Mollusc World

November 2018 • Issue 48

The Conchological Society of Great Britain & Ireland

Rewilding at the Knepp Estate

Molluscs of Vancouver Island

Fan Mussels in Dorset

Helping to understand, identify, record and conserve molluscs

From the Hon. Editor

I hope that you have had a good summer and have managed to spend some time pursuing aspects of the conchological interests that we all share. Whilst I hope that you will enjoy the content of this issue of Mollusc World, please help to make the next issue even better by contributing something yourself, from a brief note or observation to a full article. Details of how to submit material can be found on page 31.

UK Conchology (main@ukconchology.groups.io) is a discussion group for members of the Conchological Society and others with an interest in British marine, terrestrial and aquatic mollusca and their shells. This group was previously hosted by Yahoo but for various reasons moved to 'groups.io' earlier this year. They welcome contributions on molluscan topics from beginners and experts alike. Images for identification or interest may be loaded in the Photos section. Membership is by invitation or approval only. When applying, you will be sent an e mail from the group manager (Sarah Lonrigg) asking for your reasons for joining and interests in conchology as these need to be known before membership can be approved. For those who may be interested the following Facebook groups are also running: www.facebook.com/groups/british.marine.mollusca/; www.facebook.com/groups/NE.Atlantic.nudibranchs/ and www.facebook.com/groups/SlugsandSnails/.

At the end of October snails and slugs as pests featured in the media, for example BBC News (see www.bbc.co.uk/news/science-environment-45652170). Lead researcher of an RHS project, Dr Hayley Jones, said that a study showed copper tape, sharp grit, pine bark, wool pellets or egg shells did not ward off slugs and snails and she recommended alternative treatments, such as nematode control. I was pleased to see that the BBC article also explained that only a small proportion of slugs and snails are pest species.

A recent report in the Welsh media on the discovery of a Fan Mussel (*Atrina fragilis*) in the waters of Milford Haven (pembrokeshire-herald.com/48127/rare-fan-shell-found-in-milford-haven-waters/) mirrors the interesting article in this issue on the occurrence of this same species off the Dorset coast. With the continued popularity of diving it is to be hoped that further records of this species will continue to emerge.

Peter Topley

Mollusc World

This magazine is intended as a medium for communication between Conchological Society members (and subscribers) on all aspects of molluscs, in addition to the material found on our web site where a number of back copies are available for viewing. Mollusc World will also be of interest to all those enquiring about this subject or the work of the Society. We welcome all contributions in whatever form they arrive (see page 31 for further details).

The Conchological Society of Great Britain & Ireland

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Front Cover: Knepp Estate field meeting: Martin Willing showing Charlie Burrell and Isabella Tree some *Vertigo* specimens at 'Site 3'. (see page 18) (photo: Mike Allen).

Brought to the Surface: a new beginning for freshwater snail identification

Ben Rowson & Martin Willing

We are delighted to announce that, thanks to the Conchological Society and others, the Heritage Lottery Fund will be supporting a new project about the freshwater gastropods of Britain and Ireland. 'Brought to the Surface' will be based at Amgueddfa Cymru – National Museum Wales for the next two years (September 2018 – September 2020). Along with the Freshwater Habitats Trust, the Field Studies Council, and the Malacological Society of London we will work towards an up-to-date and comprehensive identification guide to all the species in the fauna. We will be holding events (mostly in Wales, hence the bilingual title) to involve beginners and other potential users in helping test different versions of the keys. The Conchological Society logo will be featured on the guide and the Society promoted throughout the project.

The aim is for the new guide to account for recent arrivals, taxonomic revisions, and changing distributions. We will include detailed accounts of the curious 'in-betweeners' not covered by other guides (e.g. *Assiminea*, *Truncatella*, and the hydrobiids), will check the identity of figured specimens with DNA barcoding, and use collections to help illustrate variation in shell morphology, from juveniles to adults. We are particularly keen to investigate any difficult or unusual populations that members themselves may have had trouble with (e.g. *Anisus spirorbis*, as discussed in recent issues of Mollusc World, or the *Stagnicola* group). We will keep the Society updated with future notices, but there are plenty of ways in which members might wish to get involved.

If interested, please email us at ben.rowson@museumwales.ac.uk or martinjwilling@gmail.com.

Viviparus viviparus with *Theodoxus fluviatilis*. (photo: Derek Rands)

Twenty-first century records for the Fan Mussel, *Atrina fragilis* in Weymouth Bay and Lyme Bay

Lin Baldock, Charlotte Bolton, Nick Owen & Cathryn Quick

There is a long history of records for *Atrina fragilis* (Pennant, 1777) in Dorset with Montagu (1803) reporting a shell shown to him by Dr Pulteney of Blandford 'dredged up at Weymouth' which was 5–6" long and 2–3" wide. Pulteney's own descriptions of his finds (Pulteney, 1813) say '*Dredged up at Weymouth: and found after a rough sea on the sands: also at Studland and Swanage*.' Montagu also makes the broad statement: '*It is sometimes taken by fishermen about Torbay and on the Dorsetshire coast*'. Pennant's publication date for the type description of the species is 1777 and states: '*Dredged up at Weymouth. From the Portland cabinet.*' (figure 1). Pennant dedicated his publication to '*the Duchess Dowager of Portland …as a grateful acknowledgement of the many favors conferred by her grace on her most obliged and most obedient humble servant…'* The dowager Duchess was one of the richest women of her time and had accumulated the largest natural history collection in 18th century England, especially shells, doing much of her personal collecting at Weymouth and along the English south coast. Seaward (1990) records only pre-1950 live records for sea area 15 which includes Weymouth and Lyme bays. A useful summary of historical records for the fan mussel around the UK and Ireland and possible reasons for its decline are provided by Solandt (2003), while Willing (2005) summarises the conservation status of the species.

We are aware of four 21st century records for the fan mussel from Weymouth Bay and Lyme Bay, details of which are provided in the table below. The 2016 and 2018 dives were organised by Seasearch which is a project for volunteer scuba divers who have an interest in what they're seeing under water, want to record what they see and want to help protect the marine environment around the coasts of Britain and Ireland.

figure 1: Thomas Pennant's original description and illustration of *A. fragilis* (Pennant, 1777). (photos: Peter Topley)

Date	Location	Depth (m)	Dead/Live	Recorder
2005	Lulworth Banks, Weymouth Bay	~20	L	Scallop diver
Sept 2016	Lulworth Banks, Weymouth Bay	22	D	Charlotte Bolton
Dec 2017	Lyme Bay	42	D	Cathryn Quick
Aug 2018	Lyme Bay, Beer Home Ground	21	L	Nick Owen

2005 – a live specimen over 20cm in length with the top part of the shell broken off (Julie Hatcher, pers. com.).

September 2016 – an unworn, articulated dead shell 12cm long and 6cm wide found at the foot of a low rocky ledge along with whole dead shells of other bivalve species. The shell was obviously extensively damaged during life but the individual survived this event and continued to grow (figures 2 & 3), fan mussels are well known for their ability to recover from damage.

December 2017 (figure 4) a well-worn right-hand valve was found in the lee of a low rock ledge on muddy, mixed sediment, approximate length: 12cm.

August 2018 (figure 5) a juvenile fan mussel about 4cm long embedded in a thin veneer of silt with shell sand and shell gravel over level bedrock. This is the first record of a live fan mussel in Lyme Bay for over a century and is particularly interesting as it indicates the presence of a breeding population somewhere fairly close.

It is interesting to speculate on the origin of this individual given estimates of pelagic larval duration (PLD) and residual current speed and direction in the English Channel and along the English south coast. Stirling *et al.* (2018) identified the larvae of the fan mussel in samples collected off the west coast of Scotland from the Sound of Canna where there is known to be a well-established population of the species (Howson *et al*., 2012) occurring in poorly sorted, mixed muddy sediments in depths of over 100m.

Stirling *et al*. estimated a larval growth rate of 6µm day^{-1} for the fan mussel suggesting length at settlement of up to 770µm for individuals from the Isles of Scilly, which equates to a PLD of up to four months for the Scottish population. Gallego *et al.* (2017) used a PLD of 30-40 days for the fan mussel based on published evidence in their review of connectivity of Scottish Marine Protected Areas. It is known for other species of *Atrina* that growth rate is temperature dependant so larvae in Dorset/Devon waters are unlikely to remain in the plankton for as long as four months, a month or so seems more likely (summer water temperatures in the region of 15°C in Lyme Bay and higher on average in Weymouth Bay). In the Sound of Canna two spawning peaks were identified for the fan mussel: one in summer and another in winter with the largest planktonic larvae found in February and March. Time series collection of larvae suggested 'trickle' spawning throughout the year.

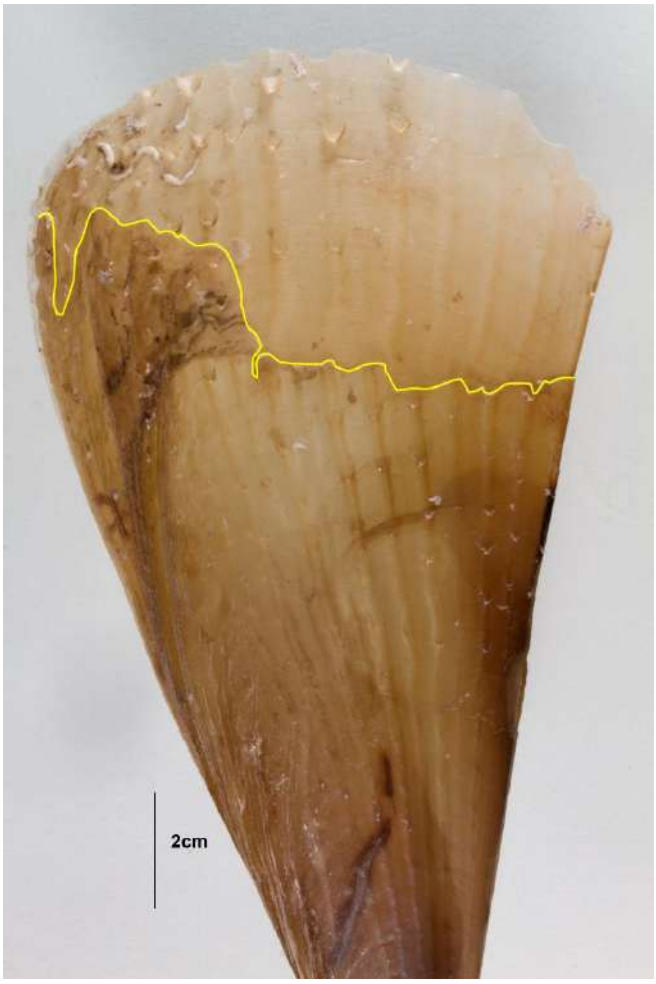

figure 2: Left valve showing a fracture line (yellow) and subsequent recovery to produce a normal shell. (photo: Lin Baldock)

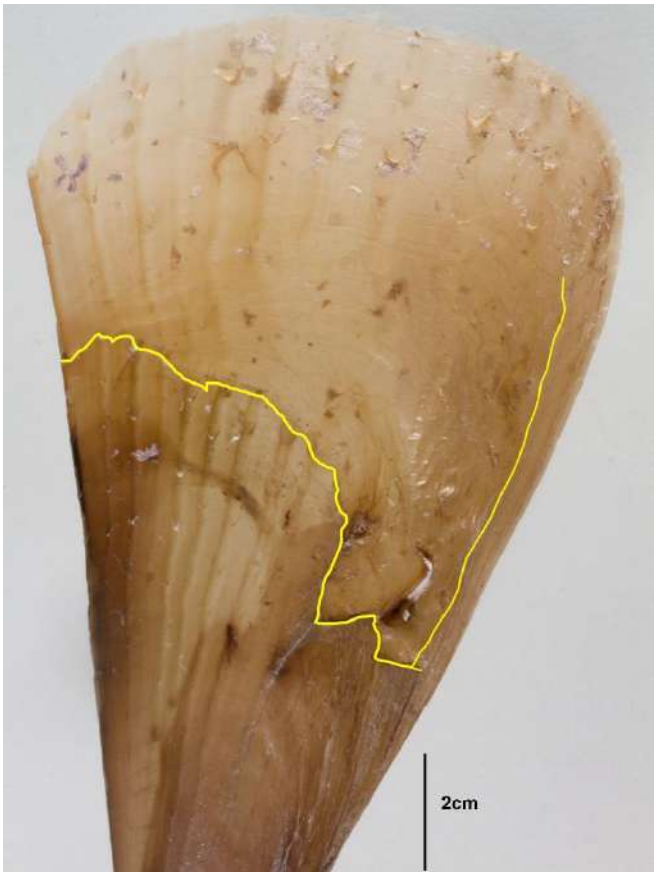

figure 3: Right valve showing a fracture line (yellow) and subsequent recovery to produce a normal shell. (photo: Lin Baldock)

Fryganiotis *et al.* (2013) estimated a growth rate of 1.2cm to 2.6cm per year once settled for a population of fan mussels in the Aegean Sea giving an age range of 7 to 32 years. Growth is likely to be slower at lower temperatures off the Dorset coast, hence the small live fan mussel recorded in 2018 could be four or more years old and the whole shell collected in 2016 up to at least 10 years old given that extensive shell repair was necessary.

figure 4: Well-worn right-hand valve recorded on mixed sediment at 42m depth. (photo: Cathryn Quick)

figure 5: Juvenile fan mussel buried in silt with shell sand and gravel. (photo Nick Owen)

It is unlikely that the larval source for the Lyme Bay individual is east of Portland Bill since residual tidal currents either side of the Bill flow in a southerly direction and do not readily transfer water masses from Weymouth Bay westwards (Pingree and Maddock, 1977; Salomon and Breton, 1993). Salomon and Breton modelled long term trajectories and current velocity in the Channel and their results show that, for a range of tidal and wind conditions, inner Weymouth Bay is largely isolated from both the west and east in terms of potential particle supply or loss. However, Hawthorne and Wiffen (2004) postulated an unusual weather/tidal event resulting in populations of the toothed topshell (*Phorcus lineatus*) derived from Lyme Bay becoming established in the inner parts of Weymouth Bay and Portland Harbour east of Portland Bill. It is therefore likely that subtidal populations of marine species in Weymouth Bay are only intermittently connected with those to the west.

Hiscock *et al*. (2005) suggested that the source of larvae for fan mussels on the English south coast might be from the Bay of Biscay; the species is more abundant on the Atlantic coast of Spain and the Bay of Biscay. This is an unlikely source since deeper water from the Bay of Biscay flows north and west around Ireland and not into the English Channel (Pingree and Garcia-Soto, 2014). Ayata *et al*. (2010) concluded that connectivity between marine populations on the continental shelf of the Atlantic coast of France and the French coast of the English Channel was low for species with a range of larval traits, while Jolly *et al.* (2005) demonstrated a sharp genetic break for the polychaete *Lagis koreni* occurring between the west coast of Brittany and the French coast of the English Channel, again indicating poor connectivity. By contrast on the north side of the Channel, Barnay *et al*. (2003) calculated that populations of the polychaete *Owenia fusiformis* in Plymouth Sound and Salcombe (both localities where live Fan mussels have been recorded recently) could potentially be connected with populations in Lyme Bay and Weymouth Bay. Using a nominal residual current speed of $0.03ms^{-1}$ from Salomon and Breton (1993) it would take an estimated 25 days for particles to travel from Salcombe to central Lyme Bay which is within the likely 40-day PLD limit for the fan mussel. Hence known fan mussel populations to the west of Lyme Bay could in theory provide a supply of propagules to the area.

Finally, it is well worth viewing this short video produced by Scottish Natural Heritage of the population of fan mussels in the Sound of Canna: https://www.youtube.com/watch?v=N4cylwAHVZg

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[(1)]Brother of Gilbert White of Selbourne fame

British Shell Collectors' Club

Saturday 27th April 2019
Shell Convention

This is an opportunity to meet other members and to seek advice from experienced collectors. Activities include members' exhibits and exchange tables, dealers' tables and sometimes an auction of fine specimens and books.

Saturday 26th October 2019
Shell Show

Theydon Bois Community Centre,
Coppice Row,
Theydon Bois,
CM16 7ER.
Open from 9am to 5pm. Admission free.

Please check web site for up to date and further information: www.britishshellclub.org

The Conchological Society of Great Britain & Ireland

Membership update

Please note that to be included here members must sign a data protection consent form. If you have not been included and now wish to be please contact Carolyn Postgate at CIRCA subscriptions (details on page 31*).

Changes of address

Mr C. Audibert
Email: cedric.audibert@gmail.com

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Tel: 07904 456018

*Note that CIRCA also has a new postal address (see p 31)

Beachcombing on Vancouver Island: giants and interlopers *Peter Topley*

This article is based on the Presidential Address given at the Conchological Society's AGM, 14th April 2018, NHM, London.

Vancouver Island lies in the NE Pacific Ocean, just off the coast of Canada and is part of the province of British Columbia. The island is 290 miles long and 62 miles wide at its widest point. The southern part of Vancouver Island is the only part of Western Canada to lie south of the 49th Parallel and has one of the mildest climates in Canada (ranging from about 0.9 °C in winter to a summer maximum of around 28 °C). The island has a population of around 0.75 million and nearly half live in the metropolitan area of Greater Victoria. Victoria is the capital city of British Columbia, but the much larger city of Vancouver is on the mainland, across the Strait of Georgia from Nanaimo.

The island's geology is mostly of volcanic and sedimentary rock which was formed offshore around 55 million years ago from volcanic and warping activity from the subduction of the Kula oceanic plate on the North American continental margin. This process has led to Vancouver Island being one of the most seismically active regions in Canada and the subduction zone off the coast of the island forms a section of the Pacific Ring of Fire.

The east coast of Vancouver Island and the adjacent Gulf Islands form a unique ecological region in Canada. The relatively milder climate and long growing season support many rare species of plants and animals. Unfortunately, it is also one of two areas in British Columbia where the greatest fragmentation, degradation, and loss of natural ecosystems has occurred as a result of intense development pressures.

My title reflects the number of record-sized marine invertebrates that can be found here - the largest chiton in the world, the largest octopus, the largest sea slug, the heaviest sea star, the biggest barnacle. The list of invertebrates includes 68 species of sea stars, over 600 amphipod crustaceans, 75 sea anemones and their relatives, 478 species of polychaete sea worms and 111 species of nudibranchs, so the area is exceedingly rich in marine species.

Possible explanations for the richness of the marine fauna in this area, compared to other areas such as the Atlantic East coast, include the older geology allowing time for species to evolve and diversify, milder water temperatures and the diverse nature of the coastline.

Hundreds of inlets penetrate into the coast range, many of them deeper than the adjacent continental shelf. Numerous small islands break up the twice daily tidal flow, creating strong currents that stir up the nutrients brought down by the rivers and streams. On the western edge of the continental shelf, nutrient-rich waters are brought to the surface by current upwelling during the summer. Blooms of phytoplankton provide the stimulation for the rest of the food chain. Each kind of habitat harbours a different community of marine invertebrates, thereby adding to the overall richness of the coast.

My aim in this article is to highlight some of the typical species of molluscs and other marine life that can be found on the shore by doing nothing more than 'beachcombing'; thus, in many cases living, subtidal or micro species do not feature. I found in the species here an interesting comparison with our own marine molluscs in the UK, because, like us, Vancouver Island lies off the West coast of a continent at a similar latitude but with differing climatic influences. As with every such visit, there are some significant species that I did not encounter on my brief trip, including the well-known and large Geoduck clam (*Panopea abrupta*) in the family Hiatellidae, long-lived (up to around 160 years) and harvested for food; abalones such as *Haliotis kamtschatkana*, or the leathery giant Pacific chiton *Cryptochiton stelleri*, however the species mentioned are probably typical of what can be found in this interesting region.

Victoria region

I begin on the shore at Victoria on the south east coast of the island. The shores here are part of a south facing sheltered bay on the strait of Juan de Fuca, opposite the distant mountains of Washington State. At James Bay cruise ships pass by on the way into port and ferries ply their way to Seattle and other locations.

The shore, as with similar locations on the East coast, consists of mud and sand with rocky outcrops.

The familiar *Mytilus edulis* species complex (probably here also including *Mytilus trossulus* and the introduced European *Mytilus galloprovincialis* with which it hybridises), is the first of the two common intertidal mussels found here. Because of the mussels' wide distribution and because they absorb certain shellfish toxins faster than other commercial species, mussels are used in pollution monitoring programs. A series of mussel stations are maintained, at which regular checks are made for occurrences of red tide and other toxic algal blooms.

The distinctive thatched barnacles (*Semibalanus cariosus)* can be identified by the heavy ridging along the sides of the casing that makes them resemble a 'thatched hut' (figure 1). This ridging is also said to resemble lava spilling out of a volcano. Their growth varies with habitat and the distinctive ridges are more distinctive on younger less crowded individuals. Eggs are brooded in the winter and the cyprid larvae settle in the spring. The larvae preferentially settle near adult barnacle shells. They have a lifespan of up to 15 years. In some locations these barnacles appear to have been a source of food for native tribes.

figure 1: *Mytilus* cf. *edulis* and *Semibalanus cariosus*, James Bay, Victoria.

One of the predators of barnacles, as in the UK, are Dog whelks, *Nucella*, and there are four species including the file dogwhelk (*Nucella lima*) (figure 2) found on the shore of Vancouver Island.

Littorina sitkana, the Sitka periwinkle, is commonly found in the high tidal zone and a typical shell has about ten coarse spiral ribs on the last whorl, with fine spiral microstriae in the gaps between the ribs. However smooth-shelled individuals, as in this case, are also found (figure 2).

figure 2: *Nucella lima* (left) (height (h.) 22 mm) and smooth form of *Littorina sitkana* (right) (h. 19 mm), James Bay, Victoria.

I found shells of the threaded bittium (*Bittium eschrichtii*) amongst beach drift. This species is large for the genus, being around 20 mm in shell height and is distributed from Alaska south to central California. It's also known as the giant Pacific horn snail, but a giant in a small world (figure 3)!

figure 3: *Bittium eschrichtii* (h. 20 mm) Holland Point, Victoria.

As on suitable shores in the UK and Ireland, limpets are common. Around eleven limpet species are recorded from Vancouver Island and are in the family Lottiidae, as opposed to the Patellidae for the larger British species (however the tortoiseshell limpets *Tectura* and *Testudinalia* are now included in Lottiidae).

Of the two commonest species towards the Holland Point end of James Bay *Tectura scutum* is the only Pacific limpet with brown tentacles (figure 4). Living from the mid intertidal to shallow subtidal, it is an active species, moving with the tide and apparently exhibiting a rapid escape response to attack by sea stars. *Lottia digitalis* (figure 5) is found grazing on algae in cracks and crevasses in the high intertidal; and splash zones, on vertical or overhanging rack faces and sometimes on the shells of goose barnacles.

Much of the inner harbour area of Victoria is built up, with embankment walkways, quays and waterside buildings, but at Songhees Point there is a small area of weed covered rocks and muddy gravel (figure 6).

figure 4: *Tectura scutum* (length (l.) 37 mm), Holland Point, James Bay, Victoria.

figure 5: *Lottia digitalis* (l. 24 mm), Holland Point, James Bay, Victoria.

figure 6: Songhees Point, Victoria.

Subtidally *Nerocystis* (figure 7a) was common as evidenced from fronds washed up on shore. It forms dense beds on rocks and is an important part of the kelp forest. It has a large holdfast and a single stipe, topped with a pneumatocyst containing elevated (>1 to 10%) concentrations of carbon monoxide (Seiler *et al.*, 1978), from which sprout the numerous blades.

I was pleased to find a juvenile specimen of *Crassadoma gigantea* under a boulder (figure 7b). The giant rock scallop can grow to 250 mm and live for up to 50 years. The scallop is initially free swimming and later attaches to a suitable substrate. In older specimens the juvenile shape is preserved at the umbo but the colours are lost. Lip plugs and nose rings made from the shell of this species and dating back 2000 years have been found in middens in the Northwest Coast area. Burnt shells were also ground and were used in the preparation of white paint or mixed with other colours in the making of masks, face paint, totems and images on canoes.

The Pacific oyster, *Crassostrea gigas*, was introduced on this coast from Japan in the early 1900's. Shells (some very ornamented as the specimen here) and live individuals are common. Littorinids here were predominantly a species that looked close to *Littorina plena*, but this species can only be confidently separated from *Littorina scutulata* by dissection and differences in egg capsule morphology (Reid, 1996) (figure 8).

figure 7: Left|– Bull kelp (*Nereocystis luetkeana*); Right – A juvenile giant rock scallop (*Crassadoma gigantea*) (l. 52 mm), Songhees Point, Victoria.

figure 8: Left|– *Crassostrea gigas* (l. c. 270 mm); Right – *Littorina* cf. *plena* (h. 14 mm), Songhees Point, Victoria.

Eastern Vancouver Island

I now move to the east side of Vancouver Island, firstly to the north facing shore at Rathtrevor near Parksville, around 80 miles from Victoria. The shores here face the semi-protected waters of the Strait of Georgia, where sediment makes up seventy-one percent of the sea bottom at between 50 and 300 metres depth. Burrowing invertebrates such as sea cucumbers, clams, heart urchins, polychaetes and brittle stars dominate the habitat.

Warning notices were present on the shore addressed to those contemplating the harvesting of clams for eating, advising to check for updates on the presence of harmful algae; at the time of my visit bans were in force in many areas (figure 9).

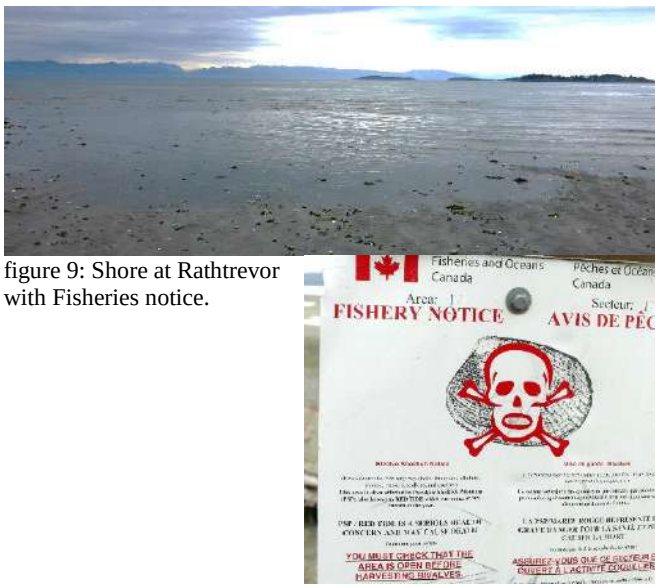

figure 9: Shore at Rathtrevor with Fisheries notice.

Another 'interloper' species, the Japanese Mud Snail or false cerith, *Batillaria attramentaria* was abundant everywhere on the mud, feeding on Sea Lettuce (*Ulva lactuca*) (figure 10). This species was introduced from Japan around the 1920s along with oyster seed. Further south, in California, presence of this species has led to a drastic decline in similar local snails such as the California Hornsnail (*Cerithideopsis californica*).

A familiar bivalve here was *Mya arenaria*; what we would call the 'Sand gaper' but in North America known as the 'Soft shell clam'. This species is not found in native middens on the northwest coast; it is thought that it was introduced in the late 1800s. *Mya truncata* is also present but a widely distributed species and a native.

figure 10: *Batillaria attramentaria* (l. c. 28 mm) feeding on *Ulva*, Rathtrevor.

A couple of species common on this shore and elsewhere have names associated with the naturalist Thomas Nuttall (1786 – 1859) (figure 11). This British born naturalist took part in pioneering expeditions across North America in the early 1800's, discovering previously undescribed species of plants. He was associated in different roles with Harvard Botanic Gardens and the National Academy of Sciences in Philadelphia, but continued his explorations and interest in

different avenues of natural history, before later returning to England for family reasons. His former student, Richard Dana, writes in his travel memoir *Two Years Before the Mast* (Dana, 1840) of his amazement at a chance meeting with Nuttall where he was 'strolling about San Diego beach, in a sailor's pea jacket, with a wide straw hat, and barefooted, with his trousers rolled up to his knees, picking up stones and shells.'

figure 11: Thomas Nuttall (1786 – 1859), style of Bass Otis. (image: public domain)

Nuttall's cockle (*Clinocardium nuttallii*) (figure 12) is a large species (c.140 mm), one of only two members of the Cardiidae found intertidally in the region. It exhibits what is called 'a stunning leaping escape response' to two species of sea stars and is a common host of pea crabs.

The purple mahogony or varnish clam *(Nuttalia obscurata)* (figure 13) was introduced from Japan in the 1980's and I found it abundant everywhere on the high intertidal mud/sand of the Georgia Straight shores. It is considered an invasive species but is apparently harvested for food. A study of reproductive ecology and dispersal potential (Dudas & Dower, 2006) suggested that a 'lengthy planktonic phase, combined with favourable oceanographic circulation patterns, has contributed to the rapid dispersal and geographic range expansion of the varnish clam in the Northeast Pacific'. It has also been able to occupy a niche previously devoid of other bivalves (i.e. high intertidal).

At Piper's Lagoon, Nanaimo, a little further South East from Rathtrevor, smallish (10−12 mm) checkered periwinkles (*Littorina scutulata*) were abundant on stones (figure 14) together with acorn barnacles (*Balanus glandula*), whilst on the mud there were shells of a small tellin, *Tellina modesta* (15 mm).

Departure Bay is only a few miles from the centre of the city of Nanaimo with its yacht harbour, ferry departure points and urban areas. A proportion of the shore here was compacted with hundreds of *C. gigas* with small areas of exposed sand/mud in between. There were also mussel beds and a number of Canada Geese searching for food. Also common here was another familiar 'interloper', *Tapes philippinarum*. Unlike in the UK, this species was first recorded in British Columbia in 1936, again inadvertently introduced from Japan with Pacific Oyster seed. It was here that I first encountered one of BC's large chiton species, the mossy chiton (*Mopalia muscosa*) (50−70 mm) (figure 15). Interestingly, the Mossy Chiton is apparently not affected by accumulations of silt, which might be increased by the presence of many *Crassostrea* shells or turbulence from marine activities.

figure 12: *Clinocardium nuttallii*, Rathtrevor.

figure 13: *Nuttalia obscurata* (width (w.). c. 50 mm), Rathtrevor.

figure 14: *Littorina scutulata*, Piper's Lagoon, Nanaimo.

figure 15: *Mopalia muscosa*, Departure Bay, Nanaimo.

The pulmonate, air breathing seaslug *Onchidella borealis* (related to our own *Onchidella celtica*) was quite common on the exposed mid shore (figure 16). These graze on diatoms from rocks and on algae at low tide. On mechanical stimulation, the marginal tubercles or papillae produce secretions that repel potential predators such as sea stars, which retreat from an encounter. Sea stars will eat dead individuals but not live ones. *O. borealis* lays a gelatinous mass of 6−40 encapsulated eggs which hatch as young juveniles.

figure 16: *Onchidella borealis* (l. c. 15 mm), Departure Bay, Nanaimo.

At nearby Stephenson Point in cracks between boulders were mask limpets (*Lottia persona*), with an distinctive internal mask-like stain behind the apex and a dark margin (figure 17). Large numbers of the anemone *Anthopleura elegantissima* were present (figure 18). This species hosts endosymbiotic, photosynthetic algae in the tentacles, oral disk and column of the polyps. The rate of occurrence of each alga is determined by the temperature and light regimes of anemone habitats. The symbiotic algae contribute substantially to the generation from carbon dioxide of organic compounds in the intertidal zone.

Salt Spring Island is one of a series of small islands in the Strait of Georgia between Vancouver Island and mainland BC. Much of the mud of the shore here was not sturdy enough to walk on, but in addition to some of the bivalve species previously mentioned, shells of the large 75 mm Venerid *Protothaca staminea* were common (figure 19). This species lives buried up to 10 cm in the mud and is one of the species eaten by Black Oystercatchers. The clams can live for up to 14 years but grow rapidly, reaching the legal commercial fishery size of 38 mm in 3−4 years.

figure 17: *Lottia personai* (l. 44 mm), Stephenson Point, Nanaimo.

figure 18: *Anthopleura elegantissima*, Stephenson Point, Nanaimo, BC.

figure 19: *Protothaca staminea*, Salt Spring Island.

A little further North and West along the coast from Nanaimo, Lantzville Bay runs towards Nanoose for 3.5 miles with the Mount Arrowsmith Massif as a backdrop. There are large areas of *Zostera* beds and sand with rocky outcrops (figure 20). The associated eelgrass limpet, *Lottia alveus*, now appears to be totally extinct, but until the late 1920s, this species was apparently quite common in eelgrass beds on the northeastern seaboard. The extinction of *Lottia alveus* does

not seem to have been caused directly by human interference. This small limpet disappeared from the fauna because of a sudden catastrophic collapse of the populations of the eelgrass plant, *Zostera marina*, which was its sole habitat and food source. In the early 1930s, the seagrass beds all along the coastline were decimated by a 'wasting disease' caused by a slime mould of the genus *Labyrinthula*. Some colonies of *Zostera* lived in brackish water, and these areas served as refugia for the eelgrass since the slime mould did not spread to brackish water. The eelgrass was thus able to survive the catastrophic impact of the disease. The limpet however was unable to tolerate anything but seawater of normal salinity, and therefore it did not live through the crisis.
Large colourful sea stars were common along the shore here, as well as Kelp Crabs and a large *Macoma* tellin species, *Macoma secta* with valves up to 100 mm across (figure 21).

figure 20: Lantzville Bay, Vancouver Island, with *Zostera* beds in foreground.

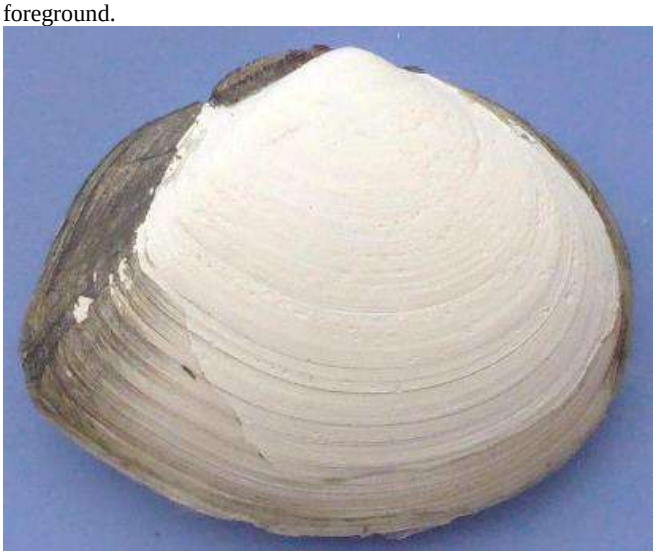

figure 21: *Macoma secta*, from Lantzville Bay.

Pisaster ochraceus (figure 22) uses its tube feet to handle its prey. If the prey is too large to be swallowed whole, it can use its tube feet to open shells. It can evert its stomach through its mouth and engulf its prey, liquify it with digestive enzymes and ingest the processed food. Mussels hold their valves together very securely but *P. ochraceus* can insert part of its everted stomach, or some digestive juices, through the narrow gap that exists where the byssal threads emerge from the shell (McFadden, 2002). The mussel needs to open its valves periodically to feed and breathe and the sea star can exert a powerful traction with its tube feet, pulling the two valves further open. Once the stomach is inside the mussel, digestion takes place. It is thought one sea star can consume eighty Californian mussels in a year.

Further West along the coast from Lantzville Bay is Qualicum Beach. The large expanse of sand here supports a massive Naticid snail, *Euspira lewisii* (figure 23) with a shell size of up to 140 mm. Like other Naticids this species lays its eggs in a characteristic 'sand collar' in the summer months. The snail burrows and feeds on bivalves, drilling through the shell (Morris, 1960). An adult consumes one clam roughly every four days. The empty shells are used by large hermit crabs.

figure 22: Purple sea star (*Pisaster ochraceus*), Lantzville Bay.

figure 23: *Euspira lewisii*, Qualicum Beach, Vancouver Island.

Miracle beach, South of Campbell River (figure 24), faces NE across to Mt. Alfred in the Rockies. On this vast shore Sand Dollar urchins were abundant, mostly the dead tests but occasionally live as well (figure 25). This particular species of sand dollar is known for its interesting behaviour: 'When exposed to a steady flow of water, they gather in groups, forming aligned rows in the sand, while digging their front edge in and raising their back edge into the flow of water, lined up so it passes from right to left across their bodies' (Anon., 2018). Because the sand dollar is of a hydrofoil shape, this draws particles of food closer into its mouth during feeding, enhanced by the alignment of many individuals together into a communal feeding group.

figure 24: Miracle Beach, Vancouver Island.

figure 25: *Dendraster excentricus*, Miracle Beach.

The frilled dog whelk, *Nucella lamellosa* was common here on and around small weed covered boulders (figure 26). It is a variable species that grows up to 80 mm in shell height.

The ones I saw at Miracle Beach were smooth but in sheltered areas they may be ornamented with up to a dozen axial frills which may help to protect against one of their main predators, the red rock crab. They aggregate together in winter and at the time of my visit in spring had laid their stalked egg cases. Also here was another large chiton, Hind's mopalia (*Mopalia hindsii*) (figure 27); growing to around 100 mm in length it feeds on algae, bryozoans, and juvenile barnacles.

figure 26: *Nucella lamellosa* (h. 60-70 mm) with eggs, Miracle Beach.

figure 27: *Mopalia hindsii*, (l. 72 mm) Miracle Beach.

The West coast

On the West side of Vancouver Island the scenery and shores are rather different. Toffino lies on one of the many 'Sounds' or fjords which punctuate the coastal landscape made up of inlets that penetrate inland sometimes for a number of miles (figure 28). The shores of these inlets, where the mountains do not descend steeply into the water, consist of either boulders or areas of mud, while shores that directly face the sea are more exposed with large areas of sand.

figure 28: Clayoquot Sound, Toffino, west coast of Vancouver Island.

In the mud at Toffino were shells of several large bivalves including a species of horse clam in the family Mactridae, *Tresus capax*, the shell of which can reach 180 mm in length (figure 29). Species of this genus are fished commercially by divers and are predated by sea otters. Native peoples traditionally harvest the molluscs in the summer, then cook and dry the flesh, storing it in large cedar boxes for food or trade.

figure 29: *Tresus capax* (w. 134 mm) Toffino.

The other large clam here of about the same size, the Butter Clam (*Saxidomus gigantea*), is a member of the Veneriidae (figure 30). This species was also commercially fished with peak commercial landings in BC in 1938 of 2919 metric tonnes (Harbo, 2007).

figure 30: *Saxidomus gigantea* (w. 97 mm), Toffino.

One of the largest predators of clams on Vancouver Island are the American black bears (*Ursus americanus*) who dig them out of their burrows in the sand. We didn't observe this but saw them lifting up fairly large boulders to find and eat crabs (figure 31). Another predator here are sea otters (*Enhydra lutrisi)* who use rocks as tools to open clams.

Away from the inlets on the sea facing coast, Chesterman Beach is a large expanse of sand and is part of two bays divided by a sandy tombolo which connects a small island to the mainland at low tide. The tell-tale tracks of scavenging Purple Olives (*Olivella biplicata*) were present in the sand, giving away their presence on the receding tide as they burrowed into the sand (figure 32). This shell is used by native peoples for jewellery and ornaments.

figure 31: American black bear overturning boulders for crabs, Clayoquot Sound.

Among the few bivalves on this large expanse of sand were two further species of *Macoma* (figure 33). Apparently *Macoma balthica* lives on this coast as an introduction from the Atlantic, but I did not see any; perhaps they are further South. The one species of Siliqua here is *Siliqua patula*, rather wider shells than we are used to with our species of razor shells (figure 34). This is an edible species and is abundant in many locations along this coast, especially further South in Washington and Oregon.

figure 32: Living *Olivella biplicata* in sand, Chesterman Beach and shell (h. 27 mm) (right).

figure 33: Left − Bent-nose macoma (*Macoma nasuta*) (w. 69 mm); right − Oblique macoma (*M. obliqua*) (w. 32 mm), Chesterman Beach.

figure 34: Pacific Razor-clam (*Siliqua patula*) (w. 161 mm), Chesterman Beach.

figure 35: *Anthopleura xanthogrammica* in rockpool Tonquin Beach.

My tour ends at Tonquin Beach, where rock pools were the home of the impressive Giant green anemone (*Anthopleura xanthogrammica)* which can reach a width of 17.5 cm and column height of 30 cm (figure 35). The anemone feeds on sea urchins, small fish and crabs, but detached mussels seem to be the main food source.

Nearby large beds of the ridged California mussel (figure 36) are witness to a possible local food source for the anemones. My beachcombing tour of parts of Vancouver Island ended on this shore with some more bivalves including a large tellin (*Tellina bodegensis*) and a rather nicely shaped species of Pandora (*Pandora punctata*) (figure 37).

figure 36: *Mytilus californianus*, Tonquin Beach.

figure 37: *Pandora punctata*,(w. 44 mm) Tonquin Beach.

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Red *Planorbarius corneus*

Tom Walker

About 15 years ago I constructed a small pond in my garden. Being a conchologist, I introduced a variety of freshwater snails from a local gravel pit, and the molluscan population is now thriving, with around ten different species. A few ramshorn snails, *Planorbarius corneus*, were added, given to me by a friend from his garden. These were all the normal variety, with both the animal and shell being dark brown.

A few years ago, I was surprised to see a single red *P. corneus*, but no more were seen in following years. This year I cleaned out a large amount of vegetation, and to my delight many more of the red variety were now visible in the newly-clear water, and over the summer numerous individuals revealed themselves on vegetation and on stones in the pond margin (figure 1).

figure 1: Red form of *Planorbarius corneus* in the author's pond.

Planorbarius corneus was first described in Britain by Martin Lister (Lister, 1678), and was entered into the binomial system by Linnaeus (Linnaeus, 1758). The animal described by Lister was certainly the black variety, and it seems that the red form was first reported by Moquin-Tandon who, in 1855, named it *Planorbis corneus β albinos* (Moquin-Tandon, 1855). The first to describe it in Britain was William Nelson in 1879, who found it near Leeds (Nelson, 1879).

So why does this red variety occur? Most freshwater molluscs have a bluish-green pigment, haemocyanin, in their blood cells to transport oxygen. Planorbids, however, are the only molluscan family which are red-blooded, their cells containing haemoglobin, the same red pigment that is found in human blood. The reason for this may be that planorbids are air-breathing, and the greater oxygen carrying capacity of haemoglobin compared with haemocyanin enables them to remain underwater for longer periods without the need to resurface for another breath.

In 'normal' ramshorn snails the red colour of the blood is obscured by the black pigment melanin in the animal and periostracum. giving the species its typical dark brown colouring (figure 2). Occasionally, an albino form occurs in which melanin is absent. This allows the red haemoglobin to be visible in the animal, both in the exposed foot of the animal and through the shell which, in the absence of melaninin, the periostracum is more translucent.

figure 2: Typically pigmented *P. corneus*.

The presence or absence of melanin is probably genetic in origin, but its inheritance is not straight forward; Charles Oldham, in the days when varietal description was all the rage, described three forms varying from the normal: brown shell, red animal (*rubra*), white shell, brown animal (*albina*) and white shell, red animal (*pyrroleuca*) (Oldham, 1928). It is curious that melanin can be absent in the animal but present in the shell, and vice-versa. All these forms have been observed in my garden pond. The role of melanin in planorbids is likely to be multifactorial, but immunity is important; whether those specimens lacking melanin gain any advantage or suffer disadvantage is debateable.

While red *P. corneus* seems to be relatively unusual in the wild, it is freely available in the aquarium trade, where it is often preferred to the normal black variety.

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Report of the Knepp Estate Field Meeting – October 2017 *Martin Willing*

figure 1: Tamworth pigs and Longhorn cattle roam free at Knepp. (photo: Charlie Burrell (Knepp Estate))

An introduction to the Knepp Estate

The Knepp Castle Estate lies on the clay lands of the Low Weald just south of Horsham in West Sussex. The 3,500-acre estate is now owned by Charlie (Sir Charles) Burrell and his wife Isabella Tree who are the latest members of a family that has run Knepp for over 200 years. Until about 17 years ago the estate was managed as a typical mixed arable, dairy and beef farm. At that time Charlie and Isabella took the bold decision to break away from modern farming to begin a 'rewilding' experiment. This initially started in the central estate block with the removal of fences, abandonment of hedge management and re-seeding of arable areas with mixed meadow grasses. The sale of the dairy herd led to the introduction of a diverse range of large herbivores including Tamworth pigs, longhorn cattle, Exmoor ponies and red and fallow deer. This mix was intended to mirror the large herbivore 'megafauna' that roamed Britain in the early postglacial (wild boar, horses and auroch). In the absence of former large carnivores (wolf, lynx and brown bear have yet to win general approval for reintroduction to West Sussex!) these animals have to be managed, providing revenue from the highly esteemed range of organic meats.

An inspiration for the Knepp experiment came from the work of the pioneering Frans Vera, a Dutch ecologist who has challenged the widely held view that the natural climax vegetation of temperate Europe was dense woodland; he suggested that due to the action of large herbivores much of lowland Britain and Europe would have consisted of open pasture-woodland, perhaps resembling what can still be seen in places like the New Forest.

The Knepp rewilding process is slowly expanding so that it now includes more than three quarters of the estate. Outcomes of the rewilding experiment were unknown but, to date, changes have been remarkably rapid; a spectacular wildlife renaissance has occurred. There has been a notable increase in many species that are scarce and declining elsewhere in intensively farmed southern England. Survey and monitoring by a wide range of people (managed by the estate's enthusiastic ecologist Penny Green) have recorded a wealth of fascinating changes. Thus nightingales, turtle doves, skylarks and purple emperor butterflies are just some of many population increases which also include the return of nesting lapwing and long-time absentees such as raven and peregrine. Surveys have also recorded the presence of five species of owl and 13 of bats. Many areas of the estate have also seen a resurgence of some arable weed species that have taken advantage of the ground disturbed by the free-wandering herds. Profound ecological changes are now commonplace. Thus, in the absence of anti-worming ivermectins the estate's cattle produce dung supporting an impressive diversity of dung beetles with as many as 23 species recorded in a single pat including one species, the violet dor beetle *Geotropes mutator,* that had not been recorded in the county for over 50 years.

Apart from an earlier river and wetland survey along a section of the estate's River Adur, little was known about the molluscan diversity and distribution at Knepp. The Conchological Society's 2017 field meeting has made a start, but there is clearly very much more work to be undertaken to develop a biodiversity and distributional baseline that might reveal changes in future years as the re-wilding process continues. It is hoped that this was the first of many future survey involvements on the Knepp Estate by the Conchological Society.

Due to the large size of the Knepp Estate the meeting decided to focus upon selected freshwater, wetland and older woodland habitats (figure 2).

figure 2: Field meeting survey sites on the Knepp Estate.

Day 1: Saturday 14th October
The main day was attended by five Society members: Mike Allen, Robert Aquilina, Mags Cousins, Tom Walker and Martin Willing who were joined by Penny (The Knepp Estate Ecologist) and Dave Green. Four wetland and freshwater sites were selected all lying in the southern block of the estate.

Site 1 - Brookhouse Lagg (TQ 13646 20471):
A slow flowing stream bordered by un-grazed fen vegetation (some dominant plants included: *Juncus* spp, *Juncus* cf *effusus*, *Phalaris arundinacea*, *Cirsium palustre*, *Lycopus europaeus, Urtica dioica)*. A moderately diverse assemblage of aquatic and wetland taxa were recovered (figures 3 & 4). This site produced the most diverse wetland fauna observed during the trip; the presence of numerous *Vertigo pygmaea*, *Vallonia pulchellla* and *Carychium minimum* suggests that this wetland may have been in existence since the time of intensive farming on the estate.


figure 3: Examining material from the vacuum sampler at Site 1 (from L to R: Dave, Penny, Mags, Mike, Tom & Robert.)


figure 4: Mags samples the stream side fen vegetation at Site 1 with a vacuum sampler.

Site 2 – 'Wild-flower Meadow Pond' (TQ 14262 20841):
A partially in-filled pond somewhat shaded by over-hanging *Quercus robur* and with cattle-grazed and poached margins. Associated aquatic and marginal vegetation included: *Lycopus europaeus, Schoenoplectus lacustris, Sparganium erectum, Hottonia palustris, Equisetum fluviatile, Rumex hydrolapathum, Juncus* cf *effusus.* A moderately diverse aquatic molluscan assemblage including presence of the non-native freshwater 'limpet *Ferrisia wautieri*, a species now widespread in ditches and pools throughout West Sussex.

Site 3 – Hammer Pond Stream (TQ 14620 20785):
A small in-flow stream to the Hammer Pond and adjacent lightly cattle-grazed wet 'fen-meadow'. Associated marginal vegetation included: *Iris pseudacorus, Apium nodiflorum, Lycopus europaeus, Sparganium erectum, Phalaris arundinacea, Juncus effusus.* Molluscan species present included a number typical of a small non-hard water stream (figures 5, 6 and front cover).


figure 5: The in-filled pond at Site 2.

figure 6: The team in action at Site 3 (from L to R: Martin, Penny, Dave, Tom, Mags and Robert). (photo: Mike Allen)

Site 4: **- Hammer Pond** (lying between TQ 14406 20705 – TQ 14775 20816): A hammer pond, shallow and narrow at the western end and partially over-shaded by *Salix caprea*, *Quercus robur* (figure 7). A small number of common and widespared species were recorded. The most notable feature of were the large number of swan mussels *Anodonta cygnaea* present many easily able to be lifted from the muddy sediments in very shallow water (figure 8). Penny Green reported that the feral pigs on the estate have been observed to wade into the shallows to lift and eat these mussels. Specimens temporarily examined included specimens up to 13 cm in length suggesting animals many years old (growth rings suggesting > 10 years).

figure 7: The Hammer Pond.

figure 8: Swan mussels (*Anodonta cygnea*) from the Hammer Pond.

Day 2: Sunday 15th October

A shorter second extension-day was attended by Mike, Tom and Penny. Three woodland sites were visited two lying in the south and one in the northern sector of the estate.

Site 5: Tory Copse (TQ 14809 19689): A relatively young deciduous woodland of *Quercus robur, Corylus avellana* and *Acer campestre* (figure 9). Ground conditions were very dry with little top soil and underlying weald clay very close to the surface.

figure 9: Dry woodland at Site 5. (photo: Mike Allen)

Site 6: Brookhouse Woodland (TQ 14037 20207): A long narrow deciduous wood with conditions very similar to Site 5 (figure 10).

figure 10: Dry woodland at Site 6. (photo: Mike Allen)

Site 7: Constables Furze (TQ 15961 23895): A site consisting of open *Quercus robur* bisected by a deep 'v-shaped' gill (figure 11). Although ground conditions were, as at sites 5 and 6 there were moss and lichen covered areas.

figure 11: Penny and Tom search ground litter at Site 7. (photo: Mike Allen)

Sites 5 and 6 produced no living or dead shelled molluscs but only five common and widespread slug species; the dry and probably acid conditions possibly accounted for the molluscan 'poverty' of these sites. The more shaded and possibly humid conditions at site 7 produced a low diversity assemblage of widespread species capable of living in a wide range of habitats.

Survey methods adopted:

Aquatic sites: sediments and aquatic vegetation were swept with 0.5 mm nets; material gathered was both field-examined on shallow trays and bulk samples were removed (to detect smaller species e.g. *Pisidium* spp) for later low-power laboratory examination on white gridded trays.

Terrestrial (including wetland) sites:
In the field a number of techniques were adopted including: (1) the examination of vegetation, plant litter, fallen timber and soil surfaces, (2) the beating of vegetation onto trays to dislodge climbing animals (e.g. *Columella* spp) and (3) at Site 1 the use of a powered vacuum sampler (see figure 3) and (4) the field sieving of vegetation, litter and vacuum samples through 2 mm / 0.5 mm sieve nests.
Offsite / laboratory processing was undertaken on bulk samples of moss / vegetational litter; this was air dried in muslin bags and then sorted with a 2 mm / 0.5 mm sieve nest, the residues being microscopically examined on small gridded trays.
Most slug species were examined and identification confirmed by Ben Rowson.

Discover more about the Knepp Estate and related matters @:

Knepp Castle Estate website: www.knepp.co.uk

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Species Recorded:

	14.10.2017 (aquatic and wetlands sites)				15.10.2017 (woodland sites)		
	1	2	3	4	5	6	7
MOLLUSCA							
Succinea putris	X	X	-	X	-	-	-
Carychium minimum	X	-	-	X	-	-	-
Cochlicopa cf. *lubrica*	X	-	-	-	-	-	X
Cochlicopa spp.	-	-	-	-	-	-	-
Vertigo pygmaea	X	-	-	-	-	-	-
Vallonia cf. *pulchella*	X	-	X	-	-	-	-
Vallonia sp.	-	-	-	-	-	-	X
Discus rotundatus	X	-	-	-	-	-	X
Vitrea contracta	-	-	-	-	-	-	X
Nesovitrea hammonis	X	-	-	-	-	-	-
Aegopinella nitidula	-	-	-	X	-	-	X
Oxychilus cellarius	-	-	-	-	-	-	X
Oxychilus alliarius	-	-	-	X	-	-	-
Zonitoides nitidus	-	-	X	X	-	-	-
Trochulus hispidus	X	X	-	-	-	-	-
Cepaea spp.	X	X	-		-	-	-
					-	-	-
Arion ater	-	-	-	-	X	X	-
Arion subfuscus	-	-	-	-	X	X	X
Arion rufus	-	-	-	-	X	-	-
Arion circumscriptus	-	-	-	-	-	X	-
Arion intermedius	-	-	-	-	-	-	X

	1	2	3	4	5	6	7
Lehmannia marginata	-	-	-	-	X	X	X
Valvata cristata Müller	-	-	-	X	-	-	-
Bithynia tentaculata	-	X	X	X	-	-	-
Physella acuta	-	-	X	X	-	-	-
Galba truncatula	-	X	-	-	-	-	-
Lymnaea fuscus	-	-	X	-	-	-	-
Radix auricularia	-	-	-	X	-	-	-
Radix balthica	-	X	-	X	-	-	-
Planorbis carinatus	-	-	-	X	-	-	-
Bathyomphalus contortus	X	X	X	-	-	-	-
Hippeutis complanatus	-	X	-	X	-	-	-
Planorbarius corneus	-	X	-	-	-	-	-
Acroloxus lacustris	-	-	X	-	-	-	-
Ferrissia wautieri	-	X	-	-	-	-	-
Gyraulus crista				X (dead)			
Anodonta cygnea	-	-	-	X	-	-	-
Musculium lacustre	-	X	-	X	-	-	-
Sphaerium corneum	-	-	X	-	-	-	-
Pisidium subtruncatum	X	-	X	X	-	-	-
Pisidium nitidum	X	-	-	X	-	-	-
Pisidium obtusale		X	-	-	-	-	-
Pisidium personatum	X	-	-	-	-	-	-
Pisidium henslowanum		-	-	X	-	-	-
Pisidium milium	X	X	-	X	-	-	-

The Conchological Society at a Bioblitz at Northam Burrows, Devon.

Sebastian Payne and Peter Topley

figure 1: above: Aerial view of Bioblitz at Northam Burrows Country Park. below: Briefing for participants at the 'Base Camp', Northam Burrows Visitor Centre, 15th June 2018. (photos: Courtesy of North Devon Coast AONB /Cat Oliver)

Northam Burrows Country Park is a headland on the southern shore of the Taw-Torridge Estuary, on the North Devon coast overlooking Barnstaple Bay. The area has a diverse range of habitats including a pebble ridge on the seaward side, dunes, saltmarshes and a grassy coastal plain on the landward, estuary, side (as well as a golf course!). The grasslands are grazed by horses and sheep. It is a Site of Special Scientific Interest and lies within the 'buffer zone' of the North Devon Biosphere Reserve. The Bioblitz was organised by North Devon Coast AONB and took place on 15th June 2018. Three Conch. Soc. members (Bas Payne, Peter Topley and Tom Walker) manned a display table throughout the day (figures 1 and 2) and assisted with mollusc identifications as well as recording in the marine and non-marine environments. Over 320 people attended the day, including 166 schoolchildren with their teachers and helpers.

figure 2 (right): Conchological Society stand at the Bioblitz, with visitors trying a' snail identification quiz'. (photos: Peter Topley)

Bas focused on recording the marine fauna. The most obviously productive area of Northam Burrows is the rocky shore at Westward Ho! However, since a lot of visitors were going there for organised rockpooling, and it had been previously well worked, he decided to head up to the north end of the promontory, where there is a flattish area of more stable cobbles on sand in the mid-tide zone (figure 3), and he worked round the north end of the promontory to a muddy bay (The Skern) on the landward side.

figure 3: Area of stable cobbles on sand, Northam Burrows. (photo: Peter Topley)

The cobble area was moderately productive of species, though live molluscs were in short supply apart from *Phorcus lineatus*, which was abundant (though no juveniles). There were fairly good accumulations of fresh dead shells, though not much in the way of smaller shells apart from plenty of *Abra alba*, and no good shell sand (figure 4). The muddy bay was fairly unproductive - the expected species, but nothing in any abundance).

figure 4: examples of shells collected during the Bioblitz, on display on the Conch. Soc. table. (photo: Peter Topley)

Four species were new to the 10km square (SS43) according to the NBN Atlas:

- *Scaphander lignarius*: three fairly fresh large (L ca. 40 mm) shells, one complete. (figure 5)
- *Kurtiella bidentata*: a single fairly fresh shell.
- *Ostrea edulis*: a few worn shells.
- *Nucula* sp.: several shells, one fairly fresh. Note that it is hard to identify *Nucula* to species level unless they are live or the shells are very fresh. There are no records of any *Nucula* spp. from this hectad.

Tom and Peter recorded land and saltmarsh species, however, apart from common dune species such as *Cernuella virgata* the only other species of interest was the mouse-eared snail *Myosotella myosotis* under a small log in habitat typical for this species (figure 6).

figure 5: *Scaphander lignarius*, Northam Burrows. (photo: Peter Topley)

figure 6: *Myosotella myosotis* (L. ca. 6.5 mm) with *Peringia ulvae* (bottom right), Northam Burrows. (photo: Peter T opley)

Marine mollusc list from Northam Burrows:
Mactra stultorum, Spisula solida, Tellina fabula, Macoma balthica, Scrobicula plana, Abra alba, Ensis siliqua Pharus legumen, Patella vulgata[1]*, Gibbula umbilicalis*[1] *Phorcus lineatus*[1]*, Nucula sp., Anomia ephippium,Mytilus edulis, Ostrea edulis, Cerastodema edule, Acanthocardia echinata, Chamelea gallina, Venus corrugatus, Ruditapes decussatus*[1]*, Littorina littorea, Littorina obtusata*[1]*, Littorina saxatilis*[1]*, Euspira catena, Nucella lapillus, Ocenebra erinaceus, Buccinum undatum, Nassarius reticulatus, Nassarius incrassatus, Scaphander lignarius, Acteon tornatilis, Donax vittatus, Peringia ulvae, Kurtiella bidentata.*

[1] Live molluscs, the remainder shells only.

figure 7: Bas Payne compiling the marine species list, with Tom Walker. (photo: Courtesy, North Devon Coast AONB /Cat Oliver)

Acknowledgements
Thanks are due to Cat Oliver and organisers from North Devon Coast AONB for welcoming CS to participate in this event.

Memories of Stella Turk in Cornwall*

June Chatfield

The first time that I met Stella Turk was in the 1980s in the Cornish Biological Records Unit (CBRU) headquarters at the Royal School of Mines, Camborne, Cornwall although I had corresponded with her before in the 1970s when working at the National Museum of Wales. Whilst staying with my botanist friend Rachel Parry in Newquay, and herself being involved in the natural history scene in Cornwall as well as a near neighbour on the Pentire headland of Conch. Soc. member and Cornish botanist Hazel Meredith (Chatfield and Rowson, 2014); Rachel suggested that we spent a day at CBRU. It was a most inspiring visit and the whole place full of enthusiasm and hard work, with both Stella and her husband Frank Turk presiding over activities. Rachel and I commented on a freshly killed badger by the roadside seen on our way in and Stella immediately got this into the records before we were shown the database and system. At lunchtime a buffet spread was put out for all to enjoy and share when everyone there took a break around a large table. As well as the volunteers, mostly retired people in the week, there were younger folk inputting the data employed on the then Government Manpower Services Scheme that gave young people a chance to gain experience that would lead them to their next paid job. I made subsequent visits whilst in Cornwall in 1989 and 1992, when Stella signed my copy of her book on Cornish seashore life (Turk, 1971) (figure 1).

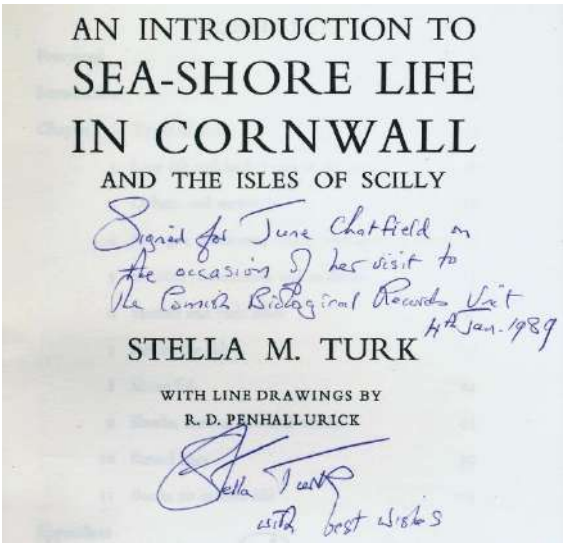

figure 1: Title page of Stella's seashore book with her inscription.

Frank Turk, a biologist in the Adult Education Department, University of Exeter, died in 1986 and also CBRU lost the use of rooms at the Royal School of Mines when the school was transferred to Falmouth, so from then on activities were relocated to Stella's cottage, Shang-ri-la in the small, somewhat isolated, settlement of Reskadinnick in mid-Cornwall.

Over the winter of 2004 I had been talking to Stella on the telephone and on hearing that I was planning another visit to Cornwall in 2005 she invited me to visit. This opportunity happened when I was staying just outside Truro with a former malacological colleague from Reading days, Paula Coward, and by chance a phone call came to Paula whilst I was there from other former Reading friends who had a small farm in Cornwall in their retirement and they had two more ex-Reading friends coming and would we two like to come and meet them. The co-incidence of this was that John and Diana lived near Reskadinnick. As Paula was newly settled in Cornwall and had previously worked for the Surrey Wildlife Trust, she was interested in local natural history contacts so another phone call was made and we arranged to visit Stella on our way back from the farm the next day. This was another stimulating visit to CBRU, now in its cottage location associated with the Cornwall Wildlife Trust. Various local naturalists were around and work being done on the database and another sociable buffet lunch, this time put together by the volunteers (figure 2).

figure 2: Stella Turk at her desk, 2005.

The cottage is tiny, with few rooms and they are all small and made even smaller by being lined with bookcases, leading to Stella's description of life at Shang-ri-la in a letter to Nora MacMillan before her visit as like 'living in crevices between the books' (Chatfield, 2014). I was then led on a tour of the attractively laid out garden of Shang-ri-la, well maintained by Stella and local botanist Rose Murphy who shared the cottage with her. I had met Rose before in 1987 when, with Rachel on a British Bryological Society spring field meeting based at Penzance and she and Rachel had taught biology at the same school in Newquay in the 1960s. At Shang-ri-la further secluded work spaces were available outside in the form of sheds in the garden, the botany hut (Rose's domain), zoology, conchology and archaeology huts where specimens and some books were stored together with work benches below the windows for natural light (figures 3 − 5). We were also shown Stella's secret garden beyond the wall, accessed by a key hidden below a stone tortoise. This was a piece of neglected land and secondary woodland that Stella was advised she could claim and did.

figure 3: Stella Turk, Paula Coward and unidentified volunteer in the garden on tour of the huts (2005).

*These personal reminiscences can be read in addition to the obituary recently published in the *Journal of Conchology* (Light, 2018). Ed.


figure 4: Inside the archaeology hut (2005).


figure 5: Inside the conchology hut (2005).

My next visit was in May 2009 when I was running two consecutive field weeks for the South London Botanical Institute based at the Chichester Guest House in Newquay. Stella had offered to give me access to the file of correspondence between her and Nora McMillan that I wrote about for *Mollusc World* (Chatfield, 2014) and the arrangement was that Hazel Meredith would collect this from Stella on one of her weekly visits and deliver it to me at Newquay to work through during my stay. At the end of this visit, staying on for a few days with Rachel, Hazel invited me to join her to see Stella and return the folder. The photograph of Stella that was used in her obituary in *The Times* (April 2017) was taken on this occasion (see also Chatfield, 2014). There were other photographs taken of her with Rose Murphy, and Hazel who then visited each week (figures 6 and 7). Time had moved on and Stella was less active than before and losing her eyesight but the Cornish naturalists were constantly in and out working the Cornish database and taking over meal preparation too, all a very positive situation of teamwork as well as showing their great regard for Stella's expertise and lifelong contribution to natural history studies in Cornwall. Natural history interests confer many social benefits too.

Although Stella was a very competent identifier of marine molluscs, particularly the tiny ones in shell sand, her interests ranged over the whole of Cornish natural history and its recording. She collaborated with Hazel Meredith and Geraldine Holyoak in an atlas of Cornish non-marine molluscs (Turk, Meredith and Holyoak, 2001). Quite by chance when researching on glow-worms, I came across the British Naturalist's Association report of their glow-worm survey published in their journal *Country-Side* in 1971 and in the listing of Cornish records, many of them were credited 'per S.M.T', clearly Stella Turk (Anon [Wooton 1971]). At one time she contributed articles to the local newspapers (Chatfield, 2014) and she also wrote her own book *Introduction to Sea-shore Life in Cornwall and the Isles of Scilly* (Turk, 1971) that goes beyond seashells. It is evident that Stella played a strong role in encouraging new enthusiasts to study natural history, together with her husband Frank Turk who was a lecturer in the Adult Education Department of the University of Exeter. Cornwall was without its own university but the Camborne School of Mines was a Cornish outpost. The larger part of Stella's life was spent within the county of Cornwall and she rarely travelled outside, an exception being during the time of her presidency of the Conchological Society where she attended several meetings in London (Light, 2018).


figure 6: Stella Turk with Hazel Meredith and Rose Murphy, 2009.


figure 7: Outside the huts: the author with Stella Turk and Rose Murphy (2009). (photo: Hazel Meredith)

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Anon [Wootton, A], (1971) The B.N.A. Glow-worm Survey, *Country-Side*, **21**: 456-462. [No author of this article is given in the contents page, but as Anthony Wootton was the BNA's entomologist as well as editor, the editorial does suggest his authorship of this and a following article.]

Fine art on a flat roof

Clive Craik and Phil Anderson

figure 1: View of the roof, showing how trails were concentrated in wetter parts.

Part of Phil Anderson's house, near Oban in west Scotland, consists of a flat roof of about 7 x 4 metres covered by a butyl-rubber lining. Early in September 2018, Phil noticed that parts of it were covered by an amazing chiaroscuro of curves and spikes (see figures 1−7). The organism responsible was never seen, but comparison with website images showed that the trails had been made by terrestrial snails grazing on algae (see also Mason, 2011 and Llewellyn-Jones, 2011). This removed the dark algal layer to reveal the original pale colour of the rubber surface. Older tracks, probably with regenerating algae, were darker and less well-defined than recent ones. Some trails were wider than others, showing that snails of a variety of sizes had fed there.

The photographs show these and other aspects of the trails. In all the photographs, the scale divisions are mm. Frequent changes in direction of movement can be seen, showing how snails tried to stay within the richest feeding areas. The strongly zigzag nature of each trail was probably caused by the snail sweeping its head from side to side as it moved forward. There are usually five to twelve tooth-like spikes on each sweep. It is this combination of closely packed zigzags and harsh spikes that gives each trail such a striking appearance.

Trails are most closely packed where algal growth is densest, on those parts of the roof where rainwater stays the longest. In drier areas where algal growth is visibly weaker, trails are fewer, feeding sweeps shorter and spikes smaller and fewer. In "deserts" with the sparsest algal growth, the sweeps and spikes vanish and the trails become almost linear, often with rhythmic interruptions perhaps caused by periodic use of the radula to test for algae.

The spikes and zigzags must have been made by the radula scraping algae from the surface. The radula of *Cornu aspersum* (a common garden snail) has 105 teeth in each transverse row, and no fewer than 135 rows – a total of 14,175 teeth (Step, 1945). Perhaps these are in turn organised into five to twelve raised columns that are dragged across the feeding surface. This might explain why each limb of the zigzag holds five to twelve spikes.

figure 2: Closer view showing how trails tend to stay in darker areas, richer in algae. Note the many older trails that have become faded and indistinct.

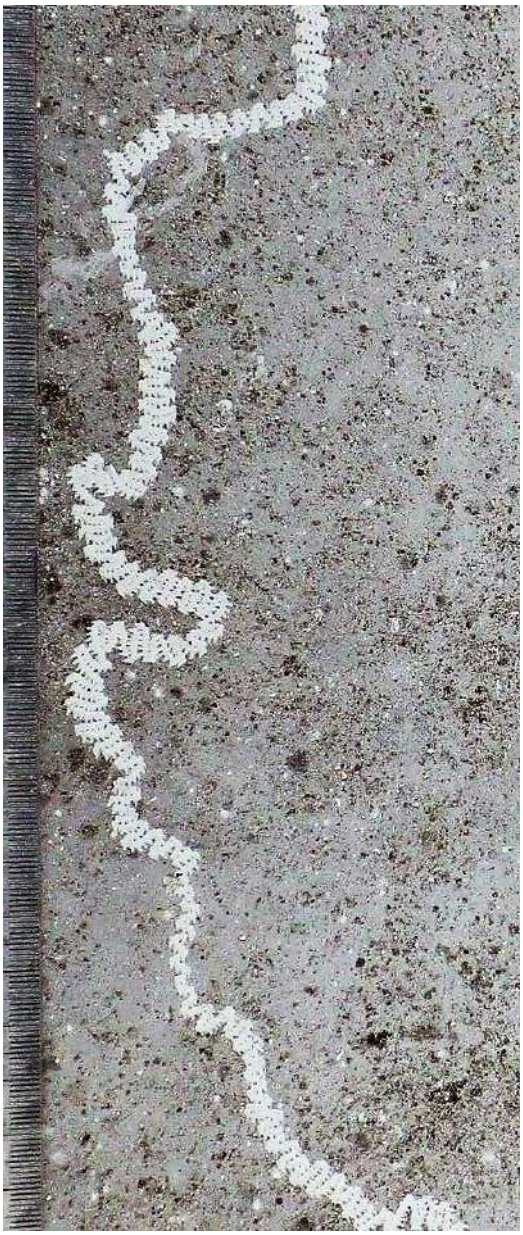

figure 3: The wider parts of this single trail show where the snail fed more intensely. Which is the direction of travel?

figure 4: Closer view of the trail in figure 3. In this trail there are usually 5-8 spikes on each sweep. Why are the spikes pointed?

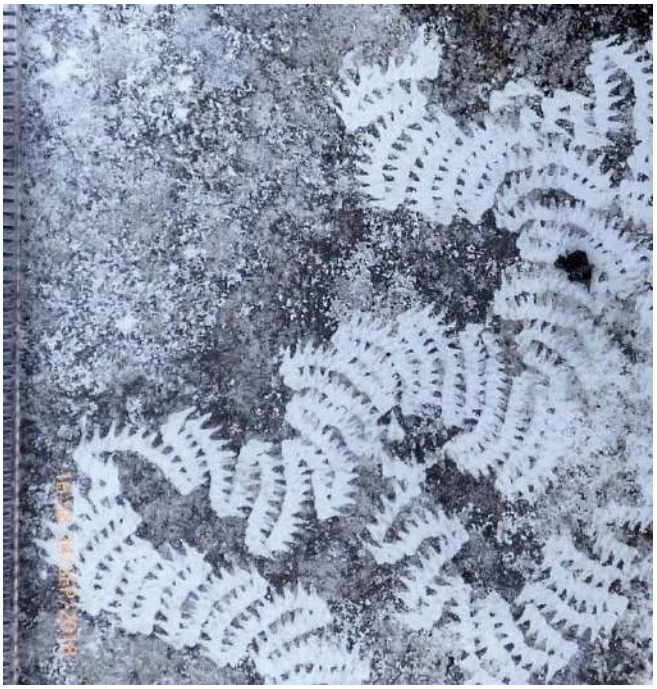

figure 5: Trail left by a larger snail. Here there are 9–12 spikes on each sweep. Does the free end (top centre) imply an abrupt start or an abrupt end to feeding? Bird predation, perhaps?

Neither of us claims any specialist knowledge of this subject. We hope that someone may be able to answer these questions, give a fuller explanation and correct any mistakes.

figure 6: Marks of intense feeding at the inner edge of the roof, where water accumulated.

figure 7. This snail made a large loop in an algal-poor ‘desert’, where it left few or no signs of feeding. Then it returned to the algal-rich area and resumed its feeding movements.

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Photos: Clive Craik

Mussels get a mention in Private Eye

Martin Willing

I recently noticed a short article in Private Eye (no. 1476, p. 39; 10th – 23rd August 2018) under a 'Waterworld' banner and titled 'Mussel strain'. This raised concerns about water abstraction for Sellafield nuclear power station possibly taking precedence over the interests of endangered freshwater mussels. The piece concerned the River Ehen, which supports nationally important populations of the freshwater pearl mussel *Margaritifera margaritifera* (fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 [as amended]). It suggested that, although water scarcity is still a problem in West Cumbria and that water abstraction from Ennerdale Water has been restricted to protect the mussel (with locals being supplied by apparently less palatable borehole water) the needs of Sellafield were, nevertheless taking a 'whopping' 24.6 bn litres of water from the river. Private Eye's article stated that there were no plans to cease this Sellafield abstraction and that no research was being carried out to assess impact of this action on the mussels.

Before considering possible action by the Conchological Society (a letter of protest or concern?) I decided to contact Evelyn Moorkens and Ian Killeen who have been working on the Ehen mussel populations for many years to get their view on this news report (some might remember the excellent talk given by Ian on the Ehen *Margaritifera* conservation work, delivered at the Society's regional meeting in Cambridge in November 2017, reported in the March 2018 edition of this magazine (issue 46, p.12)). They noted that abstraction from Ennerdale had been reduced and was planned to cease by about 2022. They were able to explain that the Sellafield abstraction was from Braystones, a location near the sea and well removed from the Ehen mussel populations, which live much further upstream. In their opinion The Environment Agency had, in fact, undertaken pretty thorough reviews in relation to this matter. So their view was that, '*…it is unlikely that the Sellafield abstraction is taking precedence over the mussels, or affecting them directly. It would be good to look at data on salmon movement – if there happened to be low flows during the salmon* upriver migration, the salmon would get stuck at Braystones, which is the location favoured by poachers in the river*'.

To state the obvious, this episode just goes to demonstrate that you cannot always take news reports, including those involving molluscs, at face value!

Many thanks to Ian Killeen & Evelyn Moorkens in providing feedback that has been used above.

(* salmon being carriers of *Margaritifera* glochidia [which are obligate ectoparasites on salmonoids] and therefore important agents in promoting further successful mussel recruitment in the Ehen)

Snail pastries

These snail pastries were spotted in Delytes Delicatessen in Budleigh Salterton, Devon by Paul and Rosie Dansey. The shells were very lifelike [apparently not real but are you convinced?] and the pastries may have been savoury but they did not buy any to taste!

(photos: Rosie Dansey)

Slovenia Shell museum

Dave Adams sent in a flyer about this museum which he encountered on holiday in the town of Piran on the coast of Slovenia. Dave writes '[the museum] covers fossils, marine and non-marine shells from Slovenia and the Balkans and also worldwide marine. They are very friendly and keen to promote their museum.' More information about the museum can be found on their web site at www.svet-skoljk.si/about/, which states that 'The museum with its permanent exhibition the Magical World of Shells opened on September 13th 2011 under the auspices of the Piran MEDITERANUM institute thanks to the biologist Jan Simič, a collector and owner of a big collection of shellfish and snails, a selection of which is shown in the museum. Jan Simič arranged and enriched the exhibition as well as accompanied it with educational texts. He is also the exhibit's head specialist.'

Detail, Shell Museum, Piran, Slovenia.
(photo: courtesy www.svet-skoljk.si)

Horniman Museum 'Sound Garden'

Peter Topley

Horniman Museum in Forest Hill, London has an outdoor 'Sound Garden' to complement its large collection of worldwide musical instruments. The large-scale percussion instruments, designed to be played by visitors, are inspired by the collection. The instruments comprise a 'spiral scraper' (figure 1), 'bat pipes', 'xylophone wall', 'drainpipe drums' and 'chime run'. The instruments are all tuned to the key of C and are designed to be played together. Instructions are given on how to play them: 'Explore the differences in tone and pitch made by the vibration of the bars, keys and pipes…ask someone to be the conductor.'

My attention was caught by the design of the 'spiral scraper' whose shapes reminded me perhaps of a nautilus shell, a Fibonacci spiral or the Conchological Society's logo!

figure 1 (right): Spiral scraper in Horniman Museum's Sound Garden, complete with rubber-ended mallets.

A molluscan appearance at a prestigious exhibition

Martin Willing

Molluscs can turn up in unexpected places! I was, therefore, surprised to discover one making an appearance in the 250th Royal Academy of Arts Summer Exhibition. This Piccadilly-based event ran between 12th June – 19th August 2018 and has been held, without a break, at the Academy since 1769, the world's oldest open submission exhibition and organised in this anniversary year by Grayson Perry R.A. I spotted the diminutive molluscan entry in the north Sackler Gallery. Exhibit 1,034 (out of a total 1,352 exhibits) is of a rather drab slug and titled '*My name is not Colin'* (figure 1). The tiny sculpture (estimated by viewing through the glass case to be about 7 – 8 cm in length) was made by Eve Parnell with construction described as, 'mixed media and cocktail sticks'.

If you were thinking that this might be something to add to your collection of molluscan *objet d'art* then the piece was advertised at £900. Fortunately, this was not a one-off, but in a limited edition run of 25 similar sculptures; you might still 'snap one up' with an on-line purchase if you act quickly. To view the works exhibited and sold / for sale at the Summer Exhibition then visit https://se.royalacademy.org.uk/.

figure 1: '*My name is not Colin'* by Eve Parnell.
(Photo: https://se.royalacademy.org.uk/2018/artworks/eve-parnell/1034)

Corrigenda and comment on Chatfield, J. (2018) E.W. Swanton: conchologist and museum curator at Haslemere, Surrey. *Mollusc World* No. 47: 18 − 23.

Brian Goodwin

1) p. 18, 2nd paragraph: Swanton was proposed for membership on 7th August 1895, not 18th (*J. Conch*. **8**: 169-170). However, he originally joined in 1892. He was proposed at the 205th meeting, 5th October, 1892 (by J.W. Taylor and W.D. Roebuck), and elected at the 206th (Annual) meeting, 4th November, 1892 (*J. Conch*. **7**: 130, 133). A document in the Archive at Leeds (in Roebuck's hand) records that he resigned in 1894, without giving any reason. *

2) p. 19, 3rd paragraph: Fred Taylor was not J.W. Taylor's brother. Fred was very much working class 'Red Rose', while J.W. hailed from across the Pennines in Yorkshire. I don't believe I have yet traced F.T.'s family, but J.W.T. had two brothers (and one sister), Alfred and Robert T. The younger brother Robert was the other half of Taylor Brothers, the printers who published J.W.T.'s *Monograph* and the *Journal of Conchology*.

3) p. 19, 5th paragraph: "J.G. Jackson" should read "J.W. Jackson".

4) p. 20, 2nd paragraph: The reference to the London Branch may be a little dismissive. All the Branches had relatively small memberships, but that of London was active and comprised some eminent conchologists. Indeed, it formed the new focus of the Conchological Society when the Manchester contingent waned in numbers and influence.

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*June Chatfield comments on this event: 'In his early days Swanton was doing private tutoring, independent school teaching and his [teaching] may have hit a low ebb in employment leading to resignation whilst possibly not wanting to admit to a lack of funds. It was also a low ebb in family farming in that era too, so there was probably no help from the parental direction.' [Ed.]

50 years ago: from *The Conchologists' Newsletter* (no. 27, December 1968)

The *Conchologists' Newsletter* was this publication's predecessor and ran from January 1961 to December 2002.

from **The water tolerance of eggs of land snails**

Dr. A. Richnovsky (Hungary)

For years I have studied the land snail fauna of the inundation area of the Danube, after the abating of small to widespread floods. I was able to establish significant losses in the fauna… However, considerable numbers of adult and young specimens have invariably survived their submersion in water. I also found very young specimens originating from the year in question…explained only by the eggs having somehow survived the flood.

…I found that *Arianta* and *Cepaea* species 'fled' [the slowly increasing water levels] onto bushes and trees in the face of threatening flood, indeed, several specimens advanced to heights of 10−15m on trunks of larger trees. After the flood had passed, however, masses of dead animals covered the floor of the inundated woods. Even shells of explicitly montane species are not rare occurrences at such times; they have been carried away by the waters and then deposited at enormous distances from their original habitats.

My studies became centred on the eggs of land snails, and I have attempted to investigate their means of surviving floods and the effects of high waters on them. I collected many hundreds of *Helix pomatia* (figure 1) eggs in May and June from various points of the inundation area... One line of investigation aimed at gaining information on the means by which the eggs escape destruction by floods, the other concerned the period of submersion in water still allowing survival…

Snail eggs are light, covered externally by a glutinous material, and they stick loosely to one another. Affected by water, they may float on its surface and stick to the bark of tree trunks or the twigs of bushes. In my opinion, only a fraction of the eggs may escape by this method, since after a certain period of exposure to water they sink to the bottom…

The following inferences may… be drawn [from the experiments]:

1. The eggs of land snails are unable to survive prolonged floods.
2. Submersion in water for 5−6 days, though rather detrimental, can still be tolerated and about 50% of the eggs remain alive.
3. Two weeks is the extreme period after which no 'liveable' eggs remain. Thus, prolonged great floods, lasting for a number of weeks, entirely annihilate all eggs laid by land snails.

figure 1: The Roman snail, *Helix pomatia*. Woodhall Park, Herts., 1988. (photo: Derek Rands)

from **Pronunciation*** *A. E. Ellis*

…Scientific names being far more often written than spoken, their pronunciation may perhaps be of little consequence, so long as the meaning is clear. Some degree of uniformity is desirable, however, and one is under an obligation to the ancients to abide by their rules and conform to their customs when borrowing, or looting, words from their rich treasury. Most British zoologists (and botanists) still cling conservatively to the old anglicized style of pronunciation. It might provoke raised eyebrows or even, were the members not so polite, derisive titters if one were to speak of Weewiparus weewiparus, Walwahta piskinahlis, or Waynus owahta at a meeting of the Conchological Society…It is recommended that in the 'old' pronunciation the letter c should be hard whenever it is a transliteration of Gk. kappa. as in *Cepaea*, Cephalopod, etc. ch (=Gk. chi) should strictly be sounded as in loch, though most Englishmen will be content to settle for lock.

The commonest fault is confusion of long and short vowels. Amongst the most frequently mispronounced words are *Helix* with its derivatives and compounds: the first syllable is hell, not heel. The following are some other names in which all vowels are short: *Acroloxus, Ancylus, Calliostoma, cinereoniger, Cochlicopa, Cochlostoma, Colus, crystallina, Glycymeris, Menetus, Modiolus, nitidulus, nitidus, Odostomia, Opeas, Patina, Phaseolus, Rhizorus, Stiliger, subvirescens, Trichia, Trochoidea* (5 syllables).

In *Vitrea* and *Vitrina* the first syllable can be either long or short, though it is customarily pronounced to rhyme with 'it' (the same latitude does not, however, extend to the universally mispronounced word vitamin, in which the first syllable is long, as in vital).

The following is a selection of some other names which are liable to be mispronounced.

- First syllable long, the rest short: *Calopodium, Conoidea* (cf. cone), *Cymatium, Liomesus, pomatia, Pomatias, Sepiola.*
- First and second syllables long: *Cepaea, Loligo* (Lolligo is also an ancient spelling), *Solen.*
- Second syllable long, the rest short: *Carinaria, Charonia, silvaticus, Trophon, Chiton* (though conchologists will always pronounce *Chiton*, and its compounds, to rhyme with Brighton: one might as well expect a gardener to pronounce Anemone, Clematis and Lilium, or a Londoner Eros and Trafalgar correctly).
- Second and third syllables long, others short: *Acteon, Acteonia, arenaria, carinatus, gagates, Arion* (whether one derives the name from the poet Arion, son of Cycleus and Methymna in Lesbos, or from Areion, the winged talking horse by Poseidon out of Demeter).
- All syllables except the third are short in *Eledone* (correctly *Heledone*), *lapicida, striolata.*
- The long syllables in *Cecilioides* are the first, fifth and sixth; in *cimicoides* the first, fourth and fifth; in *lusitanicus* the first and third; in *umbilicaris* the third and fourth; in *Zonitoides* the first, second, fourth and fifth.

It may be mentioned that the first syllable of radula (= scraper), the toothed tongue of Mollusca, is long, although it is customarily mispronounced to rhyme with bad.

How should words based on proper names, whether personal or geographical, be pronounced? As they would have been by their owners or by the natives, or as the Romans might hypothetically have pronounced them? the former practice commends itself as being more reasonable and realistic. For fancy and make-up names there can be no guidance except analogy or individual preference. Mark Twain's observation that 'foreigners spell better than they pronounce' applies with equal force to conchologists...

*Some of the names mentioned are not currently accepted. Ed.

About the Conchological Society

The Conchological Society of Great Britain and Ireland is one of the oldest societies devoted to the study of molluscs. It was founded in 1876 and has around 300 members and subscribers worldwide. Members receive two publications: Journal of Conchology which specialises in Molluscan Biogeography, Taxonomy and Conservation and this magazine. New members are always welcome to attend field meetings and indoor meetings before joining.

Some key contacts (see web site [http://www.conchsoc.org/pages/contacts.php] and 2016 membership list for additional contact details)

HON. PRESIDENT: Martin Willing
14 Goodwood Close, Midhurst, Sussex, GU29 9JG
Email: president@conchsoc.org

HON. GENERAL SECRETARY: Rosemary Hill
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Email: secretary@conchsoc.org

HON. TREASURER: Nick Light
The Old Workshop, West Street, Winterbourne Kingston,
Dorset, DT11 9AX Email: treasurer@conchsoc.org

HON. EDITOR OF THE JOURNAL OF CONCHOLOGY
Anna Holmes, National Museum of Wales, Cathays Park,
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HON. EDITOR OF MOLLUSC WORLD: Peter Topley
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FOR BACK NUMBERS OF CONCH. SOC. PUBLICATIONS
please apply to:
Tom Walker, 38 Redlands Road, Reading, RG1 5HD.
E mail: tom@tmwalker.co.uk

RECORDING AND CONSERVATION

HON. CONSERVATION OFFICER: Martin Willing (see opposite)
Email: conservation@conchsoc.org

HON. MARINE CENSUS RECORDER: Simon Taylor
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HON. NON–MARINE CENSUS RECORDER: Ben Rowson
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E mail: nonmarine@conchsoc.org

SUBSCRIPTIONS and MEMBERSHIP

Please send subscriptions or directly related enquiries to
Carolyn Postgate, CIRCA subscriptions, 14 St Barnabas Court,
Cambridge CB1 2BZ **NOTE CHANGE OF ADDRESS**
E mail: shellmember@gmail.com

For general membership enquiries please contact: -
HON. MEMBERSHIP LIAISON OFFICER: Briony Eastabrook
Rock cottage, Chapel Street, Stow on the Wold, Glos., GL54 1DA
E mail: membership@conchsoc.org

How to become a member

Subscriptions are payable in January each year, and run for the period 1st January to 31st December. Members joining later in the year will receive all publications issued during the relevant calendar year. • Ordinary membership £33 • Family/Joint membership £35 • Under 18 (receiving Mollusc World only) £5 • Student membership £15 • Institutional subscriptions £47
In view of the high cost of postage for distribution from the UK, members living in the Republic of Ireland and Europe will be asked to pay an additional postage charge of £8, and members living in the Rest of the World an additional postage charge of £17.
See website for further details. Payments in sterling only, to Carolyn Postgate, CIRCA Subscriptions, 14 St Barnabas Court, Cambridge CB1 2BZ, (shellmember@gmail.com).
For UK residents we suggest payment by standing order, and if a UK tax payer, please sign a short statement indicating that you wish the subscription to be treated as Gift Aid. Another simple and secure way of paying for both UK and overseas members is by credit card online via PayPal from http://www.conchsoc.org/join. Overseas members may also pay using Western Union, but a named person has to be nominated, so please use the Hon Treasurer's name, Nick Light.

How to submit articles to Mollusc World

Copy (via e mail, typed or handwritten) should be sent to the Hon. Magazine Editor (contact details above). If sending copy using e-mail please include a subject line 'Mollusc World submission'. When emailing several large file attachments, such as photos, please divide your submission up into separate emails referencing the original article to ensure receipt. Electronic submission is preferred in Microsoft Word. Images and Artwork may be digitised, but we recommend that a digital image size 200Kb- 3Mb (JPEG preferred) be sent with your submission. All originals will be treated with care and returned by post if requested. Authors should note that issues of the magazine may be posted retrospectively on the Conchological Society's web site. Copy intended for the March 2019 issue should be with the Hon. Editor prior to 31st January 2019; inclusion in a particular issue is at the Hon. Editor's discretion and depends upon the space available but contributions are always welcome at any time.

Advertisements in Mollusc World

We are pleased to invite advertisements, provided they are in line with the Conchological Society's charitable objectives and responsibilities. Advertisements of shells for sale from commercial shell dealers will generally not be accepted. Please contact the magazine Editor for further details.

Conchological Society of Great Britain and Ireland
Diary of Meetings

Please check website (www.conchsoc.org) for further details/updates,
including other meetings arranged at shorter notice.

Saturday 24th November 2018: WORKSHOP MEETING: Woking, Surrey.
10:00 – 17:00: by kind invitation of Judith Nelson at Hilbre House, Pembroke Road, Woking, Surrey GU22 7ED.
This annual workshop offers members the opportunity to receive tuition and share problems and experiences. Those who wish to come should ring Judith (01483 761210) in advance for more details and to reserve a place.
A fee of £5 will be charged to cover expenses. Please note that Hilbre House is a non-smoking property.

Saturday 8th December 2018: INDOOR MEETING: A Christmas miscellany
14:00 – 17:30: Angela Marmont Centre, Natural History Museum.
The usual short presentations (5 – 20 minutes) by members, which can be anything mollusc-related, with or without exhibits; and also a quiz (with prizes!). This will be followed by a glass of Christmas wine (free!); and then by supper at a nearby restaurant (pay your share …). If you would like to make a presentation, or want a place at the restaurant, please get in touch with Bas.
(Council members please note that there will be a Council meeting before this meeting.)

Saturday 19th January 2019: INDOOR MEETING: Lecture and exhibits.
Guest Speaker: Jon Ablett: Museum Based Fieldwork: Hunting for Type Molluscs on a National and International Scale.
14:00 – 17:00: Angela Marmont Centre, Natural History Museum, Cromwell Rd., London SW7 5BD.
(Council members please note that there will be a Council meeting before this meeting.)

Saturday 23rd February 2019: FULL DAY INDOOR MEETING: Demonstrations, discussion, exhibits and lecture.
Guest Speaker: Simon Taylor: The marine recording scheme in 2019: The Conchological Society and the modern Approach to Marine Mollusc Recording.
11:00 – 17:00: Angela Marmont Centre, Natural History Museum, Cromwell Rd., London SW7 5BD.
The lecture will start shortly after 14:00.
(Council members please note that there will be no Council meeting before this meeting.)

Saturday 6th April 2019: ANNUAL GENERAL MEETING AND PRESIDENTIAL ADDRESS
Speaker: The President: Before and after the Medmerry breach: the story so far.
14:00 – 17:30: Angela Marmont Centre, Natural History Museum, Cromwell Rd., London SW7 5BD.
(Council members please note that there will be a Council meeting before this meeting.)

Sunday 12th May 2019: FIELD MEETING (non-marine): Bioblitz, Churchyard and adjoining Southill Park Estate, All Saints Church, Southill, Beds. Joint meeting with the Bedfordshire Natural History Society (BNHS) and Southill PCC. Leader Peter Topley (01462 615499, magazine@conchsoc.org). We will be recording in the churchyard areas around this rural church and also have permission to access adjacent areas of the private Southill Park Estate. The BNHS nature table will be on display and refreshments will be available. Meet from 10:00 at the church; parking in churchyard (TL 14644 42124; SG18 9LL).

Please note the following provisional dates in autumn 2019 for your diary:
Saturday 19th October 2019: INDOOR MEETING 14:00 (preceded by Council meeting)
Saturday 16th November 2019: REGIONAL INDOOR MEETING
Saturday 7th or 14th December 2019: INDOOR MEETING 14:00 (preceded by Council meeting)

If you intend to attend a **field meeting,** please remember to inform the leader beforehand, and if, on the day, you are held up in traffic or your public transport is delayed, please try to contact the meeting leader if possible.

Indoor meetings at the Natural History Museum take place in the Angela Marmont Centre for UK Biodiversity, Darwin Building. ***Please bring plenty of exhibits and demonstration material.***

We are always happy to receive any suggestions for speakers for indoor meetings, or offers to lead field meetings, and also any suggestions about Society participation in the meetings of local and other societies.

Programme Secretary: *Bas Payne, The Mill House, Clifford Bridge, Drewsteignton, Exeter EX6 6QE; 01647 24515,* programme@conchsoc.org.