stage. If you open an oyster at this stage thousands of dark specks like fine sand grains may be seen; these are the larvae. European oystermen call such oysters black sick. The larvae may also be seen inside the oyster when younger but they are of a lighter colour (hence white sick).

The female oyster releases the well-advanced larvae by puffing them into the water where their swimming period is relatively short (about two weeks or less).



2. Pediveliger larva showing foot and velum;



3. Newly settled and metamorphosed scallop beginning to develop juvenile shell. About 210 microns long.

The New Zealand Stewart Island or Bluff oyster was once considered the same as the Australian native oyster. However larvae of the New Zealand oyster are brooded by the parent until an advanced stage. They may swim or crawl for a few hours or days only before settling and attaching to the seabed.

Significance of different patterns

The varying patterns of larval development have ecological significance; the proportion of species with shortened larval life varies at different depths and in different latitudes (Ockelmann 1965).

A few examples will show how features of larval development also have significance in shellfish culture, either in hatcheries or in nature. Oysters for example which cement onto a settlement surface may be collected and grown on the same substrate, such as sticks or shell. Commercial scallops, which attach for a short period only as spat or young, must be collected by a method which does not allow their escape after settlement. Japanese culture techniques, under trial in Tasmania, capture the larval settling scallops in a fine mesh net bag (Taguchi 1976). By the time the scallops detach from the settlement surface they are too large to drop through the net. These nets, and also settlement materials for oysters, can become fouled rapidly in the sea and it is important to know the time at which larvae are likely to settle. If the larvae can be identified in collections sieved from the plankton their sizes and numbers can be recorded. Knowing the size at which different species settle, one can predict a time of spat settlement. Such a spat prediction program has been conducted for Pacific oysters in the Tamar River, Tasmania for a number of years by marine biologist Colin Sumner. Similar prediction work is an essential part of the Japanese scallop culture industry and would be possible in Tasmania now that the two common species can be identified from artificially reared specimens.

Larvae of the bivalves have particular requirements of their surroundings in order to grow and survive. The Tamar River work shows that salinity and temperature are two key factors influencing the large number of young larvae which survive to the spat stage. Depending on summer conditions in the Tamar, the intensity of spat settlement changes from year to year. This has proved a major constraint to expanding production in Tasmania's potentially-significant oyster industry and investigations funded from the Fishing Industry Research Trust Account have sought to produce Pacific oyster larvae in quantity in a hatchery at the Fisheries Research Laboratory, Tarroona.

Young larvae are reared on specific foods found suitable in overseas hatcheries. Unfortunately survival has been poor in the laboratory and worthwhile quantities of spat have not been produced. Whether hatchery spat production, as is carried out commercially in USA and UK, is an economic proposition to achieve production continuity for Pacific oysters in Tasmania must await further evaluation.

Using similar hatchery techniques, larvae of the native oyster were raised to a grow-out stage at Tarroona in 1975. The larvae which settled on scallop shells were grown by suspended culture on a raft at Margate in southern Tasmania. They were harvested recently at marketable size after two years' growth in the sea.

By Trevor Dix, a senior biologist at the Tasmanian Fisheries Research Laboratory at Tarroona, near Hobart. [from 'Australian Fisheries', August 1977, submitted by Betty M. Smith]

THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

The 981st. (Ordinary) Meeting held on 16th. February 1985 at B.M.(N.H.)

In the Chair: Mr. A. Norris with 30 members and friends present.

Nominations and Elections: 3 full members and 1 junior member

Full members:

Elwes, Mrs. G., [REDACTED], Astley, Stourport-on-Severn, Worcestershire,

Skerrett, Mrs. M.S., [REDACTED], Trentham, Stoke-on-Trent, Staffordshire.

Smith, Mrs. P.M., [REDACTED], Trentham, Stoke-on-Trent, Staffordshire.

Junior member:

Hough, Rupert, [REDACTED], Harrogate, N. Yorks., [REDACTED]

Lecture: 'Molluscs of a small river from source to estuary' by Dr. Chatfield.

Announcements and Correspondence: Dr. Gascoigne announced that sales of the booklet about fine dissection of Ascoglossans were doing very well.

Mr. Norris announced that at the forthcoming meeting in Leeds on March 9th. the talk would be by Mr. Norris on Ibiza, not Dr. Colville talking about Marjorcan snails. The field meeting organised for 6th. and 7th. July would now be in Doncaster, not Huddersfield Canal. The Conchological Society lecture to be held on 18th. May will be about Non-Marine Mollusca of cold water - not Marine Mollusca. Mr. Norris urged all members of the Society to either sign and return the petition forms on the voting papers, or to sign the petitions in bookshops in order to make known opposition to the imposition of VAT on books and publications.

The meeting closed at 4.52 p.m.

Exhibits

- | | |
|--------------|--|
| R. Isaacs | 2 specimens of <u>Murexiella martini</u> Shikama 1978
with Plate 19 of 'Red Sea Shells' (Sharabati)
and letter from Roland Hovart. |
| T. Pain | Mollusca of a Guyanese River |
| M. Mitchell | Genus <u>Siphonaria</u> Sowerby 1825 |
| T. Gascoigne | 'Biology of Opisthobranchs' Vol. 2, and Recent Papers |
| J. Chatfield | Some books and figures on molluscs of streams |
| S. M. Davies | Some slugs changing colour (including adult <u>Limax maculatus</u> with eggs
and young - from I.O.M.) |

The 982nd. (Annual General) Meeting held on 16th. March 1985 at B.M.(N.H.)

In the Chair: Mr. A. Norris with 45 members and friends present.

Appointment of Scrutineers: Mrs. Pain and Mr. Worth agreed to serve as scrutineers again this year, and were so appointed.

Nominations and Elections: 4 full members

Bell, N.B., [REDACTED], St. Andrews, Bristol.

Galganski, A., [REDACTED], 85-047 Bydgoszcz, Poland.

Kadolsky, D., [REDACTED], Sutton, Surrey, [REDACTED]

Marquet, Dr. R., [REDACTED], 2008 Antwerpen, Belgium.

Report of the Council 1984/85: read by the Hon. Secretary and accepted.

Report of the Accounts 1984/85: Copies of the Accounts were circulated and the

report was read by Mrs. Rands on behalf of Mrs. Fogan who was ill; both were accepted.

Report of the Non-Marine Recorder: read by Dr. Coles on behalf of Dr. Kerney and accepted.

Report of the Marine Recorder: read and accepted.

Report of the Hon. Junior Members Officer: read and accepted.

Report of the Hon. Field Meetings Officer: read and accepted.

Announcements: the President pointed out that the number of members had dropped over the last year, due to a lower number of new members. He requested that all members should bear this in mind and try to recruit new members.

The President also pointed out that the number of exhibits at meetings had dropped recently. He asked members to try to bring something along to exhibit at meetings, since this was one of the principle reasons for the Society.

Results of the Postal Ballot: It was announced that the following members had been elected to serve on Council: Dr. Colville, Dr. Holyoak, Mr. Willing and Dr. Sándor.

Election of Auditors: Dr. Lloyd Evans and Mr. Edwards have agreed to continue as auditors and this was confirmed by the Meeting.

Presidential Address: 'Collectors'.

Announcements and Correspondence: Mr. Negus proposed a vote of thanks to the 'tea girls'. He also drew the attention of the meeting to a leaflet concerning a new book on Nudibranchs based on the paintings of Dr. Lemche, available to members of the Society at a discount. Details can be obtained from the secretary. The retiring president Mr. Norris handed over officially to the incoming president Mrs. E. B. Rands. There being no other business, the meeting closed at 5.20 p.m.

Members Exhibits

J. Light	Shells from the Fleet Estuary and Portland Harbour.
E. Sándor	Family Muricidae Rafinesque, 1815, Subfamily Ocenebrinae Cossmann, 1903.
R. P. Scase	<u>Lynia (Harpulina) anna</u> Lesson - a rare Indonesian volute.
S. Harrison	Specimens of <u>Thais</u> from Fuerteventura (Canary Is.) and the Gambia.
J. Llewellyn-Jones	Volutidae.
T. Pain	The genus <u>Revoilia</u> Bourguignat, 1881 Subgenus <u>Socotora</u> Pallary 1925 (Prosobranchia - Pomatiidae).
D. R. Worth	South African Shells.
E. O. Bishop	'Puzzle Corner'.
R. Isaacs	<u>Lyria archeri</u> Angas 1865, two specimens, papers by Delplangue <u>et</u> <u>al.</u>
A. Norris	Collections.
P. E. Negus	Some lower Lias ammonites and nautili.
R. C. Preece	<u>Helix rya</u> (only the second known specimen) Red Crag, Waldringfield, borrowed from Ipswich Museum.
M. B. Seddon	The European land-snail genus <u>Chilostoma</u> .
E. B. Rands	Results of an Irish expedition by Mrs. M. Fogan, Mrs. E.B. Rands and Dr. A. Rundle.
D. T. Holyoak	Pomatias.
W. Karo	Volutes, cowries, cones, <u>Strombus</u> and <u>Lambis</u> - seven photographs taken by the B.B.C.

The 983rd. (Ordinary) Meeting held on 20th. April 1985 at B.M.(N.H.)

In the Chair: Mrs. E. B. Rands with 35 members and friends present.

Nominations and Elections: 2 full members

Comer, Miss C., 60 Gorwell Road, Barnstaple, Devon, EX32 7HS

McGonagle, Miss L.C., Puddington Hall, Puddington, South Wirral, Cheshire.

Lecture: 'Priorities and problems in mollusc conservation' by Miss Susan Wells.

Announcement: Mrs. Fogan announced that she would be pleased to receive any 1985 subscriptions as soon as possible.

Announcements and Correspondence: Mr. Negus announced that the company Hampshire Micro had moved to new premises.

Mr. Pain announced on behalf of Mr. Osborn that the British Shell Collectors Club Annual Convention would be held on Saturday 27th. April in Northampton in the Humphrey Rooms between 10.30 and 6 p.m.

The meeting closed at 5.23 p.m.

Exhibits

- | | |
|----------------|--|
| A. Moncur | Unknown collection purchased from antique dealer in Farnham, Surrey. |
| W. Karo | <u>Entemkotchus rumphii</u> Schepman 1879. Okinawa, Japan. |
| S. Harrison | <u>Cymbiola (Aulicina) nivosa</u> . |
| F. R. Woodward | <u>Voluta pacifica</u> from Cook's first voyage 1768-1771 and original engravings. |
| S. P. Dance | The handbook of Conchology. ? is this the smallest shell book known. |
| R. Isaacs | <u>Volutidae: Cymbium souliei</u> Marche Marchad 1974, 2 shells; 2 gravid females with young emerging from foot. |
| P. Palmer | Structure of the phragmacone of <u>Sepia officinalis</u> ; and shell repair in <u>Sepia officinalis</u> . |
| A. Wakefield | A few examples of some of the nicer and rarer cone shells in my collection. |
| F. Pinn | Lokhir Jhapi (Lakshmi's Basket). |
| M. B. Seddon | Endemic land snails from Madeira and Porto Santo. |
| D. T. Holyoak | Some endemic land snails from N.W. Africa. |
| I. Killeen | Distribution map of non-marine mollusca in Suffolk. |
| D. Guntrip | Northamptonshire Field Trip - some interesting finds - <u>Columella aspera</u> and <u>edentula</u> ; <u>Aplexa hypnorum</u> ; <u>Pyramidula rupestris</u> ; <u>Testacella scutulum</u> . |
| B. Colville | Narrow endemics; <u>Albinaria</u> from Crete. |
| T. Pain | Narrow endemics. |
| S. Wells | Mollusc conservation - publications, Red Data books and some threatened species. |
| M. Mitchell | Polyplacophora. |
| E. Sándor | Family Muricidae Rafinesque, 1815; subfamily Muricinae Rafinesque 1815 and subfamily Trophoninae Cossman, 1903.
Family Columbariidae Tomlin, 1928. |

NOTES ON HISTORICAL CONCHOLOGY 3

S. P. Woodward's 'A Manual of the Mollusca'

S. P. Woodward (1821-1865) was at various times secretary of the Geological Society, first Professor of Geology and Natural History at the Royal Agricultural College,

Cirencester and Assistant in the Geology Department of the British Museum. He is principally known amongst conchologists for his book A Manual of the Mollusca: or a Rudimentary Treatise on Recent and Fossil Shells. Originally published by Weales in three parts (1851-1856), it appeared in three other English editions (the last two with additions by Ralph Tate) and a French translation by A. Humbert which formed the basis for P. H. Fischer's Manuel de Conchyliologie. Woodward's own copy of the first full edition of his Manual is now at Norwich Castle Museum and is profusely annotated. Most of these annotations are either notes amplifying the text or corrections to it but most of these do not appear to have been incorporated into the later editions. There are also a number of interesting comments of a more conchological nature, some of which, with explanatory notes, are reproduced here.

"At Holford's Sale C.[ypreae] princeps = £40"

James Holford's collection of shells, insects and general natural history was auctioned in 1854, after his death. A specimen of this species was sold for the same price eleven years later in 1865 at the Dennison sale, when it was noted that only three others were known.

"Long Island was called Seawanhackee (?) by the Mohegan Indians (Shell I[slan]d) who resorted to it to collect seawan-wampum shell [Mercenaria mercenaria] - from which they made purple beads."

Wampum were small cylindrical beads made from the ends of shells rubbed down and polished. If loose they were seawan wampum, if threaded, peag wampum. They were used by the North American Indians as currency or ornament, and as a substitute for writing for mnemonic and symbolic purposes.

"In the British Museum is preserved a limpet shell which had lived so long upon another individual as to have worn a hollow in its shell. By what arrangement did the first limpet know where he should find his friend when he wished to look? Did he go in search of him or wait at the old spot for his return?"

"M. Verrede in May 1854 collected specimens of Desert snail in camel thorn Egypt - brought them home - gave 2 to Mr. Wright in Aug/58 which revived after wetting." Several similar instances of the revival of Helicids after prolonged storage had at that time been reported by a friend of Woodward's, J. S. Gaskoin (1791-1858) (Proceedings of the Zoological Society 1850, 18: 243-4.)

"The only specimen of Mulleria [Etheria] in England was purchased many years ago by Mr. Thos. Norris [d? 1873] of Bury for £20." This portion of the text is accompanied by a note that "the specimens sent by Mr. D'Orbigny to the British Museum [illustrated by Woodward p.469] were in exchange for a crinoid Pentacrinus briareus [?] which cost 15/-".

Norris's specimen was examined by Lovell Reeve in order to decide if the genus really differed from Etheria Lamarck. Reeve was, however, so struck by its appearance that he decided to include it in his Conchologia Iconica which had only just commenced publication (Reeve L.A. and Catlow A. 1854. The Conchologist's Nomenclator p.69). It was eventually included by G. B. Sowerby in 1872 (Volume 18) after Reeve's death.

"The beach at Weymouth (Dec'14/57) was strewn with cuttle bones, I might have gathered 1,000 in the space of a mile. The animal is rarely found here. Rather moderate, light Southerly wind. R. Damon." Robert Damon (1814-1889), the dealer, lived in Weymouth.

"Orange Cowry [Cypraea aurantium] in British Museum bought by Mr. Mawe [the dealer 1764-1829] at £30 for Mr. Broderip."

W. J. Broderip (1789-1859) had already owned at least one specimen of this species which he had purchased for £20.10s in 1821 at the sale of the Angus collection. The following year at the Bligh sale a specimen was sold for £9.19.6d. Some fifty years

later in 1873, at the sale of Thomas Norris's collection, the price had plummeted to only 17/-.

"Cypraea guttata £25 Stevens sales. May 31/65. Miss Saul."

No sale is recorded by Chalmers-Hunt (Natural History Auctions 1700-1972. Sotherby Parke Bernet, 1976.) so it is not known whose collection the specimen originally belonged to. As for C. guttata, in 1876 there was only one specimen in Britain and some fifty years later it still commanded a high price. Miss Saul (1807-1859) whose collection at Cambridge still includes two small specimens of the species, did well to pay such a low price. (The same year, Bryce Wright paid £42 at Dennison's sale and £31.10s eight years later at the Norris sale.) Even by 1963 F. R. Woodward could only confirm the existence of 13 specimens, 6 of which were in Britain (Woodward, F.R., A tentative list of the known specimens of Cypraea (Erosaria) guttata Gmelin. Journal of Conchology, 1963, 25:180-2.)

"Cowries, Porcelaines not from resemblance to China but to pigs. The word porcelain as applied to china is of a later date and perhaps taken from the shells."

"In 1851 the reservoir water pipes of Manchester swarmed with Dreissina of all sizes, ferruginous appearance - The pipes were from 24 inch in diameter to 5 inches - the smallest in which they occurred. The water was very hard (15°) [i.e. 214 ppm as CaCO₃] obtained from a shaft 300 ft in drift clay of N[ew] Red Sandstone. The same reservoir is still used, but soft water (1½°) [i.e. 21 ppm as CaCO₃] is now obtained from Millstone Grit district. Since the change Dreissina has died from the reservoir and pipes. The pipes were sometimes stopped up by dead shells and had to be taken up and replaced (Bateman)."

Much of the information on the prices of specific shells comes from S. P. Dance's Shell collecting: an illustrated history, 1966.

I am most grateful to Norwich Castle Museum for permission to view and to quote from Woodward's copy of his book, and to Mrs. Nora McMillan for bringing F. Woodward's paper on C. guttata to my attention.

Peter Lingwood

GENERAL NOTES

ANNUAL GENERAL MEETING MARCH 1986

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

Rule No. 12. Candidates for nomination to the Council shall be paid-up members of The Society and shall be nominated by two members. Nominations, other than those made by the Council itself, shall be sent in writing to the Hon. Secretary at least six weeks before the A.G.M., and shall be accompanied by a signed declaration of the candidate's willingness to serve.

NOTE: Nominations must be received by the Hon. Secretary NOT LATER THAN 31 December 1985.

RANALD MACDONALD (1910-1985)

Ranald MacDonald joined the Conchological Society in 1930 and although his name is probably unknown to most present-day members of the Society his death in April 1985 deserves mention. He and I were boy and girl together and under the aegis of the late R. J. Welch we did much field-work in Northern Ireland between the two great wars. Ranald was an excellent field-worker and companion, slow, careful and

thorough, and unruffled by misfortune.

He had several periods of employment in the Ulster Museum but was never on the permanent staff.

Unfortunately he disliked writing-up his finds and latterly he was failing physically, consequently the good work he did in natural history (he worked on Crustacea, Amphipoda as well as the Mollusca) in Northern Ireland has tended to be overlooked.

The destination of his papers and collections has not yet been decided.

Nora McMillan, 29 April 1985

ORMER SHELLS - THE RESTORATION OF GOLDNEY GROTTO

Three-and-a-half thousand sea shells collected by the people of Guernsey arrived in Bristol on 17 May to help complete the restoration of the Goldney Grotto which was vandalised on 3 January 1984.

The ormer shells are collector's pieces because they have a sparkling refractive mother-of-pearl surface. They are protected from fishermen and collectors and it is not possible to collect them now from the wild. However, when the Warden of Goldney, Dr. Alastair Summerlee, appealed to the public for help in obtaining more than 20,000 shells of various kinds to restore the Grotto, Mr. John Lintell of the Fisheries Department in Guernsey guessed correctly that many Guernsey people might have collected ormer shells over the years. He appealed to the people of Guernsey through a local newspaper and on local radio. The response has been overwhelming and over 3,500 shells have been donated. Transport to Bristol was arranged by the Guernsey Tourist Board, and the shells were handed over by Mr. Lintell.

Apart from the sea shells, the restoration of the Grotto required 2 cwt of Bristol diamonds, a rare type of quartz rock. The University Geology Department discovered a deposit and the diamonds have been supplied. Other quartz and calcite rocks were also contributed and the work is now nearly complete. The original 18th. century Grotto contained large numbers of ormer shells from the Channel Islands.

The restoration work on the Grotto may be seen at Goldney's next Open Days which take place on 13 and 14 July.

(From University of Bristol Newsletter, 30 May 1985, kindly submitted by Dr. Mike Crane of Bristol Museum and Art Gallery)

FOR SALE - Top quality worldwide specimen shells from the common to the very rare. In particular Cypraeidae, Conidae, Volutidae and Muricidae. Enclose stamp for price list. All enquiries welcome. Alistair Moncur, [REDACTED], Camberley, Surrey. Telephone: [REDACTED].

DIETER SCHIERENBERG BV, Prinsengracht 485-487, 1016 HP Amsterdam, The Netherlands, specialises in Malacological journals and rare books. Please ask for specialised catalogues and offer us your set of Journal of Conchology.

Copy dates for Newsletter contributions

Copy for the March	issue should reach me before	6th. January
" " " June	" " " " "	6th. April
" " " September	" " " " "	6th. July
" " " December	" " " " "	6th. October

Newsletter Editor

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