MOLLUSCS IN INDIAN TRADITION AND ECONOMY[1]

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THE molluscs constitute a natural resource of sizeable magnitude in many parts of the world. They are an age-old group represented among the early fossils, a group of great diversity in size, distribution, habitat and utility. The range of their distribution is as extensive in space as in time for it covers terrestrial, marine and freshwater habitats. They include members from the tiny estuarine gastropod *Bithynia* and small garden snails to the Giant Clam *Tridacna* or the Giant Squid *Architeuthis*. Their use as ornaments, utility articles and medicine has been widespread from ancient days. Not all molluscs, of course, are so helpful or even harmless. Even as in the humans that exploit them, there is in their midst an effective section that hides behind the goodness of others to indulge in a spot of mischief of their own. The sacredness of the Chank is countered by the sin of the snail-carriers of *Schistosoma* or by the destructive talents of the ship worms and fouling molluscs. This, in a way, but adds to the importance of their study; it does not diminish the positive qualities of the group. Though the recognition of their full potential, including their role as nutritious, even delectable, food is of relatively recent date, it is clear that man has exploited the shell resources to varying extents ever since he started utilizing nature's gifts for his own personal or social needs.

In India the molluscs have occupied a marked place in the affairs of man from time immemorial, in his affairs of state and economy, of mind and aesthetic values, of religion and rites of worship. From their pride of place in mythology and legend they have inspired countless tales in folklore, caused long-standing customs and traditions, and in more recent times come to occupy prominent positions in heraldry and royal insignia, besides featuring conspicuously in the economy of vast sections of the people.

The most renowned of these molluscs, in lore and in literature, is perhaps the pearl oyster, as the very mention of the fabulous pearls strikes a responsive chord rich in associations. History and legend here bring forth such an admixture of fact and fiction, wherein for some historical pearl or other, kingdoms have fallen, fortunes changed hands or widespread destruction has followed. The pearls have also inspired countless ancient poets to moralise and gush forth lyrical, even if unscientific, accounts of their origin and occurrence.

MOLLUSCS IN ANCIENT INDIA

Evidence of long-standing association between man and molluscs in India is afforded by the shell remains discovered in human habitations of pre-Vedic Mohanjedaro, Harappa, Amri, Nal, Nundara and Rupar. These included not only the cowries (*Cypraea*) and the Chank (*Xancus*) but also their products—bangles and cores of shells from which the bangles have been sawn out. In Vedic times, despite the relative rarity of references to marine life in the Vedas, possibly because of the predominantly agricultural or pastoral nature of Vedic civilization which had very little contact with the sea, the few references that occur relate mainly to the molluscs—the *sankha* (Chank), *sukti* (pearl oyster), *sambuka*, *valluka* and *vodika* (generally held to be spiral-shelled gastropods).

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But to know the hold of the molluscs over ancient Indian mind, one has to start from the dim ages of mythology and legend.

(*a*) *In mythology*

The sacred chank, for instance, is so much a symbol of Hindu worship and mythology that it is integrated with almost every aspect of early Indian thought and culture. Vishnu, in his original aspect, has it as one of his four emblems; some of his avatars too are depicted as holding it. Possibly from this close affinity the chank is used in all Hindu temples, irrespective of sects, as an indispensible instrument of worship, as a container for holy water, as an instrument of invocation and call to the devout for worship. The mystic wail of the sacred chank resonant in the fading twilight of day-break or dusk is part of the spiritual aura that surrounds most Hindu temples. Particularly the sinistral chank, by its very rarity, is held in such esteem that all major temples in India have one or more of these.

Such adoration does not appear to be confined to the chank alone, nor to Hinduism alone. The fossil cephalopod *Ammonites* of the sub-Himalayan region, known to the Vaishnavite devout as *salagram*, is held in high veneration as the very abode of Vishnu. And the Buddhist monasteries in Tibet have been known to keep sinistral chanks; the one at the Sakya Monastery, for instance, is believed to have been gifted by the great Kublai Khan himself in late 13th century. In some of the neighbouring countries of India too these shells are preserved as priceless treasures, at some time their value having been assessed at their weight in gold!

(*b*) *In folklore and superstition*

From its intimate association with the religious and emotional life of the people, the chank gradually slid into man's diverse walks of life. The folklore of different parts of India is replete with tales that have found concrete expression in many social customs as well. The lore relating to the place of chank and chank products in the marriage rites is vast, particularly in Bengal where the wearing of a lacquered chank bangle is part of the traditional ceremony. There is evidence to show that similar customs were prevalent elsewhere too, though non-existent now. Anthropologists refer to agricultural and pastoral communities like the Vellalans and Idaiyans, where the married women wear chank bangles customarily. The lore sometimes links the shell to Shiva who, as the story goes, laughingly chided Parvati at the time of her wedding, as not as charming as she might be, and proceeded to create out of his braided hair a Being who brought chank bangles for the adornment of the bride. Or, as in the story from South India, it is linked with Sri Krishna who, after abducting Rukmini from her marriage with Sishupala, married her himself by placing a chank bangle on her wrist.

The influence that the shells exerted on the imagination of the ancient world is also borne out by the wealth of proverbs about the shells in different Indian languages.

From religion and folklore it is but a short step to superstition and the shell pervades the superstitious world just as extensively. From innocent, amusing beliefs, such as that sinistral shells blow of their own accord during the nights (a superstition once so entrenched in Tamil areas that even Christian divers felt concerned at this!) to stories of their power to ward off evil, all sorts of superstition have been reported. Tattooing or branding with heated metal the form of a chank, or burying a chank beneath the first stone laid for the construction of a temple or a house, all were once considered purificatory acts to ward off evil omens.

(*c*) *In social customs and traditions*

Apart from the uses already mentioned as inspired by folktales and superstitions, shells as traditional personal adornment were in use among many communities. It is quite possible that these were originally worn as amulets or mascots tied round the neck, but their form and use

acquired a range in later years from finger rings and necklaces to disc ornaments for hair or head dresses. Rings cut out from *Stombus* shells were used either as finger rings or strung on a cord and interspersed with coral beads as necklaces. Necklaces were also made with discs cut out of shells or from bisected shells merely strung together. The wearing of these necklaces once a girl had attained a particular age was an obligatory custom in many tribes in the past. The shell discs as ornaments for the ear or as decoration for head-dresses appear to have been popular till recent times among peoples of the northern border—the Bhutanese, the Assamese and the Nagas.

Other shells used as ornaments included the ring-cowry *Ornamentaria*. This cowry and also the money-cowry *Monetaria* were considered a symbol of wealth and prosperity and found a place in many social functions like marriages, rice-giving ceremonies, *sradaha* (death anniversaries), etc. Sometimes cowries or chanks were placed with the dead body as part of funereal rites.

The cowries were also widely used in gambling and many other indoor games.

(*d*) *In trade and handicrafts*

Ancient Indians rarely left any records of their commerce or trade, when foreign sources have often filled in much information. As one leaves the dim past of myths and legends and comes into years of early history, indications of the commercial importance of molluscs are forthcoming. The accounts of foreign travellers mention the brisk trade that went on in shells from the fishing grounds of the Gulf of Mannar and Kathiawar coasts. The chank bangle trade is referred to in ancient Tamil writings and its prevalence proved by archaeological evidence. The travelling monk Cosmas Indico-Pleustes in the 6th century referred to the export of conch shells from India. The disputes and rivalries that went on between the foreign powers on this score, particularly at the time of the Portugese and the Dutch, are part of more recent history. Rings, bangles plainly or elaborately carved, and disc ornaments appear to have been the main handicraft products of the past.

The "ink" extracted from the cuttle fish *Sepia* was used as a drawing ink till recently and was known to keep the clarity and intensity of colour for long. Similarly the "purple" extracts from some gastropods were also used as dyes and pigments.

(*e*) *As currency*

The shells, particularly the cowries, constituted the currency among many civilized and uncivilized peoples of the world. The most commonly used were the money-cowries *Monetaria*. Some ancient Hindu treatises about the 5th century mention the use of cowries as currency. Because of similar use of cowries in many parts of Africa, the trade in cowries flourished. There are records of annual despatch of cargoes of cowries fished from Laccadive-Maldive waters to Wydah and Lagos, where they were exchanged for Spanish doubloons brought by the slave traders. Many European nations also imported cowries from India and other places for payment to West Africans in exchange for their products. Marco Polo, in the account of his voyage to China, recorded the finding of cowries circulating as currency in Yunnan in the 13th century.

Many Indian hill tribes, including the Nagas, employed it almost until the appearance of the Rupee. Till about a century ago the shells appear to have had a fixed and well-worked-out exchange value among the Nagas. Slaves and cattle were traded in shells. The villages captured during raids paid their ransom in shells as well as in other kind.

(*f*) *As medicine*

Many molluscs, predominantly the chank, appear to have been extensively used medicinally in ancient India. Chank shells, powdered and mixed with water, was considered an effective salve for ailments ranging from skin diseases to rickets and asthma. Chank ointment was similarly held

as cure for eye inflammation or granulation on inner side of eyelids, for piles or even for leprosy. Sometimes chank powder was prescribed, mixed with ghee and taken internally, for skin troubles, consumption and such. Another remedy compounded of partially burnt camphor, chank powder and human milk or white of egg was considered a speedy cure for soreness of eyes. The chank powder was, in short, a panacea for diverse illnesses like jaundice, cough, phthisis and general debility. The dried egg capsule of chank, powdered with pepper and coriander in til oil, was considered effective to relieve headache, while the dried visceral mass was thought efficacious for enlarged spleen.

Some of the remedies appear scientifically possible of explanation. The use of chank powder as remedy for dyspepsia seems based on the carbonate of lime counteracting the hyperacidity of gastric fluids. Similar may be the case of rickets—an illness characterized by insufficient deposition of lime in bones. In many cases, however, it may be the religious association of the chank and the consequent faith in it that proved responsible for many cures.

Other molluscs that were put to medicinal uses included the cowries (*Cypraea*), the apple snails (*Pila*) and the widowpane oysters (*Placenta*).

Molluscs in Modern India

The molluscs in India are playing a living role yet, shedding many of their past associations and reported miraculous properties (the impact, no doubt, of the so-called ungodly present-day generations!) but assuming newer and vastly more utilitarian roles.

(*a*) *Surviving customs and traditions*

However, traditions and habits die hard and superstitions assume modern garb and survive, if only in name. Chanks or other shells tied to the forehead of draft bullocks or around the neck of cows and cow-buffaloes to keep them in milk are still sights not very uncommon. True, they are often put on as mere ornamentation now, their owners having no idea of the origin of this practice. Such is also the case of the shell necklaces that continue to be worn by many tribes even today. The mark of sophistication is not altogether absent, either—the shells that were once used to cut out discs for the ears and the hair, now turn out dress buttons.

Even the role of the conch as a clarion call to duty and action, exemplified in ancient days in times of war (when every great warrior had his own individual and renowed conch which he blew lustily while going into action)—even this role appears to have survived in the custom in Bengal of blowing the conches in times of emergencies such as eclipses or earthquakes. The resounding booms proceeding from almost all houses in a locality is kept up until the calamity is over (or, may be, until the deafened neighbourhood is past caring!).

(*b*) *In heraldry and design*

The nobler, more elevated roles of the shells also have survived in part. Apart from the continued use of the chanks in Hindu temples, the heraldic designs of the royal houses as well as the State emblems of both Travancore and Cochin had the sinistral chank as a prominent motif. Perhaps reminiscent of the early use of shells as currency, the chank shell was a symbol on coins issued by many ancient rulers, especially of the Pandyan and Chalukyan dynasties. In more recent times Travancore and Cochin again used them on coins and early stamps. What is perhaps significant here is that in these cases the chank symbol was often used in place of and to the exclusion of the sovereign's head. What higher status can one ascribe to these shells?

(*c*) *In trade and handicraft*

The trade in shells as raw material for the traditional handicraft products appears to have fallen, with glass and plastics displacing the chank in the bangle and bead-necklace manufacture, to a

large extent. The chank bangle industry, however, still survives in Bengal. New forms of handicrafts have evolved in place of old. The old-world infant's drinking-spout fashioned out of chank lingers among some of the poorer classes, while the richer strata are supplied with carved shell ash-trays or *Nautilus* reading lamps or window-pane oyster lamp shades. A glue made out of the powdered horny operculum of the chank is still in use in some places as an adhesive base in the manufacture of incense sticks.

(*d*) *Fisheries*

Apart from the well-established fisheries for the pearl oyster and the chank along the Gulf of Mannar and Kathiawar coasts many clams, mussels, squids and other minor shell-fishes constitute smaller fisheries of local importance in many other regions as well.

(i) *Pearl oyster.*—The fishing grounds for the pearl oyster (*Pinctada fucata*) are in the Gulf of Mannar on the east coast. The inshore areas here afford a suitable habitat for the growth of oysters. The oyster beds are dispersed on patches of rocky sea-bottom (called *paars*) 8–12 miles from the shore at depths of 7–12 fathoms.

The pearl fishery, though well known since ancient days, was neglected for a considerable part of the first half of this century. But the operations were revived in 1955, after a lapse of nearly three decades, and for successive years up to 1961 yielded lucrative fisheries.

A pearl oyster fishery in the Palk Bay off Tondi was held in the early second decade of this century. In the Gulf of Kutch off Jamnagar and nearby places pearl fisheries of very small magnitude are annually harvested, the oysters exposed on rocky reefs at low tides being hand-picked by fishermen.

(ii) *Chank.*—The chank (*Xancus pyrum*) is peculiar to the waters of India (and Ceylon) and the Andamans, its nearest relatives being found only in Brazilian waters. Among the distinct traditional fisheries for the chank (Tirunelveli-Ramanathapuram, South Arcot-Tanjore, Kanyakumari-Trivandrum and Kathiawar) only the fishery in the Gulf of Mannar and Palk Bay is well organized and carried on systematically. The chank beds off Kathiawar coasts are probably next in importance. As in the case of the pearl oysters here, at Okhamandel, the chanks are not dived for, but are collected at spring tides when extensive littoral areas are uncovered.

The Tirunelveli-Ramanathapuram chanks have been noted for their solidity, weight and hardness. The chank beds lie in fine sandy areas (called *pirals*) interspersed with the rocky pearl oyster beds in the Gulf of Mannar and also extend further into the Palk Bay. The Tirunelveli-Ramnad chanks now constitute the bulk of the production that meets the demand of the Bengal chank-bangle industry.

(iii) *Mussels and clams.*—These form regular fisheries of considerable local importance along the east and west coasts. The meat is widely eaten, even considered delicious by those who develop a taste for it. The brown and green mussels (*Mytilus* spp.) form particularly good fisheries in Kerala, the former occurring in patchy but extensive beds from Kovalam to the Cape, while the latter is abundant in the northern districts. There are similar fisheries in many other States for edible bivalves like the weaving mussel (*Modiolus* sp.) wedge clams (*Donax* spp.), the backwater clams (*Meretrix* spp.) and backwater oysters (*Ostrea* spp.).

(iv) *Squids and miscellaneous shellfishes.*—Besides the above-mentioned, many widely distributed fisheries such as for the squids, edible gastropods and the like are existent. The most important of these is the fishery for the squid (*Sepioteuthis*) centred along the coast of Ramanathapuram District, where large shoals appear in April–July. They are consumed locally or, in times of poor demand, sun-dried and sold in the interior.

The cuttlefishes (*Sepia*) do not form any regular fishery in these areas, but are taken occasionally in cast nets or shore seines. Though they are eaten, it is the cuttle-bone that is more important

commercially. These bones are washed ashore in large numbers and are gathered for sale. A considerable quantity of cuttle-bones is sold from Kerala too. The demand for cuttle-bone from abroad adds to the value of this trade.

Among the miscellaneous molluscs serving as food may be mentioned the edible whelks (*Pellia*) consumed by the poorer classes along the Konkan coasts, the olives (*Oliva* spp.) extensively used as food by certain sections of fishermen on the Coromandel coast and the common apple-snail (*Pila*) which is eaten and also used medicinally.

The window-pane oyster (*Placenta*), though not edible, is important commercially and a small industry for this exists in the Gulf of Kutch. The shells, transluscent and mica-like, are raw material for many handicraft products, and the animals produce an abundance of seed pearls which are not valuable as jewellery but are held to have medicinal properties.

Besides their use as food, many of these shellfishes mentioned earlier, particularly the squids and to a lesser extent mussels and clams, are in great demand as fish baits.

The fishery for *Trochus* and *Turbo* in the Andaman and Nicobar islands is of importance because of the commercial demand for "mother of pearl" in the manufacture of shell buttons, buckles and other artistic fancy goods. This fishery, like those of the pearl oyster and the chank, is under State control and the beds situated on rocky ledges at 8–10 fathoms are leased out for exploitation. As in the case of the chank, however, the industry for "mother of pearl" has also been affected by the recent introduction of plastics and synthetic materials.

(*e*) *In industry*

The shells are used in modern industry primarily for the manufacture of lime and cement. Especially in this country where in the mortar used in building construction as well as in the white-wash needed for its maintenance lime is an essential commodity, the industry though scattered and so individually on a small scale, is cumulatively a large one. Though mussel and clam shells are usually used for preparing lime, chanks are used for special needs and occasions, as the lime produced by the chank shell is found to be of superior quality. Similarly, though carbonate deposits are widely used in the manufacture of cement, the factory at Kottayam in Central Kerala makes use of the dead and subfossil shells from the Vembanad Lake as their chief raw material.

(*f*) *As enemy of man*

This account has so far dealt with some of the useful or at any rate harmless aspects of molluscs in their relationship with man. There is a reverse side to this too. The molluscs can also be agents of large-scale destruction or dreaded carriers of death to livestock or to man himself.

They cause destruction to property by fouling or by boring. Many bivalves, particularly of the oyster and mussel group, are chief components of fouling communities that encrust submerged objects like piles and boats, causing considerable loss of timber or in case of vessels, reducing their speed and spoiling their streamlined efficiency in water. The wood-borers (like *Bankia*, *Teredo*, *Martesia*, etc.) or ship-worms, even as their latter popular name suggests, eat away submerged timber and cause extensive damage to wooden hulls of sea-going vessels. These molluscs thus have a significant place in the economy of a maritime people.

The importance of molluscs as a hazard to health stems from their close association with many helminth parasites. The well-known Schistosomiasis (Bilharziasis) or snail fever is spread through the agency of amphibian or freshwater snails that are intermediate hosts to these parasites. This dreaded disease is rampant in Africa, Middle East, South-East Asia and tropical South America. But India has so far been free from it though allied helminth species have been recorded from many common freshwater snails, like *Lymnea* and *Indoplanorbis*. These snails are also active in the spread of many serious trematode infections in livestock.

Present Resources—Need for Survey and Utilization

As mentioned earlier the resources of molluscs that can sustain regular and very productive fisheries are abundant in our waters. The primary need is to survey these resources and gather data on the existing level of their exploitation—which is bound to be low. Only the pearl oyster and chank fishing grounds had received some early attention in this regard, and even here a recent co-operative underwater survey conducted by the Central Marine Fisheries Research Institute and the Madras Fisheries Department with the aid of aqualung or SCUBA diving revealed many changes in patterns from that recorded by earlier surveys done decades ago, and also indicated fresh grounds that could be exploited commercially. Such systematically carried out surveys and preliminary studies should be made for other resources as well.

Great as the industrial use of molluscs is, perhaps the significance of molluscs in future would be greater as a potential source for human consumption. Only a few of the mussels, clams and oysters are now generally eaten and even these are more a poor man's food and have not attained their place on the gourmet's table that they could. The need for popularising molluscs as food is great, particularly in a country like ours where provision of nutritious food is a long-standing problem and any means to tackle it should be tried and, if successful, popularized. From the nutritional point of view the molluscs have many advantages such as easy digestibility coupled with high contents of minerals and vitamins. They have approximately 8–10% of proteins (by weight), 4–5% of carbohydrates, 2–3% of minerals with but 1–2% of fat. It has been calculated that a good serving of oysters, for example, would supply more than the needed daily allowance of iron and copper, about half the required amount of iodine, about one-tenth the daily need of protein, calcium, phosphorus, vitamin A, thiamine, riboflavin and nicotinic acid. Thus the role that the molluscs can play, along with fishes, in meeting the country's quest for balanced, nutritious diet has to be more widely recognized.