June 2003

SYDNEY SHELLER

Newsletter of the Shell Club of Sydney
NSW Branch, The Malacological Society of Australasia Limited ACN 067 894 848

Next Meeting:

26th July 2003

(normally 4th Saturday)
Ryde Eastwood Leagues Club
117 Ryedale Rd, West Ryde, Sydney
1.30 for 2.00pm

Topic: Swains, Ron Moylan (Deferred from June meeting due to shell Auction)

Email Contributions To:
Steve Dean 166 Narrabeen Park Parade, Mona Vale NSW 2103 steve@dean.as

Karen Barnes may type, and email it if you cannot: 1/7-9 Severn St Maroubra NSW 2035

Shell Club of Sydney Mission Statement:
To appreciate, understand and preserve shells and their environment and to share this with others.

Extra, Extra, Read all about it!

Photographer gets picture of molluscan murder being committed!

Cominella lineolata caught red-handed with it's proboscis inserted into the shell of ***Thalotia pulcherrima***. The crime was committed at Port Campbell (Great Ocean Road, Victoria) in January 2003.
Photo Patty Jansen

Some of the topics inside:

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John Franklin
51 Grandview Grove
Seaforth, NSW
Australia 2092

Note: The Sydney Shell Club is a branch of the Malacological Society of Australasia (MSA) It is preferred that you are also a member of the MSA. MSA membership can be organised through Des Beechey
Des@phm.gov.au
26 Malga Ave, Roseville Chase NSW 2069

2002-2003 President's Report

Patty Jansen

Another year has passed and it's time for another report. Our club has continued successful monthly meetings. The attendance has been steady, with about 15-20 people at each meeting. The Ryde-Eastwood Leagues club has continued to provide the satisfactory room for free (except, that is, for a small hiccup in February).

After our 2002 AGM we made the significant decision to host the National Shell show again, in 2006. This is a long way off, but the choice of a venue needs careful consideration, so we have started to explore the options. At this point in time, The Ryde-Eastwood Leagues Club is a hot favourite with members.

At the August meeting Ron Moylan gave a very interesting talk about variations in ***Cypraea mappa***. He also brought a 'blacklight' to show the amazing pink glow this species emits under ultra-violet light. Michael was scheduled to give a talk at the September meeting, but had to pull out due to work commitments at the last minute. Instead, we discussed shell show arrangements and recent finds. Chris presented a shortened version of Michael's talk.

The October Shell Show was very successfully run by John Franklin, Ron Moylan, Steve Dean and Adrian Browne.
In November Ashley gave a talk about Christmas Island with excellent slides and film material.

The Christmas Party, held early December at the restaurant in the club that provides our regular meeting venue, was slightly more subdued than last year, but those who turned up had a good time.

Just before Christmas, we had a field trip to Long Bay, which was very interesting, as we found some shells that are rarely ever found alive in Sydney.

January is traditionally our member's talks meeting, as usually a good deal of regular attendees are away for the summer holidays. This time, however, many of us showed up, and it must have been the most interesting member's talks I have heard in my 15 years of membership of the society. Stephanie talked about her PhD work researching the movement of snails on the forest floor.

Steve had brought in some live Marginellids that had been trawled off Sydney in Des' boat by a joint museum/branch group of people. In February, a slight misunderstanding at the club left us without a room, or so we thought, but there was a room after all. The program was cancelled, however. It turned out to be one of our most productive meetings ever, as we decided to re-instate (if there ever was one) the institute of the Club Library, to be held at John Franklin's house, with John as librarian. Also, in preparation for the National Shell Show, we agreed we needed an Internet presence, and Steve suggested his company might be able to offer just that. We agreed to register the domain sydneyshellclub.net (and in doing so, probably became the first ever shell club in the world to own it's own domain). Steve doesn't waste much time, as a rudimentary website was operational that same night.

We had a field trip to Little Bay, which was very nice, but nothing much of interest was found.

In March Patty talked about shell books and the qualities to look for in books that will stand the test of time. We also had a very successful field trip to Shellharbour.

In April Des talked about his excellent website on the shells of NSW. Des aims, at his website, to include all shells roughly larger than 1cm, that occur in NSW. This means there are some oddly strange species on there, shells that the Australian Museum only has a few specimens of, that come from awfully deep water off the NSW coast. A planned trip to Long Bay was rained out.

In May Michael Keats gave a talk about Kangaroo Island. Steve also reported that his small colour inkjet printer has finally given up the ghost, and obtained approval from the club to buy a colour laser printer with club funds. That must also be a world first.

In the club, our committee has again worked to keep things running. We must all realise that without volunteers to take positions, there will be no club. So we must thank Chris Barnes for his role as secretary. Steve has produced an excellent newsletter and has done a magnificent job on the website. John Franklin has done an excellent job as treasurer and also in his liaison with the Ryde Eastwood Leagues club, for which we are very grateful, as this has not always been easy. Maureen Anderson has done very well as the Raffle Lady. Personally, I have managed to turn up for every meeting this year, which is a mean feat as most of you are not even half aware of all the things that have happened. Often, when debating in my mind whether or not I should go to a meeting, or leave it in the capable hands of Maureen, I have considered the fact that so many in the club are friends, and things must be pretty bad if you can't share problems with friends.

I hope that the next year will be a good one for all.

Meeting Minutes

24/05/03

The meeting was opened by P Jansen at 2.05 pm.

Field Trips
C. Barnes reported on a trip to Long Bay and passed around a number of specimens including;
Strombus luhuanus Linnaeus, 1758, ***Cypraea humphreysii*** Gray, 1825, a juvenile specimen of ***Cypraea arabica*** Linnaeus 1758, and a small (16mm) yet intact specimen of ***Conus ebraeus*** Linnaeus 1758.
M. Keats reported on presentations to Mosman and Pittwater councils. Michaels' was one of five papers delivered to the meetings. National Parks and Fisheries also made recommendations aimed at preventing loss of beach habitat through degradation. Michael described Pittwater Environment Centre as very good and aware equipped with a library and three full time staff. Narrabeen Lagoon has been opened and cleaned (pumped out) and both councils intend to have more eco nights in the future.
A. Miskelly reported on a trip to a site near Stradbroke Island. Ashley described how the mangroves lead out to a coral Reef where he observed a large number of ***Cypraea annulus*** Linnaeus, 1758 feeding around the mangrove roots, ***Ovula ovum*** Linnaeus 1758, feeding on soft corals and finding a number of sinistral pond snails.

General Business
C. Barnes handed around a copy of the "guidelines" and a "registration form" for the Fifth National Shell Show to be held in Adelaide on Saturday 20th and Sunday 21st March 2004 at the Morphettville Function Centre, Morphettville Race Course. Any interested persons can contact Wayne Rumball Ph-08 8381 3987 or Peter Hunt Ph-08 8387 6492 for more information.

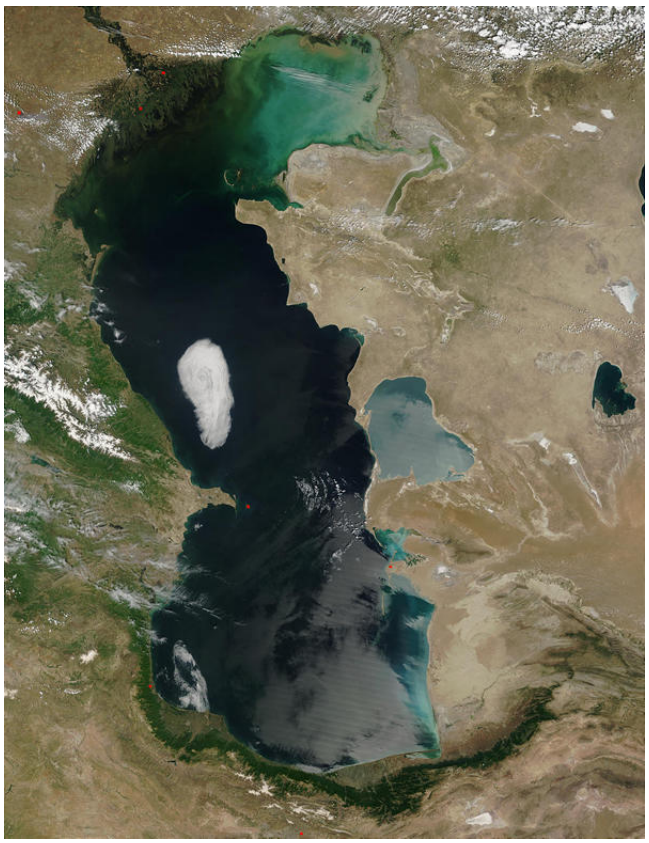
After some discussion it was agreed the committee would investigate RELC as a possible venue for hosting a future National Shell Show in Sydney. J. Franklin will investigate access times and pricing with RELC officials. J. Franklin also circulated a cost estimate from the Novotel Brighton Beach as a possible venue for a future NSS in Sydney.

J. Franklin discussed www.sydneyshellclub.net He suggested recommendations for books, periodicals and links to other sites will need to be updated regularly.

S. Dean reported that his personal printer used for the Sheller had finally failed mid print run of the "Sheller". Steve had investigated a number of options for a replacement and after some group discussion it was decided a replacement laser printer was the best and most economical choice. Three motions were put and unanimously approved by the meeting. 1) For S. Dean to purchase the laser printer on behalf of the branch. 2) The secretary to put a submission to the MSA council requesting financial assistance for said printer. 3) The treasurer to reimburse S. Dean the cost of said printer with committee approval on production of a receipt/tax invoice.

Presentation
M. Keats gave a presentation on his recent trip to Kangaroo Island, South Australia. Michael described some orange coloured trilobites in Cambrian/Pre-Cambrian rocks. Michael talked about how molluscs live in the sand along the coastline, Bay of Shoals, Western Cove and Eastern Cove, a spot known as American River beach is a solid mass of dead shell material. Distrees Bay has sand slowly tapering into deeper water and is apparently a good spot to find paper nautilus though not the day Michael was there. The north side of the Island had some beautiful beaches yet so rugged that there was not much to collect in the way of molluscs. Michael mentioned that the locals are very environmentally aware and will challenge anyone perceived to be doing the wrong thing. The Island has eight wineries and a marron farm with 200 ponds in a pristine environment where you can have a good feed for $20.00. Finally, Michael added that Cape Jervis where you get the ferry over to the Island from the mainland was an interesting spot to observe shells. Michael also circulated a tray of specimens and answered many questions from the group.

Meeting closed at 3.32pm C. & K. Barnes Secretary



Are there any shells in the Caspian Sea?

Patty Jansen

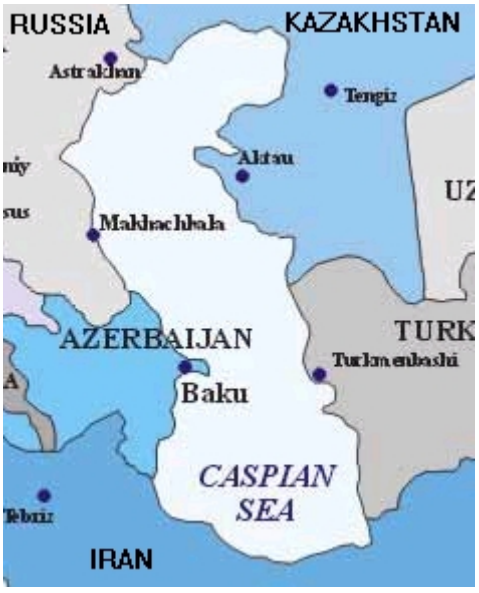
Watching the world go by, literally, from the tiny window of a Boeing 747 is a surreal experience, especially when you're in a slightly sleep-deprived state. Everybody has spent the past hours, in the dark, pretending to be asleep, and you haven't felt the remotest bit sleepy, and now you do and everybody starts bustling about. Everybody that is, except the extremely overweight Muslim woman next to you, who appears to be fast asleep. It is a while since you've realised that the only weapons of mass destruction she is hiding under her chador are her elbows, which shoot out off the armrests at unpredictable intervals to poke you in the side. And can somebody please tell that lady two rows in front to hold the perfume? It's at least another six hours before we get to London!

Meanwhile, everybody seems to be completely oblivious to the spectacular view from the window. The central Eurasian continent is completely cloudless on this early morning in May. The north Pakistani peasants are shovelling their villages out from under longitudinal dunes deposited by a sandstorm. The Afghani mountain ranges are covered in snow, Kabul is an ant's nest. And then, we fly over water. Lots of it. Some is shallow and light blue or vile green, some is deep and dark blue - The Caspian Sea.

From my school days when the world was still divided into two camps, and the former USSR was a great power, I remembered about the two inland oceans in it's southern ranges. The Aral Sea, smaller of the two, is now known throughout the world as an ecological disaster zone since the article about it in National Geographic; it is drying up. It's bigger cousin, the Caspian Sea, looks healthy enough from up here. But immediately I found myself wondering that if I were there, on that long rocky beach next to that desolate track, would I find any shells?

Upon returning home, I decided I would look further into it, and consulted both the internet and Conch-list, where you can always seem to find someone who has at least visited a place, no matter how remote. Here are some of the things I found out.

The area of the Caspian Sea is about 422,000 km2 with 6397 km coastline. The landlocked Caspian Sea is the largest inland body of water on earth. Surrounded by Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan, the Caspian Sea is home to myriad ecosystems. At the meeting point of the Middle East, Europe, and Asia, the Caspian region includes steppe land in the north, cold, continental deserts and semi-deserts in the northeast and east, and warmer mountain and highland systems in the south and southwest. The coastal wetlands of the Caspian basin include many shallow, saline pools, which attract a variety of bird life and biodiversity; over 400 species are unique to the Caspian. In addition, the sea's native sturgeon is famous the world around for the roe it produces: sturgeon from the Caspian Sea accounts for approximately 90% of the world's caviar industry. Many large and small rivers flow into the Caspian Sea, of which the Volga River, entering from the north (see satellite picture), is the largest. The term 'Sea' is a slight misnomer, some people prefer to refer to the Caspian as the largest lake in the world. The truth probably lies somewhere in between. The highest salinity level in the Caspian Sea reaches 12.7 ppt (about 1/3 of the ocean salinity) during summers. The average water temperature in the coastal regions throughout the year ranges from 15.9^{o}C to 17^{o}C. Temperature difference between the coldest area in the north, and the warmest area in the south is 4^{o}C during winter and 16^{o}C during summer. It is my personal guess that there are no or negligible tides.



Conch-list member Konstantin Kopylov (by name a local but now resident in the US) mentions that the zoogeographic origin of the Caspian Sea fauna is very interesting as it stems from five different groups: the native Caspian group - 513 species or 43.8% of Caspian Sea fauna, the arctic group - 14 sp. or 1.2% (Caspian seal for example), the Mediterranean group, the Freshwater group (228 sp) and the marine group. He also mentions that there is a high level of endemism in fishes and crustaceans. The malacological fauna includes 178 species (74 species of Gastropods and 28 species of Bivalves are endemics). Most are small to medium-sized and of the brackish-fresh water type (i.e. small brown things with thin shells). There are also three species of Dreissenidae (freshwater mussels).

Another Conch-list member Harry Lee (also in the US) introduces a rather significant element of the Caspian malacofauna: the Lymnocardiidae, which radiation seems to date way back to the Tethyan Sea. The Caspian seems to have been in communication with that large marine waterbody until the early Cenozoic, and certain derived faunas have been dubbed "Paratethyan."Lymnocardiids are brackish (occasionally fresh-) water-inhabiting cockles with reduced dentition and a wide variety of shapes and sculptures. They are found in appropriate lentic habitats in southeastern Europe and SW Asia. Nowhere is their diversity better expressed than in the Caspian Sea. The group is mentioned in Harry's article in American Conchologist 17(1):14-16 (March, 1989).

Bivalve specialist David Campbell (US) adds that the lymnocardiines and dreissenids are, among the bivalves, the most prominent of the Paratethyan groups. Northward movement of Africa, Arabia, and India closed off the Tethys seaway, a tropical ocean extending across the southern edge of Eurasia, in the Miocene. This created giant brackish lakes in Europe and Asia; the Black, Caspian, and Aral seas being present-day remnants. Along with gastropods and other organisms that managed to adjust to the changed salinity, these groups were able to diversify into a wide range of forms. For example, the only known freshwater cave bivalve is a dreissenid in the Balkans.

Although not an environmental disaster zone like the Aral Sea, the Caspian Sea region is not without problems. One of these is the dramatic fall, until 1978, and then rise, of the water level. Since 1978, the water has risen by more than 2.5 metres. One cannot imagine that these changes have had anything but a devastating impact on the ecosystems of the shoreline.

The region is rich in oil. The fall of the Soviet Union in 1991 led to an increased interest in particularly Azerbaijan and Kazakhstan, from western companies that were previously denied access to the area. However, it is also not exactly the most peaceful region in the world and oil production has so far not led to a major recovery of the area. An article in National Geographic in 1996 doubts if it will in the foreseeable future. There are no regional laws protecting the environment, or regulating the catch of sturgeon. Poverty and the absence of such laws causes poor industrial practices, poaching is rife. The rising water level contributes to the sinking of oil platforms into the water and there is little money, or collective willpower, to do anything about it.

Further information:
http://parstimes.com/SatCaspian.html
http://www.eia.doe.gov/emeu/cabs/caspenv.html
http://medlem.spray.se/davidgorgan/Caspiansea.html

Cone Toxin Patent

Taken From a Sydney News Paper

Privately owned Xenome has been awarded the patent rights to molecules based on cone shell venom. The molecules could help treat urinary tract infections, central nervous system disorders and drug addiction.

Molluscs, A workshop for the Pittwater Council Coastal Environment Centre

Michael Keats
Past President
The Malacological Society of Australasia (NSW Branch)
& Past Vice-President of the Malacological Society of Australasia

The Coastal Environment Centre
Lake Park Road
North Narrabeen
17th May 2003.

Format of the workshop

Basic Biology

Taxonomy and Classification

Economic and Medical uses

Why collect specimens?

Data - collection and Use

The role of the amateur

The Malacological Society of Australasia

Safety in the field

Field Visit venue to be arranged

Basic Biology

What is a mollusc?

The word means 'soft bodied'. In this context we are referring to the animal - not the 'test' or shell that is found on the beach. Correctly, the study of shells is Conchology and the study of the living animal is Malacology.

What we eat as shell- fish are the soft body parts. What is thrown away is the shell. This is the case for oysters, mussels and abalone.

The phylum Mollusca is the second largest on the planet. It is only exceeded by the insects - phylum Insecta.

Molluscs (I will use this term rather than shells) are a very diverse and complex group. They enjoy a huge variety in form and shape, mode of movement and environmental habitat.

Here put specimens on the table and discuss. Marine - intertidal, pelagic, ocean depths, deep sea vents - tropical to polar, terrestrial land, streams, lakes, deserts mountains.

In the 1950's a Danish expedition to Costa Rica discovered in an ocean trough at approximately 4000 metres a living specimen of a shelled animal related to the fossil record. ***Neophilina galathea***. This discovery revived thinking about a Hypothetical Ancestral Mollusc.

Here show overhead of the four main classes of molluscs related to the Hypothetical Ancestral Mollusc

Overhead 1.
Discussion

What are the similarities between the four major groups - Bivalvia, Gastropoda, Cephalopoda and Polyplacophora? I will not discuss the minor groups such as the Aplacophora or the Scaphopoda

Have a brief comment here about other names such as Pelecopoda, Lamellibranchia and Amphineura or Chitons.

The similarities between four major Classes are that they all have a foot and a mantle. All except the bivalves have a radula. The radula is a flexible piece of chitinous material endowed with a very large number of teeth. Radulae have a significant consistency and are useful in achieving a 90% correct ID for a species.

To give some idea of the number of teeth that can fit onto a radula, the common garden snail ***Helix aspersa*** has some 15,000 individual teeth! It is no wonder that they can reek havoc in the garden.

Many species have developed very specialised abilities. For example the genus Conus has modified its radula so that it can extend and retract a significant distance outside the shell. Some Conus species are piscivores and live entirely by catching and eating live fish.

The Genus Conus is also well known for the development of neurotoxins that can paralyse the central nervous system of an adult human in less than 5 minutes.

As stated earlier the molluscs have successfully conquered the land as well as fresh and salt water. These land dwellers are called pulmonates. Again the common garden snail is a typical example. There are also genera that are in transition and have the capacity to live in either environment for different periods of time.

All molluscs have a primitive heart with a ventricle and an auricle. The system is non circulatory and is connected to the Ctenidum. This organ is capable of absorbing oxygen from water.

Reproduction in the molluscs is a varied as can be imagined. There are species with separate sexes, hermaphrodites and species that can change sex during their live cycle (***Crepidula fornicata***). Some species lay eggs, some even nurture the eggs and others discharge sperm and eggs into the water and hope for the best.

Mollusc diets range from the vegetarian to the carnivores with some omnivores. The Naticids for example live on selected bivalves and drill a hole to insert their proboscis into the prey and then draw out the meat and/or juices.

Note we will see limpets grazing and we may even find some evidence of the predators at work

Molluscs do not have an integrated central nervous system. In most cases there is a simple pedal nerve to control the foot and a loop to serve the remainder of the viscera

Classification

The Polyplacophora

The first of the four major classes I will discuss in detail is the Polyplacophora, (Chitons) or colloquially 'coat of mail' shells.

The radula of these shells is located in a transparent sack known as the odontophore. A microscopic examination of this organ will reveal 17 teeth embedded in the radula that in the class is a tough chitinous band not unlike that of a band saw blade. Vivisection studies show that it operates in a reciprocating motion. When you stop to ponder it is well designed for its purpose - scraping algae from rock surfaces. The visceral gland also releases a sugary substance to aid digestion.

Neither the head nor foot of the animal protrude outside the girdle that binds the plates together. The class as a whole can sense light and dark and it is believed that the animals are capable of tasting intended food. Waste material is ejected as pellets to prevent re-ingestion.

The class has a type of blood fluid based on copper rather than iron and is known as haemocyanin

The Gastropods

The class name literally means 'stomach foot'. There are about 35,000 described species in this class and an unbroken fossil record spanning more than 500 million years. This long time span coupled with the relative ease of preservation of the calcareous test as a complete unit have facilitated identification across continents while simultaneously providing evidence for speculation of the evolution of the gastropods from a common ancestor

There are 3 orders of gastropods - Prosobranchia, Opistiobranchia and the Pulmonata.

The Pulmonates are the land and other air breathers; the opisthobranchs include a series of molluscs that either do not have shells or have much reduced shells. Most of the gastropods we will see today on the rock platform will be prosobranchs.

To complicate matters the Prosobranchia re divided into three sub groups designated as the Archaeogastropoda; the Mesogastropoda and the Neogastropoda. We will visit the Mesogastopods in more detail latter.

What are the definitive characteristics of the gastropods?

Single shell or test
Broad foot
Well developed eyes
Well developed tentacles
Large visceral hump
A radula that may be modified

One of the more interesting features of the gastropods that is documented in the fossil record is torsion. Torsion has resulted in a 180 degree anti-clockwise relocation of the animal in its shell.

In pre torsion gastropods the head and the mantle cavity are at opposed ends. In post torsion gastropods the head and mantle cavity are at the same end. How or why torsion developed is not known. One speculative theory is that it made the gastropods as a group more adaptable and able to survive in a wide variety of environments.

Torsion not only affected the animal and the shell but also the nervous system and the digestive systems within

The mesogastropods are arguably the most diverse group of the gastropods. The mesogastropods include the Cypraeidae (cowries) that inhabit a totally underwater marine environment; the Janthinadae (violet snails) which are pelagic and the Littorinidae (winks) that survive wholly out of water and only feed when water splashes into their zone above the high water mark. The pulmonates are also arboreal and live up to heights of 5486 m.

Such a variety of life style and living environments reveals the adaptability of the mesogastropods.

Because the Mesogastropods are such a significant group it is worthwhile documenting some of their diagnostic features

Variety of life styles
Variety of living environments
Separate reproductive system on the right hand side of the animal
Highly developed kidney on the left hand side
Separate sex animals are common
Well developed penis and oviduct within the separate sexes
Presence of chemoreceptors to assess the environment
Mainly scavenger and predator diets
Radulae have only three teeth in a row

Time will not permit us to look at the features of the Archaeogastropods or the Neogastropods

The Opisthobranchs

All are marine
All are hermaphroditic
May be 'de-torsioned'

The Pulmonates

All are freshwater or terrestrial
All are hermaphroditic
All are torsioned
All have relatively heavy shells
The gills are lost and replaced by a vascularized organ in the mantle which acts like a lung and is capable of extracting oxygen from the air
The 'lung' is evidenced by a small opening called the pneuostome.
The nervous system is symmetrical

The Bivalvia

All have two valves that are hinged dorsally
The valves enclose the entire body
The foot is hatchet shaped
The body is compressed laterally
They feature well-developed gills
Usually have separate sexes
Larvae are pelagic
Most live in loose sands and mud
The exceptions are wood and rock borers and free swimmers

The teeth or dentition of bivalves (located in the hinge line) are an important diagnostic tool for shell identification purposes.

Here show some examples

The bivalve animal has no head as such and sense organs are located along the edge of the animal known as the mantle. These sense organs are capable of detecting light, salinity, temperature variations and a number of chemicals. Regrettably many bivalves are filter feeders and are able to concentrate such nasties as heavy metals and a range of bugs that are injurious to human health. Oysters are a well- known example.

Non- sessile bivalve movement is effected by a process of engorging the muscles of the foot, then relaxing those muscles and repeating the cycle many times. The two muscles that control the opening and closing of the valves are called the adductor muscles. These are powerful and provide the defence mechanism for many species. A close examination of any bivalve shell you pick up on the beach will show the adductor muscle 'scars' or points of attachment.

Predators such as octopus rely on superior strength to force the valves apart to enable insertion of their proboscis. Other predators such as the Naticids and Muricids drill neat round holes for the same purpose

Examples

Many bivalves live on the sea floor. This like any floor ends up with all the left overs from activity above. In short it is a dirty place. To cope with this the bivalves have developed complex filaments within the gills to increase the surface area capable of absorbing oxygen.

Another feature of the bivalves is the presence of a strange intestinal apparatus known as the crystalline style. This is a hardened area of the stomach that is apparently a type of food mixer capable of rotation and recycling macerated material into the stomach.

The Cephalopods

Cephalopod means 'head footed' and was coined by the French zoologist Cuvier in 1798. There are about 650 species of Cephalopods in all the seas and oceans of the world. They live between the ocean surface and down to 5,000 metres. All are exclusively marine.

The apparently obvious differences between the Cephalopods, limpets and cockles is superficial. They include the largest invertebrates ever known. The giant squid, ***Architeuthius dux*** measures up to 17 metres. There are five living orders of Cephalopods
Nautiloidea, Sepioidea, Teuthoidea, Vampyromorpha (a single species) and the Octopoda

All have an external skin open at one end
All have a ring of tentacular arms surrounding the mouth
All have a radula and a symmetrical arrangement of teeth
All breathe by feather like gills
All have a pair of horny mandibles like a parrots beak
All have a pair of eyes
All have a funnel beneath the head that circulates water in the mantle cavity and doubles as the organ of locomotion
All are carnivorous and most are active predators

Taxonomy

Take a specimen of ***Haliotis rubra*** and work through the process. Note prepare an overhead for this.

Phyllum : Mollusca
Class : Gastropoda
Sub-class : Prosobranchia
Order : Archeogastropoda
Super Family : Pleurotomaricea
Family : Haliotidae
Genus : Haliotis
Species : rubra

It is also common practice with Malacologists to include the author and the date the species was described. On the identification label would be included Leach, 1814

I will deal with the minimum data set for labels later on.

The systematics of mollusc classification is subject to continuous revision as more and more information is learned. It is now standard practice to use DNA as a diagnostic tool and as more species are reviewed, some may change nominated genera and some even families. There is an agreed international position and I am happy to report that Australia has taken and continues to take a lead role in this vital area.

Economic and Medical applications

The most frequent and obvious economic use of molluscs is as food source. We are all familiar with oysters, mussels, abalone and venerids (vognole). If you are into calamari or octopus then again you are consuming molluscs. More esoteric but becoming more common is the consumption of Turbo and Volute species. A visit to the Sydney Fish Markets will quickly reveal how popular these are.

A student of Australian indigenous history will know that the aboriginal middens are a treasure house of evidence of what the various tribes ate from the sea. A lot of whelks, creepers and clams were a significant part of the diet.

The farming of oysters and mussels is an industry and around the world it is a big business. Pearl farming either fresh water or marine is big business. The city of Broome in North West WA relies very heavily on this industry for its survival and growth. In SA, Victoria and Tasmania the Abalone industry is a major contributor to the gross domestic product.

On the cost side molluscs can be a real problem. Ask the operators of the power stations on Lake Macquarie. Each year they spend thousands of dollars removing mussel growths from the tail water pipes of the power stations. By raising the water temperature as part of the cooling process the power stations have created a tropical growth environment for the mussels and their food supply. The result is startling growth that can quickly reduce the diameter of the discharge pipes by 50% in a matter of weeks.

Less pleasant is the role that molluscs play in the transmission of liver fluke in livestock. In nearly every creek in the country you can find innocent looking little black sinistral snails -known as fluke snails. I will not dwell on the life cycle but suffice it to say that livestock ingest these animals when they drink and the damage is done from that point onwards.

There are many books and publications that discuss the poisonous creatures of the sea. The Blue Ringed Octopus is a spectacular example even though I used to play with them when I was a kid. More significant are the various members of the Conidae or Cone shells. These animals are of enormous importance; not because of the few people who have died from a sting but for the potential they have as very specific pain control in humans. The Conidae generate very complex neurotoxins.

Research in Queensland will lead to the development of a series of new drugs capable of targeted pain control for cancer and other debilitating disease conditions. The neurotoxins are far stronger than any of the opiates without the shocking side effects.

All I can do here in the short time available is open a window on what lies ahead. There is so much to learn and very few readable texts.

Why collect specimens of molluscs?

There are several answers to this question. Collectors of shells usually fall into one of two groups; those who collect for aesthetic reasons i.e. pretty shells, shell art and craft etc and those who collect for the purpose of making a contribution to the state of knowledge of the mollusc fauna. I have a foot in each camp, although I admit to a declining interest in pretty shells for the sake of just having them.

As you probably know I have spent many years familiarising myself with the mollusc fauna of Sydney Harbour and the immediate area around Sydney. This is not because I am not interested in the bigger picture but rather the more I study the more I realise I do not know. Data compiled by fellow amateurs in the 1940's on specific localities makes interesting reading today some 60 years on.

Let me take the example of the common black periwinkle (***Nerita atramentosa***). Specimens of this mollusc were measured from Shark Island in the harbour on several occasions and were commonly reported as being larger than 2.5 cms. Today you would be hard pressed to find one exceeding 2.0 cms. Why? There is no precise answer but lots of opportunity to speculate.

Let them guess (Pollution? Food source? Competition from other species? Etc)

One of the more puzzling issues is the question of distribution of species. This issue is one of my favourites and with a colleague we have established quite a few remarkable range extensions in the last few months of tropical species that are so far from 'home' it is almost inexplicable. Three recent examples are worthy of note. ***Pisana versicolour*** (normally NW Australia to Brisbane); ***Conus chaldeus*** (known southern Limit Lord Howe Island) and ***Pyrene varians*** (confined to the Hawaiian Islands).

In addition there are a dozen or more species whose most southerly range appears to have extended significantly in the last 12 to 18 months. Is this an effect of El Nino? Is it the start of a more dramatic sequence of marine temperature changes or is it an aberration that will correct itself in the next few years?

Other puzzles are created by shipping, either as ballast water imports or as 'illegal immigrants' attached to the hull and dropping off when the ship spends some time in a port. Sydney is now home to two very aggressive NZ species which have the potential to change forever the biodiversity of the existing mollusc fauna.

Amateur collectors are an important adjunct to the professionals in the field. Because Malacology and Conchology are not high profile sciences they have continuing difficulty in attracting and sustaining both government and non- government funding to further our knowledge. Amateurs working in conjunction with the professionals provide a very significant resource.

This assistance ranges from curatorial activity to active field- work. In each of these areas the scope for contribution is huge. For example I try very diligently to visit my current monitoring field site at least once per week. Depending on conditions and the amount of grit on the beach I may spend 2 -3 hours. No museum or university could afford such a luxurious use of paid labour. I come for free and meet all my own expenses. Because I love what I do I really enjoy my time and every 'find' is an advance for our knowledge pool. I should emphasise that I only collect dead beach material. It is only in exceptional circumstance that I would take live material for DNA or similar requirements.

Data collection and use

By now you are possibly gaining some insight into the life of me as an itinerant beach bum. The field- work is just the beginning. The real work starts immediately I leave the site. The first and most vital act is to date and ID the material with the location, collector's name and date in a secure container or bag. These days a GPS reading as well is preferred. This ensures that whatever happens the material is properly identified for future work.

On arrival at home the first activity is to wash the material and remove as far as possible all salt and organic material. The material is then laid out to dry. It is not until it is completely clean and dry that it is safe to re-bag and work on. Depending on the quantity and size of the material match- box trays and or glass tubes are used as individual storage containers. Each container (and there may be a 100 from any visit) must have the minimum data set already referred to.

Computers are marvellous when it comes to label creation. The actual ID of specimens can take a long time and in some cases a trip to the museum reference collection is required. Provided the minimum data set is correct the other information can be added at any time. It is also the case that taxonomic changes are a regular feature of all the biological sciences and the mollusc fauna has dozens reported every year

The specimens now have a real value scientifically. They may not be perfectly complete as specimens but they have data which is invaluable. Larger specimens should have catalogue alpha numeric ID written on them. Smaller specimens should be secured in their containers and the alpha numeric ID written on the container

Why do all this? Let us say we want to find the range of a particular species such as ***Haliotis rubra*** (Leach, 1814). My first approach is a desk search. I visit all my relevant texts and note what is said. The texts will vary but will probably be something vague such as 'mid north coast NSW to Gabo Island.' My specimen is from Coff's Harbour. This is pushing the definition of mid north coast a bit far. I consult my collection and find specimens from perhaps a dozen localities within the range. I re examine the specimen. Could it be something else? I check with several colleagues. And do some more research. A hybrid with ***Haliotis ovina*** is a possibility. I also check with Des Beechey's web site where he is compiling a wonderful illustrated catalogue of all NSW molluscs. Being an electronic book it can be updated continuously. Better still it is a free site.

Here I have the opportunity to read his commentary and also examine pictures of possible alternate species together with their known ranges. I can also talk to him and discuss my find. We may then get together and agree that the range is more extensive and the record can be altered.

Why bother? Well the ***Haliotis*** species are of current economic value and a new fishery may develop.

Moving away from this species to a more concerning example we can look at a species with a very restricted range which is under threat of extinction due to a proposed development. Geographic range data can be crucial in advising the EPA and other authorities. For example the proposed 3rd Sydney Airport would have devastated the remaining Cumberland Plains species of several land snails. These have now had a temporary reprieve.

The Malacological Society of Australasia

See brochure and discuss

Safety in the field.

We are going out onto a rock platform. It is a dangerous place. Many lives are lost every year from so- called freak waves. We are staying in much calmer water but accidents can always happen.

Slips and falls. The rock platform is natures domain. It is not a public footpath. Wear suitable shoes and watch where you put your feet.

Wear a hat, sunscreen gloves to handle specimens and at all times be aware.

The following tabulation extracted from the draft MSA Risk Management Program is reproduced for the information and safety of all participants.

Item	Risk Factor	Protocol	Compliance Measure
Marine sites	Rock platforms tide movements	Check times and height of tide at the proposed site	Tidal info is verifiable with NSW Waterways or similar authority
	Rock platforms slips and falls	Each participant is wearing suitable footwear and has first aid gear	Leader to check all participant is wearing appropriate footwear and carrying first aid gear
	Rock platformsSunburn/dehydration	Each participant is wearing a hat using 'blockout' and carrying sufficient water	Leader to check before the party sets out that each participant is appropriately prepared
	Rock platforms venomous creatures	Each participant is aware of techniques to handle dangerous species and has a glove(s) and suitable containers	Leader to check before the party sets out that each participant is appropriately prepared
	Rock platforms weather conditions	Leader to brief participants on the need to leave the site in the event of a major change in weather conditions	Leader to explain the circumstances for the abandoning of the field trip and that all participants will follow directions should these be necessary

Field Activity

Close of Workshop