DoB Museum Newsletter No. 3 **December 2019**

Curator's note

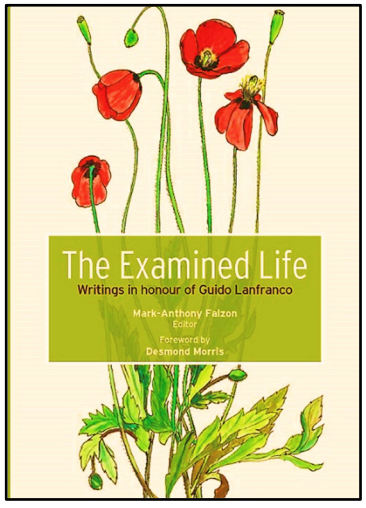
This newsletter is stimulating some interesting online discussions by its readers on points arising from the subjects treated. For instance, the feature on *Potamon fuviatile lanfrancoi* in last month's issue gave rise to an interesting and wide-ranging discussion on taxonomy, legislation, endemism and even branched out to botanical topics; thanks to all who ccontributed. The following extract from this discussion bears reproducing here:

"As to *Potamon fluviatile lanfrancoi*, it is specifically protected in Malta since 1993, irrespective of what the infraspecific rank implies. (This is also applicable to other endemic taxa whose taxonomic status is somewhat 'uncertain'.) Such protection is granted not simply because of its rarity, but also because it is a cultural symbol for Malta. This aspect was also recognised in January 2018, when the species became the 'National Invertebrate' of Malta through the Species Protection (Designation of National Species) Regulations (SL 549.120) under the Environment Protection Act (Cap. 549). This same subsidiary legislation provided additional protection to the species and other species which are far from being endemic to Malta (see for instance *Monticola solitarius, Tetraclinis articulata* and *Aphanius fasciatus*, although on the latter various phenological considerations were made in the past)"[1].

Readers are invited to participate in such online discussions by email to david.dandria@um.edu.mt. Any comments, suggestions and correction of errors are also welcome.

News

10th December saw the launch of a book entitled "*An Examined Life*". This volume is a *festschrift* subtitled "*Writings in honour of Guido Lanfranco*". Guido Lanfranco needs little introduction to many of the readers of this newsletter (especially to the Head of the Department of Biology, his son Sandro!). He is one of Malta's foremost naturalists, historians and folklorists and has authored a number of publications on local flora and fauna including "*Guide to the Flora of Malta*" and "*A Guide to the Fishes of Malta*", among many others. He is also an accomplished artist and illustrated most of his books himself. "*An Examined Life*" bears a Foreword by the internationally renowned zoologist and behavioural scientist Desmond Morris, and I cannot but quote his succinct and accurate portrayal of Guido Lanfranco: "*For Guido Lanfranco…..the pursuit of Maltese history, folklore, geology, botany, zoology, archaeology and prehistory was a lifelong pleasure and one that he is still enjoying at the age of 89 today*".



The DoB Museum is honoured to have a number of specimens which are labelled "*leg.* Guido Lanfranco" or "*leg.* G.G.L". Of special interest is a collection of lichens which he assembled during a visit to Pembrokeshire, Wales in August 1956. The museum also houses a series of life-like and painstakingly accurate models of Maltese mushrooms which are evidence of Lanfranco's botanical expertise and craftsmanship.

Guido Lanfranco will be turning 90 next year. We wish him *Ad multos annos*.

[1] Thanks to Darrin Stevens for permission to reproduce this quote.

Above Left: One of Guido Lanfranco's mushroom models (*Boletus* sp.); Right: *Buellia stellulata*, one of the lichen specimens collected during his visit to Wales in 1956.

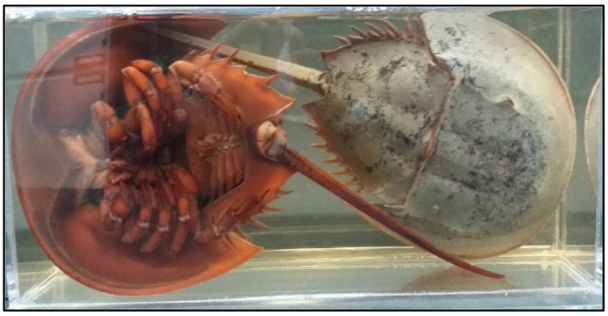
Specimen of the Month

The specimen featured this month is considered to be a "living fossil": *Limulus polyphemus,* the Atlantic Horseshoe Crab. It belongs to the arthropod Order Xiphosura which is represented by several fossil species and only 4 living species: *Limulus polyphemus, Carcinoscorpius rotundicarpia, Tachyplaeus gigas* and *T. tridentatus*. All four are superficially similar and consist of an armoured horseshoe-shaped body with a long pointed tail. The latter feature gave rise to the Order's name Xiphosura which means "sword tail".

The horseshoe crabs have a body divided into three regions: the head region or prosoma, the abdominal region or opisthosoma and the long spine-like tail or telson. The strong armoured covering of the prosoma and opisthosoma is referred to as the carapace. Sexual dimorphism is slight, but females tend to grow to larger dimensions than males and can reach lengths of 60 cm with a weight of just under 5 kg. The prosoma bears 6 pairs of appendages ventrally; the first pair are small pincers which are used to carry food to the mouth which is located between them while the other five pairs are used for locomotion as walking or pushing legs. The opisthosoma also has 6 pairs of appendages but these are not used for locomotion, the first pair having a genital function while the other appendages are modified to serve as plate-like gills. The telson has two functions: as a rudder, and to help in regaining a normal posture following accidental overturning. Horseshoe crabs feed on molluscs, annelids worms and other bottom-living invertebrates. Their habitat includes lagoons, estuaries and mangrove swamps but can extend to depths of 200m, although shallower waters (< 30m) are generally preferred. They have a breeding season during the warmer months of the year when the two sexes congregate in large numbers near the shoreline.

The eyes of horseshoe crabs are especially interesting, and have been used in research into the physiology of vision. *Limulus* has a total of nine eyes: a pair of compound eyes and five simple eyes, or ocelli, on the dorsal surface of the carapace, and two simple eyes ventrally. The compound eyes consist of over 6000 ommatidia and are the important sight organs in adult crabs, while the ocelli are more important during the larval stages. The 1967 Nobel Prize in Medicine was awarded for research on the physiology of vision which partly involved experimentation with horseshoe crab eyes. Another medical application is the *Limulus* amoebocyte lysate test (LAL) which is used for detection of bacterial contaminants in pharmaceuticals and as a test for a number of bacterial diseases.

Dorsal and ventral views of the Atlantic Horseshoe Crab *Limulus polyphemus*.



The DoB Museum's specimens of *Limulus polyphemus*.

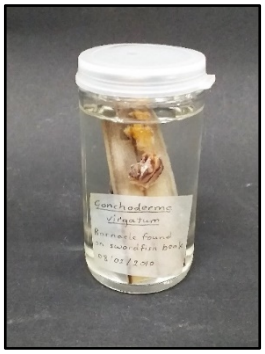
Reference Collections – Cirripedia

The DoB Museum has a small but important reference collection of barnacles, crustaceans which belong to the Infraclass Cirripedia. Barnacles can be mistaken for molluscs because the soft parts of the body are usually enclosed in a hard shell-like exoskeleton. This consists of a number of plates and can be stalked, as in members of the Family Lepadidae or encrusting as in the case of the Chthamalidae. Barnacles feeds by means of their thoracic appendages which are extended out of the shell to capture small planktonic organisms and organic detritus. The Dob Museum's collection consists of 60 specimens comprising 14 species in 12 genera grouped in 7 families. A database of the collection in pdf form is available on request.

Lepadid barnacles are called gooseneck barnacles and are usually found attached to ships' hulls, buoys and floating objects, while the encrusting chtamalids are commonly found in the littoral zone around Malta's rocky coastline. Gooseneck barnacles gave rise to the legend that they would develop into geese, a belief which was held to be true in mediaeval times even by erudite scholars such as Count Michael Maier, the German physician who in 1616 published *Tractatus de Volucri Arborea*, a book purporting to show that geese hatched from barnacles. This idea was taken so seriously that following a public sentence at the Sorbonne, geese were no longer considered to be fowl but fish and could therefore be consumed during lent! One species of goose is called the Barnacle Goose (*Branta leucopsis*) but, take my word for it, it does not arise from any barnacle.

Left: the gooseneck barnacle *Lepas anatifera* with the thoracic appendages extended for feeding; Right: the encrusting *Cthamalus stellatus* found on rocky shores. Both species are common in Maltese waters.

Some barnacles adopt an epizoic mode of life, hitching a ride on large marine animals such as whales and turtles. The Museum has a specimen of the barnacle *Conchoderma virgatum* which was found attached to the beak of a swordfish. Other species (such as *Sacculina* spp.) are parasites, living inside crabs and pushing out an external sac. They obtain nutrients via tendrils which spread throughout the crab's body. A paper by Schembri & Rizzo (1997)[2] provides information on the barnacles found in Maltese waters.



Above left: DoB Museum specimen of *Conchoderma virgatum* on a swordfish beak; Right: Live epizoic barnacle *Conchoderma virgatum*.

Above left: DoB Museum specimen of crab parasitized by *Sacculina*; Right: External sac of *Sacculina* sp. on a crab.

[2] Rizzo, M. & Schembri P.J.S. (1997) The thoracican barnacles (Cirripedia: Thoracica) of the Maltese Islands and surrounding waters (Central Mediterranean) *The Central Mediterranean Naturalist* Vol. 2 (4) 108 - 123

Quote of the Month

"Taxonomy is described sometimes as a science and sometimes as an art, but really it's a battleground."

Bill Bryson (*A Short History of Nearly Everything*)

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Season's Greetings to all

David Dandria, Curator

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