Shells of the Noble Fan-shell, *Pinna nobilis*, known in Maltese as *Nakkra tal-Ħarira*. This is the largest shelled mollusc in the Mediterranean (Photo credit: Patrick J. Schembri)

THE NOBLE FAN-SHELL

The Noble Fan-shell of the Mediterranean Sea was one of the first seashells to be studied – it was initially described by Aristotle of Stagira about the 4th Century BC. It is hardly surprising that this animal caught the attention of that first and among the greatest of marine biologists for not only is this Fan-shell the largest bivalve in the Mediterranean, it is also the largest shelled mollusc in the region. Shells up to 90 cm in length are known so it is easy to see why the Fan-shell is called "Noble". It is equally easy to see why Fan-shells are called thus: the shell has the shape of a half-opened fan. An alternate name for these bivalves is "Pen-shells" but "Fan-shells" is more descriptive.

Fan-shells are bivalve molluscs. The Mollusca is that group comprising the snails, slugs, clams, mussels, octopuses, squid and their relatives. The bivalves are those molluscs having a body compressed sideways and enclosed in a shell made up of two parts. Mussels, oysters, scallops and cockles are common examples. Three species of Fan-shell occur in the Mediterranean, two of which are found in Maltese waters. The commonest, the Noble Fan-shell (scientifically, *Pinna nobilis*), has already been mentioned above. Specimens from the Maltese Islands are usually between 25 and 40 cm long but may grow up to 80 cm. Somewhat smaller and rarer is *Pinna rudis* which grows to a length of some 25 cm. In Maltese both are known as *Nakkra tal-Ħarira* or simply *Nakkra*. Both species live on sandy or muddy bottoms at depths ranging from 1 to 20 m although they are commonest at around 12 – 15 m. The living mollusc has the thin end of the shell embedded in the sand or mud so that the animal looks like a fan sticking upright out of the sediment. It is quite difficult to dislodge the shell from the sediment. The reason for this is because the animal is not simply embedded in the mud but is actually attached to buried stones or other objects. A structure in the lower part of the animal, called the foot, carries a gland which secretes a fluid which when it hardens becomes tough silky strands. These are called byssus threads and serve to attach the Fan-shell to its buried anchors.

In some parts of the Mediterranean, the long golden-yellow byssus threads of the Fan-shell were collected and then spun and woven into such articles as gloves. Taranto in the south of Italy was quite famous for this cottage industry. Fishermen from this region collected Fan-shells by means of an

apparatus called a *pernonico*. This consisted of two semicircular iron bars fastened together at the ends but separated in the middle. The fisherman would drop this over the Fan-shell projecting from the mud and then twist the *pernonico* around until the byssal threads detach and the shell could be hauled up. Nowadays some articles are still woven from Fan-shell byssus threads for sale as souvenirs. This industry was also practised in the Maltese Islands. The Rev. Henry Sedall reporting on the Fan-shells of the Maltese Islands wrote "... common in harbours within reach of a boat or a pole hook. They project from the mud from amongst the Zostera roots to which they are attached by their silken cable. Of this silk, which is of fine texture, but heavy, I have seen gloves made" (*The Mediterranean Naturalist* **2**(13): 201 – 202 (1892)). At the time of writing this industry was apparently already extinct from the Islands, however it is still preserved in the Maltese name for the Fan-shell: *ħarir* means "silk" in Maltese.

Fan-shells feed by filtering out edible material from seawater. They do this using the gills which apart from being respiratory organs are also the animal's feeding structures. The gills are covered with thousands of microscopic hairs that beat constantly in the water causing a current to enter the shell cavity. This current enters from the rounded part at the wider end of the shell and exits near the top. As water passes across the gills particles are filtered out and sorted. Edible material is ingested while rejected material is expelled with the outgoing current. Spending all their lives sticking upright in the sediment filtering seawater, these animals are highly susceptible to having the top part of their shell broken off. Large fish such as rays which forage on the bottom often break the shell as do fishermen's trawls. The Fan-shell however has a defence against this. At the slightest disturbance the animal contracts violently such that the tissues end up in the lower one third of the shell cavity and below the level of the sediment. The Fan-shell is also able to repair the shell very quickly, depositing up to a centimetre of shell overnight. Most Fan-shells will show signs of damage and repair so the animals are obviously well able to cope with the problems of their immobile existence.

Fan-shells are quite notorious for housing "guests" in their large shell cavity. Tiny crabs, called Pea-crabs because of their size and shape, are often found in the upper part of the shell cavity of Fan-shells. These crabs benefit from the safe refuge afforded by their host. They are not parasites and they do not harm the Fan-shell. The crabs feed by filtering out edible material from the current generated by the Fan-shell's gills. Another animal which sometimes makes its home in the shell cavity of Fan-shells is a shrimp called *Pontonia pinnophylax*. Inside Fan-shells these shrimps are always found in pairs, a male and a female. The reason for this is that once a host has been selected, the shrimps never leave but settle for life. Pea-crabs and *Pontonia* are not exclusive to Fan-shells but are also found in other bivalves and in sponges. However, these animals are never found free-living but always as "guests" of some other creature.

Once common in our waters, the Fan-shell is now on the decline due to overfishing. Although no longer fished for their byssus, being large and showy shells, Fan-shells are still collected to be sold as curios or souvenirs. Obviously, the larger the shell the higher the price fetched. Often the inside of the shell is painted on in oils and these embellished shells also fetch higher prices. However, unless this trade in Fan-shells is controlled, perhaps by the introduction of size limits and quotas, it is likely that this superb creature will become rare in our waters and most people will only be familiar with this animal as a painted dead shell hanging on a wall or displayed in a showcase.

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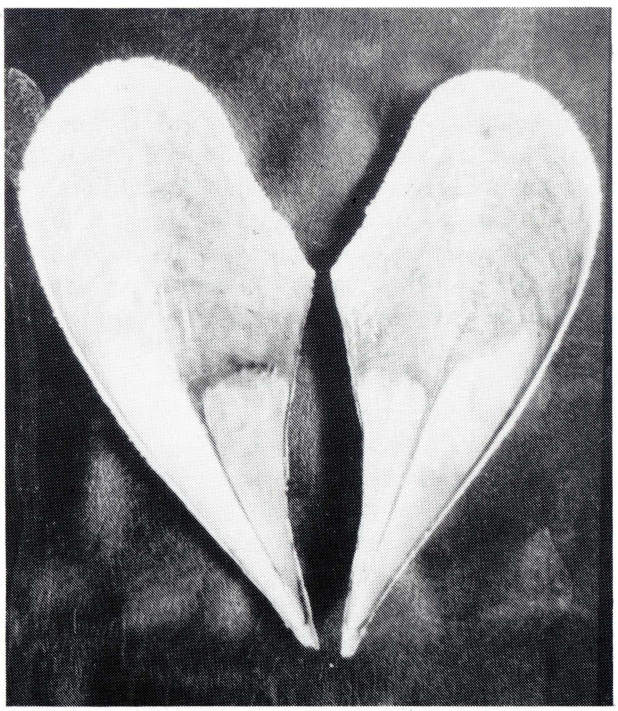
FURTHER READING

Cachia, C. (1972) *Pinna nobilis* L. *The Maltese Naturalist* **1**(3):24

Lanfranco, G. (1979) Crustaceans hosted by *Pinna nobilis* Linn. *Potamon* **3**: 34.

Yonge, C.M. and Thompson, T.E. (1976) *Living marine molluscs*. London: Collins; 288pp.



A large specimen of the Noble Fan-shell showing the shell from the outside and the inside. The shell shown measures 42cm in length
(Photo credit: Patrick J. Schembri)