

The Conch Horn

**Shell Trumpets of the World
from Prehistory to Today**



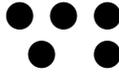
Jeremy Montagu

Jeremy Montagu

The Conch Horn

© Jeremy Montagu 2018

The author's moral rights have been asserted



**Hataf Segol
Publications
2018**

Typeset in X_YL^AT_EX by Simon Montagu

The Conch Horn

Shell Trumpets of the World
from Prehistory to Today

Jeremy Montagu

Contents

Illustrations	vii
Introduction	1
1 The Conch in Europe and around the Mediterranean	9
2 The Conch in Africa and Nearby	43
3 The Conch in the Indian Sub-Continent	53
4 The Conch in South-East Asia and the Orient	75
5 Oceania – The Islands of the Pacific	101
6 The Americas	149
Bibliography	191
General Index	203

Illustrations

Fig. 1-1	A modern example of <i>Charonia nodifera</i> (Lamarck) from Catalunya, in Spain, Montagu Collection, XI 280.	11
Fig. 1-2	Reed-blown foghorn, c. 1930s, Montagu Collection, I 142b.	36
Fig. 2-1	<i>Bursa</i> shell from Tanzania, East Africa, Montagu Collection, IV 102.	48
Fig. 3-1	Small Indian <i>chank</i> , Montagu Collection, VI 38.	54
Fig. 3-2	Another small <i>chank</i> from the Tibetan borders, with parts of the body encased in silver and covered with semi-precious stone, Montagu Collection, XIII 242.	62
Fig. 3-3	Tibetan <i>dung-dkar</i> or <i>Rag Gshong Ma</i> , with added silver mouthpiece, bell flange, tail, and other decoration. Photo Aurelia Hartenberg Collection, used by her kind permission.	64
Fig. 3-4	Two <i>chanks</i> , India, Montagu Collection, III 70a/b.	67

Fig. 3-5	<i>Turbo marmoratus</i> shell, Bhima's conch Paundra, Montagu Collection, I 10a.	70
Fig. 3-6	<i>Trochus niloticus</i> shell, Sahadeva's conch Manipushpaka, Montagu Collection, X 260.	72
Fig. 4-1	Pottery conch of the 12th century, Khmer culture of Kampuchea, Montagu Collection, XIII 220.	78
Fig. 4-2	MRI scan of the same shell, showing the internal blockage.	80
Fig. 4-3	A young Naxi dongba, He Xiudong, blowing the conch during the 2007 Smithsonian Folklife Festival. Photo with kind permission by Helen Rees.	87
Fig. 4-4	Japanese <i>horagai</i> , Montagu Collection, XI 44, missing its open-mesh network of silk cord.	92
Fig. 5-1	Map of Oceania. Kindly made available for public use by Kahuroa.	102
Fig. 5-2	Side-blown wooden trumpet, from the Blackwater River area of Papua New Guinea, a conch substitute. Montagu Collection, IX 210.	111
Fig. 5-3	End-blown bamboo trumpet, Asmat People, Southern Papua, Indonesia, a conch substitute. Montagu Collection, V 4.	112

Fig. 5-4	Side-blown <i>Syrinx aruanus</i> Linnæus shell from Papua New Guinea. Montagu Collection, XI 24.	113
Fig. 5-5	Side-blown conch, <i>Charonia tritonis</i> (Linnæus), from the Trobriand Islands of Papua New Guinea. Montagu Collection, IX 212.	119
Fig. 5-6	End blown <i>Tutufa bursa</i> shell with a fingerhole in parietal wall, Fijian style. Montagu Collection, I 8a.	127
Fig. 5-7	Side-blown <i>Cassis cornuta</i> shell used by Alfred Snelling to call people to church at Anapauo on Fefan Island in the Carolines. Photo courtesy Nancy Thym, his great-niece.	133
Fig. 5-8	Side-blown <i>Charonia tritonis</i> shell from the Marquesas Islands, with two blowing holes, one filled with wax. Montagu Collection, III 68.	140
Fig. 5-9	End-blown <i>Charonia lampas rubicunda</i> shell with added wooden mouthpiece and tassel of pukeko feathers, Māori, New Zealand. Aurelia Hartenberger Collection, used by her kind permission.	144
Fig. 6-1	End-blown <i>Lobatus gigas</i> (Linnæus) shell, used to call farm hands in for meals near Belle Plaine, Iowa. Montagu Collection, V 76.	154

Fig. 6-2	Pottery skeuomorph of a <i>Lobatus gigas</i> shell, México, modern. Montagu Collection, X 272.	165
Fig. 6-3	Pottery skeuomorph of a <i>Malea ringens</i> conch, Mochica people, Peru. Montagu Collection, XI 122.	172
Fig. 6-4	Scan of the interior of the same shell.	173
Fig. 6-5	Two modern pottery conchs by John Taylor, London, 1991. Montagu Collection, XI 18a and b.	175
Fig. 6-6	Two Inca conchs, <i>Malea Ringens</i> and <i>Lobatus galeatus</i> . Aurelia Hartenberger Collection, used by her kind permission.	179
Fig. 6-7	<i>Cassis tuberosa</i> (L), a fisherman's horn from Barbados. Montagu Collection, I 18a.	186

Acknowledgments

I have many people to thank, especially those who have permitted me to use examples of their fieldwork, who have referred me to their published works, often providing me with offprints or other copies, who have suggested other people to whom I should write, who have sent me photographs of different shells, and who have permitted me to use photographs of shells from their collections.

The first in time is Peter Dance, who some fifty years ago, when I was working part-time for Bernard Fagg at the Pitt Rivers Museum, came and identified the species of all the shells in that collection, giving me the basics on which I have worked ever since – any errors in that respect in this book are my fault, not his! The next in that respect are the curators of the many museums in which I have examined, and often was permitted to blow, their shells, or who sent me photographs of examples. Many of their names I have regrettably forgotten or failed to note from the early 1960s onwards, but Karl Gustav Izikowitz and Karl Erik Larsson of Göteborg Etnografiska Museet stand out in my memory for the unrivalled access to that collection that I was given.

Those who have so kindly spent their time in helping with the research for this book are, in order of appearance in this book, as they say, when announcing the cast of an opera on the radio: Peter Holmes, Emiliano Li Castro, David S. Reese

(who sent me copies of many of his relevant publications), Sergio Bonanzinga (who also sent me copies of his publications), Judith Cohen, Sir Kenneth Oakley, Batya Bayer, Percival Kirby, Roger Blench, Edmund Herzig, Aurelia Hartenberger (who has been generous with permission to use photographs of her shells and went to much trouble to take them and to provide details), Lars-Christian Koch, Nazir Jairazbhoy, Dalaimergeren Tosontsengel, Dawn Rooney, Uwe Pätzold, Helen Rees (who also kindly provided a photograph), William Waterhouse, Mr. Miyamoto, William Malm, Andrew McGraw, Margaret Kartomi, Patricia Matusky Yamaguchi, Vincent Megaw, Brian Diettrich, Stephen Wild, Don Niles, J. F. Peake, Raymond Clausen, Raymond Ammann, Karl Erik Larsson, Nancy Thym (who went to much trouble to try to find details of her great-uncle's use of his shell and to photograph it), Richard Moyle, Arnd Adje Both and his wife Olga Sutkowska, Aviad Montagu, Stephen Goss, Steven Turnbull, and John Taylor.

Penultimately I must thank Jeffrey Nussbaum of the Historic Brass Society who, over a meal in Rome in 2015, suggested that I should write this book.

And finally I thank my son Simon who has had the skill and who has taken the time and trouble to publish this book for me on my website. And I must also thank my grand-daughter Kate Roseman for all her care in taking all the photographs of my shells.

Introduction

The Conch can claim to be one of humanity's first trumpets or horns, perhaps indeed the first, for one has been found in one of France's caves from the Upper Palaeolithic period, dating back some 20,000 years. Blowing shells are found all around the world, roughly between the 35th parallels north and south of the equator, with some exceptions both south and north. In this book, we shall survey that belt from one continent to the next, beginning with Europe simply because that is where we have the oldest examples, and proceeding eastwards until finally we reach the Americas, ending with the waters of the Caribbean seas.

The word 'conch' means shell and derives from the Greek *konchē* or *konchos*, and Sanskrit *čankha*, and thus the commonly used term 'conch-shell' is a tautology. There is a huge variety of shells around the world of many different shapes, and each is the external skeleton, and simultaneously the home, of an animal, for our purposes a marine one. Of all the world's shells, excluding the bivalves (clams, scallops, mussels, oysters, etc), the cephalopods (nautilus, cuttlefish, etc) and others, only one type concerns us here, that of the gastropods. These are those

creatures that walk, using their stomachs as a foot, as the name implies, while carrying their helical shells on their backs, such as our garden snails. Of those that can become trumpets, only the larger varieties will serve. Small ones from land or sea can be used as whistles, and often are, but all of those large enough for trumpeting come from the seas.

I use the word ‘helical’ rather than ‘spiral’ because a helix (Greek for a snail) is a form of spiral that expands in diameter from the narrow tip at the top to a wide opening at the bottom, whereas ‘spiral’ has connotations such as a spiral staircase, which is the same diameter all the way up (or down) with parallel sides, and shells are not like that – they all widen as they go and as the creature grows.

Those large conchs that can become trumpets prefer warmer waters to colder and therefore they seem to thrive in the central belt of the world’s circumference, but not all the peoples that live within this belt seem to have used them for blowing, as we shall see, whereas others, to the north and south, through trade or other means, do also use them.

The easiest way for a conch to be blowable is for the player to find a dead one on the beach. These are what conchologists (those who study shells) call fossil conchs even though they are not fossils in the normal sense of that word. They are those whose inhabitants have died and whose soft parts have been eaten by scavengers or have simply decayed away, leaving just the skeleton that we call the shell. Having found one, the next

step is either to knock off the top of the spiral at a point that provides an aperture of a size suitable for the lips to blow it as a horn, neither too wide nor too narrow, or else to knock or drill a hole of the right diameter in the side of one of the upper whorls near the narrow end. Which of these that one does will depend upon cultural preference. Most trumpeting conchs around the world are end-blown, but side-blowing is common in the Pacific islands of Oceania and in parts of East Africa. It will also depend somewhat on the species of the shell, for some are so tightly coiled at the narrow end, or are so knobby on the sides, that to make a side-embouchure would be difficult, or even impossible.

An alternative procedure is to fish up a live conch, extract the inhabitant and clean out the shell, and then proceed as above. The advantage of this method is that the inhabitant is edible and is regarded in many places as a delicacy, just as are the land snails that we eat as *escargots*, and whose shells can be used as whistles. Many shells in shops are simply by-products of the food trade, and this popularity as food has led to such over-fishing, risking extermination, that some are now on the CITES list of protected species.

Because a conch is a tightly coiled helix, its interior forms a tube of expanding bore. It is not easy to establish the length of the tube: imagine a spiral staircase – is its height that of the column up the centre or is it the distance that your hand travels on the outer wall or on the railing as you ascend or descend?

The two are very different. That staircase is a cylindrical tube, but the conch is an expanding tube so that the distance that your hand would travel on the outer wall would be far greater.

The most practicable way to establish that length is simply to blow the conch, measure its pitch, and then to compare that pitch with the known lengths of our orchestral instruments, and this is what has been done throughout this book. This method would be forbidden in most museums today, but I am free to do it with my own conchs, and museums were not so fussy about such things back in the 1950s and '60s when I first started researching these and other instruments. The actual lengths are not really relevant, so the pitches of all those here that have been blown are given with the normal notation of such instruments, with c' as middle C and from there upwards in pitch to the b' , and the next C in the second space down on the treble stave as c'' ; and the octave below middle C from c to b as plain letters. Cents are hundredths of an equal-tempered semitone, and they are our tool for the precise measurement of pitches, just as millimeters are for measuring lengths, and so $c'+30$ cents would indicate about a third of a semitone sharper than middle C.

If the basic pitch (the fundamental in musical terms), is about an octave above the fundamental of our orchestral B-flat trumpet, which is around four foot six inches long, then the tube length of a conch must be about half that, around two foot three inches long. As this is a fairly typical pitch, with several of mine sounding between the G above middle C and the A below, we

can say that the tube length of a blowing conch is most commonly somewhere around 30 inches long, the longer ones the approximate equivalent of a posthorn and, once one has accustomed oneself to the lack of a posthorn's mouthpiece, no more difficult to sound. In some areas of Europe some conchs have a cornet-style mouthpiece attached to the end, and elsewhere other types of mouthpiece are added, usually plain cylindrical tubes without internal shaping, most commonly luted on with wax. Most conchs are blown as one-note instruments in their home contexts, though that one note can be varied to a limited extent by means that we shall discuss in the relevant geographical areas below, particularly in Chapter 5 (Oceania). Others can produce at least two or three pitches, a fundamental, an octave above, and a fifth above that (which would thus be the first, second, and third partials), and whether this is done or not will, once again, depend on cultural preference. The range can be considerably greater in skilled hands, but this is more normally heard among our experimental musicians than it is in the areas to which conchs are native. Such experimental use is beyond the scope of this book, chiefly because of my ignorance in that area, but I gather that there are various groups and ensembles using conchs in that way.

Regarding the other details of measurements here, the overall length (OL), overall width (OW) and overall height (OH) are measurements taken with the bell downwards, flat on the bench. The overall width is normally listed as c. (=approximately) be-

cause the widest points of a conch are seldom opposite each other, and therefore it is difficult to be precise when measuring them. The embouchure diameter (emb \emptyset) may, if it is very irregular, have more than one dimension. All these measurements are given in millimeters, as is customary for scientific measurements.

I have wherever possible noted the different species of shells, either from information given or from visual recognition. Two useful books for this purpose are S. Peter Dance's *Shells: an Eyewitness Handbook* (London Dorling Kindersley, 1992) and Abbott R. Tucker & S. Peter Dance, 1982, *Compendium of Seashells, A full color guide to more than 4,200 of the World's Marine shells* (New York: E.P. Dutton, 1982). Because references frequently differ in nomenclature of species, I have tried, so far as possible via Wikipedia and such sources, to use whatever may seem to be most currently acceptable name, while also giving what may be a better-known, because older, name, sometimes with 'aka' (also-known-as).

One point that must be emphasized in a book of this nature is that information can only be provided whence information is available, whether from books and articles, or information from kind colleagues. We have very detailed information on ancient and modern use of conchs in Italy, whereas we have less as yet from Spain, for example, and we also have much on the Mediterranean islands, but none for the southern shores of that sea. We have some information for the eastern coast of Africa,

but none for the western shores. We have a great deal for India, but less for China. We have a fair amount for some of the Pacific islands of Oceania, and none at all for others. This should not necessarily be taken to indicate the lack of uses for the conch in those areas, but simply that work on them has not been done in some places, or has not been accessibly published.

It is probably easier to proceed now by geographical areas than it is by species of shell, partly because that will allow us to detail the history and use of the conch in each area, and partly because while in some areas a large variety of shells is used, in others only a few appear, often only one or sometimes two.

The Conch in Europe and around the Mediterranean

We begin here because, while there are ancient traditions in many parts of the world, it is in Europe and the neighbouring areas that we have more secure datings and earlier archaeological evidence than for anywhere else. This is not to suggest that the conch might be earlier in use in Europe and its environs than elsewhere; the reason is that it was here in Europe, in the eighteenth and nineteenth centuries, that archaeology began.

The use of the conch for purposes of ritual, signalling, and music is of unknown antiquity. Certainly it must have formed one of the earliest types of trumpet for those within reach of a sea-coast, for as we said in the Introduction, to knock off the spire or make a hole in the side of an empty shell is an easy operation, much easier, in fact, than cutting off the solid end of an animal horn or boring into its side with a piece of flint. Indeed, shells often wash up on the beach already in such condition, so that all that is needed is to wash the sand out, empty out the water and, while blowing out the last few drops, to produce a sound, whether intentionally or accidentally – blowing out the

last drops with a spitting ‘pft’ could easily result in an unintentional sound.

The oldest conch that I have heard of comes from the Magdalenian Period of the Upper Palaeolithic, from around 17,000 years BP (Before the Present). It was found in the Marsoulas cave, one of the many painted caves in the Haute-Garonne area of southern France, and it is an end-blown *Charonia nodifera* (Lamarck) shell, the Mediterranean species. The distance between that cave and the nearest point of the Mediterranean is around 170 km (just over 100 miles). Its size is listed by the Muséum de Toulouse, where it resides, as 31×18×18 cm (catalogue no. MHNT.PRE.2010.0.1.2). To bring a shell so far into the middle of southern France indicates the importance that it must have held for the people of that community. It is accepted by most authorities today that sound was exploited in these caves: bull-roarers have been found there, there is evidence that the stalactites in these caves were used as lithophones, and it has been shown that the caves themselves resonated the sound of such instruments and voices.¹

I have not heard, as yet, of any shells from the Mesolithic period, which follows that of the Upper Palaeolithic, but we do have a great many conchs from the European Neolithic, the ar-

¹The information is summarised in my *Origins and Development of Musical Instruments* (Lanham, MD: Scarecrow Press, 2007), 6–7.



Figure 1-1: A modern example of *Charonia nodifera* (Lamarck) from Catalunya, in Spain, Montagu Collection, XI 280.

chaeological period which comes next, and from then on the history is continuous, if somewhat spasmodic.

As one might expect, our earliest evidence centres on the Mediterranean area, for that sea is at around the northern limits of the larger conch species, and therefore the main Mediterranean species, *Charonia nodifera* (Lamarck), also known as *Charonia lampas* (Linnæus), is by far the most common (fig. 1-1). Two other species, large enough for blowing, also inhabit the Mediterranean, the *Charonia variegata* (Lam.), aka

Charonia sequenzae (Aradas & Benoit), a shell that is much smoother than *C. nodifera*, which (*C. nodifera*) has large protruding knobs or nodes as its name indicates, and also the *Cy-matium parthenopium* (von Salis), a rougher and more compact species that we shall meet later, and which seems to have a worldwide habitat.

Why the genus of the first two of these shells was named for Charon, who ferried dead souls across the River Styx to Hades in Greek legend, I do not know, but perhaps in legend he signalled his arrival with a conch – certainly Gluck gave him one in his opera *Alceste*, in the aria ‘Caron t’appelle’;² we shall see another possible link further on this chapter. Nor is it known why it was the Pacific shell, *Charonia tritonis* (L.),³ rather than the Mediterranean shell, that won the name of Triton. The Tritons were half-men and half-fish sea godlings, the sons and heralds of the Greek sea god Poseidon, whom the Romans called Neptune, and who blew his conch to stir or calm the waves. Tritons in general were also associated with Venus and, as we shall see later, this may also have been important in some more modern Italian uses. Perhaps it was simply that a Pacific shell came first to Linnæus’s table while he was classifying these shells, and so it was that shell that won the species title of Triton, and perhaps

²Hector Berlioz, *Traité d’Instrumentation et d’Orchestration* (Paris: Henri Lemoine, Nouvelle Édition, 1855; repr. Farnborough: Gregg Press, 1970), 183.

³L. stands for Linnæus, and Lam. is the abbreviation for Lamarck.

it was only later that he observed that the Mediterranean shell, which the Greek Tritons would have used, was of a different species, even if of the same genus. But of course all this Greek and Latin connection is far later than our early examples from the Palaeo- and Neolithic times.

One conch that dates to the overlap between the Mesolithic and the Neolithic, from around 5500–4500 BCE, is listed by Robin Skeates quite a long way from the Mediterranean, in Lower Saxony, at Ösel, near Wolfenbüttel in central Germany.⁴ The shell, a *Triton*, but whether *C. nodifera* or *C. variegata* is not stated, was found deeply buried, lying on the bedrock, at the bottom of a pit, at the top of the Ösel hill. The shell was filled with, and surrounded by, 19 worked flints from the early Neolithic period, a deposit that very strongly suggests a sacrifice to the gods.

This is followed in date in Skeates's paper by many examples of *C. nodifera* shells from the Neolithic period that have been found in caves in Italy, mostly in burial sites. Many of them were in Liguria, the stretch of coastline on the northern shore of the Mediterranean that forms the border between Italy and Monaco, with Genoa as its centre. In one cave, the Caverna della Pollera, five shells were found, each with its apex removed so that it could have been blown, and each with a small hole

⁴Robin Skeates, 'Triton's Trumpet: a Neolithic Symbol in Italy', *Oxford Journal of Archaeology* 10:1 (1991): 17–31.

in its lip which, we may assume, was for a suspension thong. Along with pottery and other objects, there were found the skeletons of at least 49 people, over half of them juveniles and children. In another cave, one blowing shell was found, again along with skeletons (in many of the caves complete shells were also found, hence in these cases the use of ‘blowing’ for those whose apices have been removed). In a third cave, the Caverna della Arene Candide, 18 blowing shells were found, and for this cavern Skeates provides a radio-carbon date of 5316–5005 BCE. Again there were skeletons and again many of these were of young people.

He also lists two caves in the Abruzzo area, to the east of Rome on the Adriatic coastline, and one of these, the Grotto dei Piccione (the Cave of the Rock-Doves) is the most important of all because it has been very well recorded. The *C. nodifera* there, which Skeates illustrates, is again a blowing shell, 165 mm in length, with a suspension hole in the lip. The shell was stained with red ochre, a sure sign of ritual importance with archaeological finds, and it was found among the many small stone circles on the floor of the cave, each of which contained children’s bones. Most of these circles were surrounded by areas blackened by fire and charcoal; around circle XI, near which that shell was found, there was much pottery, with the bones of ducks and hares, suggesting funeral feasting. Carbon dating places the shell in the later Neolithic Ripoli culture of 3780–3340 BCE.

He lists nine further Italian sources, most of them undated other than Neolithic, with unspecified numbers of shells, but using the plural for most sites, so that the total number must be considerable. Also there were many broken shells, which may or may not have been trumpets, as well as complete shells, and frequently there were also bracelets and other adornments made from shells. Interesting, too, is the frequent association of the shells with the remains of children and young people. This may simply be due to a high youth death rate in the Neolithic, but it seems also likely to indicate some association with a belief in renewal or future life in general, and especially of the young. Certainly Skeates emphasises the ritual aspects, for all these examples were found with burials and none, so far, has been found elsewhere. But he also raises the possibility of symbolic use, especially in the use of adornments, for which he cites also a late Neolithic example in Switzerland, though of course we can have no knowledge of what they might symbolise. Such shells are still used in Switzerland today, by hunters in Cantons Arrgau, Friburg, Jura, and Solothurn, as signal instruments. These are Mediterranean shells, either *C. nodifera* or *C. variegata*. They are also used in the Swiss Canton Ticino, in the area of Malcantone, to replace the church bells in Holy Week.⁵

⁵Brigitte Bachmann-Geiser, *Die Volksmusikinstrumente der Schweiz* (Handbuch der europäischen Volksmusikinstrumente; Serie I, vol. 4 Leipzig 1981), 90 and Tafel 44a, and by email 1 March 2017.

Di Nocera and Marano give further examples.⁶ A *C. nodifera* with the apex removed was found in a burial at Su Carroppu in southern Sardinia, an early Neolithic site from the sixth millennium BCE. Another was found in a *tholos*, a Mycenaean style tomb, at Kephala in northern Crete from 1400 to 1200 BCE, and another from much the same date at Peristeria, Messenia, in the south of Greece.

The Etruscans knew the conch, too, for one was found in a tomb of the Poggio dell'Impiccato necropolis in Tarquinia, dating to the first half of the eighth century BCE, and it is clear that the use of conchs survived as a continuous tradition in Italy into early classical times. Many Roman, and also ancient Greek sources, credited the Etruscans with the invention of the metal trumpets such as the *lituus*, *tuba*, and *cornu*. According to Gaius Julius Hyginus, a late first-century BCE fabulist (thus not wholly to be trusted in what he records), Tyrrhenus, a son of Hercules and the legendary leader of the Etruscans into Italy, 'first invented a trumpet for this reason: When his comrades were apparently feasting on human flesh, the inhabitants of the region around fled from the cruel practice. So when any one of them died he blew on a hollow conch-shell and called the district together, and declared they were to be giving burial to the dead

⁶Gian Maria Di Nocera and Francesco Marano, 'Sounds from the Sea: Prehistoric Shell Horns', kindly made available to me by Dr Peter Holmes of the EMAP project.

and not devouring them'.⁷ Until very recently only one Etruscan conch had been found, the one from the Poggio dell'Impiccato necropolis in Tarquinia, mentioned earlier. It is identified as a *C. nodifera*, with the apex removed, and it is now in the Museo Archeologico Nazionale in Florence, no. 83379/c. A photograph of it can be seen on page 263 (fig. 48a) and on the front cover of a book that covers a huge number of Etruscan instruments: *La Musica in Etruria*, ed. Marilena Carrese, Emiliano Li Castro, and Maurizio Martinelli (Tarquinia: Comune di Tarquinia, 2010). Another one was very recently found by Professor Lucio Fiorini in an Etruscan religious complex, but it is as yet unpublished.

The tradition continued with the Romans, in mythology, in literary references and in sculptures (and in the later Baroque of the sixteenth and seventeenth centuries with artists such as Bernini), not only of Tritons in mythological scenes, but also on sarcophagi and other funerary scenes. One of these is a stucco relief in a subterranean basilica in Rome.⁸ This shows a scene of a woman's soul travelling over the seas in a boat with a Triton blowing a conch with one hand and holding an oar with the other, which strongly suggests a link between the Triton legend and Charon, who is often shown with an oar ready to welcome the

⁷Fabula 274, accessed via <http://www.theoi.com/Text/HyginusFabulae5.html#274>. Emiliano Li Castro kindly provided this reference in a forthcoming paper.

⁸Skeates, *op. cit.*, 23.

dead to his boat, before rowing them across the River Styx to Pluto's realm of Hades.

At Pompeii a large shell, incorrectly called a *Strombus* but actually a *C. nodifera* with the apex removed, was found in the courtyard of a house, the Cassa Menandro, at Pompeii, where it was overwhelmed by the famous eruption of Mount Vesuvius in 79 CE.⁹ According to Reese, a total of 62 such shells has been found in the vicinity, 52 in Pompeii, 9 from Herculaneum, and 1 from Boscoreale, a lesser-known town just to the north of Pompeii that was also overwhelmed in the same eruption. Not all of these were blowing shells, but a considerable number were or may well have been. At least two had bitumen at the apex and an added bronze mouthpiece, one of them the one from Boscoreale, a *C. variegata*, and four are listed as having a nicely ground-down embouchure, to avoid cutting the blower's lip. In addition, portrayals of two conchs appear in mosaics from Pompeii, now in the Naples Museum.

The tradition continues into modern times, with one Italian archaeologist writing in 1910 that when he was a child, the sacristan gave him a triton shell to blow in a Holy Week service in

⁹Skeates, 23, and David S. Reese. 'Marine Invertebrates, Freshwater Shells, and Land Snails: Evidence from Specimens, Mosaics, Wall Paintings, Sculpture, Jewelry and Roman Authors', Chapter 13, pp. 292–315 in Wilhemina Feemster Jashemski and Frederick G. Meyer, *The Natural History of Pompeii* (Cambridge: CUP, 2002.).

Piedmont. Another wrote that in Genoa *C. nodifera* was blown in the Cathedral in Holy Week.¹⁰

There are conchs in the Pitt Rivers Museum in Oxford that, according to Henry Balfour's notes, were blown in rituals at Piedigrotta (*grotta* is a cave in Italian, as in our grotto) near Naples.¹¹ There is an annual festival there, held on the night of 7th-8th September, the Nativity of the Madonna. It could be that the use of shells for the Nativity of the Madonna is the survival of some form of Venus nativity cult, for she was born from the sea, as in the famous painting of *The Birth of Venus*, by Botticelli. The shells that are used there nowadays are not the traditional *C. nodifera*, but a different species: *Strombus gigas* Linnæus, which nowadays is called *Lobatus gigas*. These are the queen conch shells from the Caribbean area, and in Italy they are the waste products from cameo carvers. The lip of the shell, with its natural layers of pink and white, is sawn off for this trade, and the rest of the shell, instead of being thrown away as rubbish, then can have the apex cut off to be used as a trumpet for that Festival and for any occasion such as carnivals, etc.

On the island of Ischia, conchs were sounded to scare thieves and birds from vineyards and gardens; on Elba and Sicily they were blown to summon labourers and others and Sicilian fish-

¹⁰Skeates, 24.

¹¹Balfour was the Curator of that Museum from 1893 to 1939, and its greatest donor other than General Pitt Rivers himself.

ermen also used them on their boats and to signal that their fishing was successful and that fish would be available for sale as soon as they had landed. Sergio Bonanzinga told me, too, that there are also annual festivals in the various Sicilian fishing ports near Catania, celebrating the fishing, with pantomimes, dancing, street processions and bands, and fireworks, including conch blowing.¹²

In another article by Bonanzinga, describing Sicilian folk customs in Holy Week, Carnival and similar occasions, he notes a celebration of Shrove Tuesday (Martedì Grasso) in Saponara, a small town in the north-east of Sicily, not far from Messina, where there is a Prince, Princess, courtiers, and a bear with two hunters, accompanied by a special rhythm on a number of conchs (*brogni*) and drum – one of his photographs shows at least three conch blowers and another shows a conch blower with band instruments, where it accompanies dancing.¹³ A detail photo of another conch that he shows, in the Museo Pitрэ (inv. n. 2838), has an added mouthpiece of metal called ‘piombo’, which, as Bonanzinga has confirmed to me, is not pure

¹²Sergio Bonanzinga and Marta di Mariano, ‘Una pesca mimata per incantare il mare. Il dramma dell’uomo-pesce nella Riviera dei Ciclopi’ in *Santi a mare. Ritualità e devozione nelle comunità costiere siciliane*, ed. I. E. Buttitta and M. E. Palmisano. (Palermo: Regione Siciliana, 2009), 67–85.

¹³Sergio Bonanzinga, ‘Oggetti sonori e simulazioni rituali’, in *Il potere delle cose. Magia e religione nelle collezioni del Museo Pitрэ*, ed. Ignazio E. Buttitta. (Palermo: Eidos, 2006), 83–98.

lead but a form of pewter, an alloy of metals such as tin, copper and lead, which is harder and thus more stable as well as marginally less poisonous than is lead. He also lists other occasions when conchs are featured, such as around Christmas when a masquerade of the *Strina* or *Vècchia* takes place all over Sicily. He says, too, that conchs are widely used in fishing, hunting, calling cattle, frightening away wolves, during the vintage, olive harvesting and oil and grain production, and making ice from the snowfields. And as above, it is widely used for carnivals and such like occasions.

Finally for Sicily, an article by Angela Bellia lists an end-blown conch from the third century BCE that was found at the archaeological site of Morgantina in central Sicily.¹⁴ This is a site associated with the nymph cult, and Bellia cites an article linking nymphs with the conch.

As in Sicily, the conch is widely used in Italy for similar occasions. Febo Guizzi shows a conch blower on Good Friday and he also quotes the rhythm used for the bear dance in Saponara as eight semiquavers, two quavers and a crotchet (eight sixteenth

¹⁴Angela Bellia, 'Oggetti sonori e strumenti musicali in Sicilia dal Neolitico al Bronzo Antico e dall'Età del Ferro all'Età Arcaica, Classica ed Ellenistica', in *Strumenti musicali in Sicilia*, ed. Giovanni Paolo Di Stefano, Selima Giorgia Giuliano, Sandra Proto (Palermo: Regione Siciliana, 2013).

notes, two eighth notes and a quarter note in other terminology).¹⁵

Returning to antiquity, we move to the islands in the middle of the Mediterranean. We have conchs from Malta, from the megalithic sites such as Ħaġar Qim and the Brockdorf Circle, which have been dated to between 3600 and 3200 BCE. These are temple sites, stressing the evidence of cultic use.¹⁶ The conch is still used in those islands, or was until very recently, for all the normal purposes, for warnings and by fishermen at sea as one would expect, and it was also used as a Carnival instrument, along with cow horns. It was also used especially as a signal instrument by millers, to tell the farmers that the wind was blowing with sufficient strength to turn the stones and thus to grind corn, and that they should bring their grain to the mill.¹⁷ Sir Kenneth Oakley told me back in the 1960s, that he had met a miller, who was then 80 years old, on the Maltese island of Gozo who told him that he used to blow a conch to signal that a cart was about to go round the farms to collect bags of corn.

¹⁵Febo Guizzi, *Gli strumenti della musica popolare in Italia* (Lucca: LIM, 2002), 255.

¹⁶Anna Borg-Cardona, 'The Marine Shell in and around the Maltese Islands', *GSJ* 66 (2013).

¹⁷Borg-Cardona *ibid*, and Anna Borg-Cardona, *Musical Instruments of the Maltese Islands: History, Folkways and Traditions* (Valletta: Fondazzjoni Patrimonju Malti, 2014).

On all the Mediterranean islands many fragments of shells have been found from the Neolithic periods, but even if broken off apices are found we cannot be sure whether the rest of the shell, which is missing, was a blown one or not, nor can we be certain, even when we have a conch with the apex removed, that it was used for blowing, although it remains a valid assumption that it was blown. It might, for example, have been used as a libation vessel to ensure a narrow stream of liquid, or as a funnel. My inclination, being prejudiced in this matter, is to assume that they were in fact blown. Parts of shells were put to many uses, to use as spoons, awls, and scrapers, to make cups, bracelets and other personal adornments, and so on, or perhaps they had been broken to extract the inhabitant for food, so these fragments we ignore here, though Skeates lists all that have been found.

On the island of Crete, one blowing shell was found in the Neolithic strata at Knossos and another, with the apex removed and stained with red ochre was found at Phaestos, as well as a later one (1900–1700 BCE) with ‘a nicely worked apex’ in a shrine next to a table of offerings.¹⁸ There was also another blowing shell at the early Minoan site of Myrtos along with the fragments of 29 other shells, and three blowing *C. nodifera* at Mallia.

¹⁸David S. Reese. ‘The Late Bronze Age to Geometric Shells from Kition’, Part II of Appendix VIII(A) in V. Karageorghis, *Excavations at Kition V/II* (Nicosia: Department of Antiquities, 1985), 340–71.

It is here, on Crete, that we link with the Bronze Age Greek legends. As we said earlier, the demi-god Triton and his father, Poseidon, were particularly associated with the conch. Poseidon was both a sea-god, as one of the Twelve Olympian gods and, it is suggested, perhaps earlier a horse-god, which might be a connection with the Hungarian shells below, for the Magyars seem originally to have been horse people. Poseidon and his brother Zeus were each a son of Kronos and, according to legend, were each saved by a different means from their father, who had the habit of eating his new-born sons. Poseidon was saved by his mother, and Zeus was saved by the young men, the *kourētēs*, who clashed their swords on their shields to drown his birth-cries. The Zeus cult site, where he is said to have been born, in the Idaean Cave on the Mediterranean island of Crete, has produced many conch fragments from both the Neolithic period and from the early bronze age of the Minoan culture and, more importantly, an engraved seal of what is normally assumed to be a priestess blowing a conch (her costume appears to be that of a female, but this is uncertain and some authorities have suggested that he or she may merely have been an acolyte rather than a priest/ess).¹⁹

Jackson quotes one of the scholiasts on Homer, saying that ‘before the discovery of the brazen trumpet by the Tyrrheni-

¹⁹Sir Arthur Evans, *The Palace of Minos*, vols. 1–4 (London: Macmillan, 1921–35): vol. 4, 344, fig. 288.

ans [the Etruscans] the conch (*Triton nodifera*) was used by the Greeks for land and sea fights and for setting the watch'.²⁰

Conch skeuomorphs in both pottery and stone have also been found at Minoan sites on Crete.²¹ Skeuomorphs are the products of craftsmanship, usually in different materials such as those, in imitation of natural or other objects.²² The stone ones that I have seen in the Ashmolean Museum in Oxford, where much of Evans's material is displayed (more are in the Heraklion Museum in Crete), are not blowing conchs and presumably they were libation vessels, as were the bronze skeuomorphs of the shells of giant land snails in Benin in Nigeria. Alternatively, it is possible that they were simply decorative items, to link a temple or other site with its titular deity. I have no information about the pottery ones, but since all were fragments, it may not be possible to determine whether they were blowing shells or not. Evans refers to one of white marble, though more recent references have corrected this to alabaster, and to another, found at Haghia Triada, made of obsidian or volcanic glass from the Aeolian Islands. I cannot readily believe that it was possible to carve the full shape of the shell, both interior and exterior, in stone, still less in obsidian, though Evans refers to the latter as

²⁰Wilfred Jackson, *Shells as Evidence of the Migrations of Early Culture* (Manchester: Manchester UP, 1917), 30.

²¹Evans, *ibid.*, vol. 1, 222, fig. 167.

²²Laurence Picken, *Folk Musical Instruments of Turkey* (London: OUP, 1975), 195.

‘an almost exact copy of the ... shell known as *Dolium perdix*’, preferably known as *Tonna perdix* (Linnæus), so presumably these are simply copies of the external form.²³ *Tonna perdix* is a Red Sea shell with a rounded body, from which it is also known as the partridge tun, for it resembles, in both shape and colour, the body of that bird. Reese, however, states that these skeuomorphs are usually copies of either *Charonia* or *Cymatium* shells, and this is more likely to be accurate.²⁴ He gives many more materials: serpentine, as well as the alabaster above, from Knossos; chlorite, chloritic schist, and terracotta from Mallia; serpentine and pink faience from Pyrgos Myrtos; serpentine and obsidian from Palaikastro, and other shells of similar materials. He also notes other shell copies from other islands: Thera in the Cyclades, Rhodes in the Dodecanese, and also Mycenae on the mainland of Greece, all of which emphasise the great importance of the conch in this area, for if they were not important, why go to the trouble of making copies in these somewhat intractable materials if there were plenty of natural shells littering the beaches? This, the use of skeuomorphs, is a subject that we shall meet again in India, in Cambodia, and in the Central and Southern Americas.

²³Evans, *op. cit.* vol. IV p. 110, illustrated in vol. II pl XXXIb. That ‘shell’ is Heraklion Museum 360; there are two alabaster examples there, HM 177 & 45, and there are also obsidian fragments, HM 1008.

²⁴Reese, *Kition*, 1985, 354.

Reese goes on to list real shells found in deposits on a number of the smaller Greek islands. Many of them were used as vessels and other objects, just as they were in Italy, but others are complete shells, and some of them appear to have been blowing ones: one on Melos, another on Kythera from 1500–1400 BCE, and a third on Rhodes.

On Cyprus, Reese notes a number of shells in the sacred area at Kition, including one blowing shell, a *C. nodifera* 210 mm long and 138 wide with a smoothed-down embouchure 20–23 mm in diameter, and another probable blowing shell from Hala Sultan Tekké, a Muslim shrine with a mosque near Larnaca on Cyprus.

On the mainland of Greece, Skeates notes a worked triton shell from the Neolithic period found in the Kitsos Cave in Attica and another at Megala Pevkakia in Thessaly.²⁵ The conch is still used in the Greek islands, where Fivos Anoyanakis describes it under the name of *bouroú*.²⁶ Laurence Picken suggests that this name is Turkish, although he also gives the more common Turkish name as *kabuk* (shell). Picken's reference to the Turkish use of the conch is clearly hearsay: just that the *kabuk* is used for signalling by fishermen working off the coast of İçel, a province on Turkey's south coast close to the eastern

²⁵Skeates, *op. cit.*, 21.

²⁶Fivos Anoyanakis, *Greek Popular Musical Instruments* (Athens: National Bank of Greece, 1979), 202, pl. 83.

end of the Mediterranean, near the Syrian border, and that no details are known.²⁷ Neither Anoyanakis nor Picken mention a species, but Anoyanakis's photograph is clearly that of a *Charonia variegata*.

Anoyanakis gives us quite detailed information. He says that the tip of the shell is patiently scraped against a hard stone to open a mouthpiece. It is then used as a trumpet to broadcast messages, especially among seafaring people in coastal areas and on islands. It may announce the arrival of a cargo: “‘Sound the bouroú for them to come down’, says the captain to the deck-boy”. It can be used to signal passengers to prepare for the departure of a ferry boat with a long, held note, and then with a series of shorter blasts to make them hurry down to the ship, the latter a signal that is also used in fog or as a call for help. He says, too, that in Crete not long ago the conch was also used by postmen to warn of their approach and by shepherds to gather their flocks, and in Cyprus by Greek camel-drivers when one of their herd had wandered off from the caravan. It was also used in the Peloponnese to chase away wolves in winter. And again in Crete, when shepherds took their flocks to the islets around the coast for some months for pasturage during the winter, if one of the shepherds died, his fellows would signal this to the villages on the mainland – this of course being before the days of mobile phones. On the island of Skyros it was used for the

²⁷Picken, op. cit., 552.

Carnival, a particularly uproarious affair with goatherds laden with arrays of goat bells attached to their costumes.

Returning again to antiquity, at least one conch of the late Bronze Age, 1400–1200 BCE, was found at Tel Nami, a site on the coast of Israel south of Haifa, where much other Mycenaean material has been found. It was a town with links to Crete and Cyprus, where, as we have seen, conchs were also commonly used.

Over a dozen conchs have been found in Israel, ranging in date from this example through the Iron Age into the Hellenistic period. Two early Iron Age conchs were found at Tel Qasile, from around 1200 BCE, and at Megiddo, the biblical Armageddon, from a century or so later.²⁸ These are all from the coastal plain, what was in biblical times the area of the Phoenicians and the Philistines, peoples to whom we shall return, and they were found in cultic contexts so that these shells may have been used in the worship of Dagon, both a fertility god and a fish god, who was perhaps also associated with triton shells, analogously to the Greek Poseidon. However, another conch was found at Hazor, a site overlooking the Jordan Valley, north of the Sea of Galilee, dating from the ninth century BCE, and Batya Bayer has suggested that this might possibly have been an Israelite

²⁸ Amīhāi Mazār, *Tel-Qasile* (Tel Aviv: Museion Ha’Aretz, 1983, in Hebrew), 19 and illustrated on p. 25.

signal trumpet.²⁹ It seems possible, alternatively, that it was imported by the pagan Queen Jezebel who persecuted Elijah and slew all the other prophets of the Lord (I Kings 19), and whose father was the king of Sidon, a Phoenician city. Later conchs, from Shiqmona and elsewhere, are from the Hellenistic period in the fourth century or so BCE.³⁰ These shells are all of the species *Charonia nodifera* (Lam.).

Reese cites one shell from Tawilan, an Edomite site just to the north of Petra in southern Jordan. This is a spider or scorpion conch, *Lambis truncata sebae* (Kiener) with a worked mouth-piece.³¹

Rather further afield, Galpin mentions an end-blown conch from Nineveh, a city on the banks of the Tigris in northern Mesopotamia, one that was described as a great city in the biblical

²⁹Batya Bayer, 'The Conch Horn of Hazor', *Tatzlil* 3 (1963): 140–2 in Hebrew, English synopsis: 209.

³⁰For a general survey of the Israeli conchs, see Joachim Braun, *Die Musikkultur Altisraels/Palästinas* (Freiburg, Schweiz: Universitäts Verlag, 1999), 137–40. The English translation, *Music in Ancient Israel/Palestine* (Grand Rapids, MI: William B. Eerdmann, 2002), 180–83, is less detailed and lacks all references.

³¹David S. Reese. 'Marine Invertebrates and Fossils', Chapter 10 in C.-M. Bennett and P. Bienkowski, *Excavations at Tawilan in Southern Jordan*; British Academy Monographs in Archaeology 8 (Oxford: OUP, 1995), 93–96, and fig. 10.1 on p. 345.

book of Jonah.³² Galpin gives a date of 700 BCE for this shell and names it as an Asiatic *Tritonium variegatum*, but this is a misnomer for *Charonia variegata* (Lam.), which has also been known as *Charonia sequenzae* (Aradas & Benoit), a Mediterranean shell. He mentions also the use of the conch in Persia, Afghanistan, and elsewhere, saying that today in Persia it is used as a summons to the bath.

The Phoenicians spread, from the coastal plain of what is now Israel, across the Mediterranean early in the first millennium BCE. They set up a settlement at Motya, a small island the whole of which is covered by its city, just off the western coast of Sicily at Marsala. A *C. nodifera*, from the fifth century BCE with the apex removed, was found there, near a temple site. Another was found at Sulky in Sardinia (now called Isola di Sant'Antioco).

The Phoenicians eventually established a major base in Carthage, where they became known as Punics.³³ Thence they spread into Spain, with settlements around Gadir, which is now

³²Francis W. Galpin, *The Music of the Sumerians and their Immediate Successors, the Babylonians and Assyrians* (Cambridge: CUP, 1936; reprint Strasbourg: Heitz, Strasbourg UP, 1955.), 24.

³³Antonio M. Sáez Romero and José M. Gutiérrez López, 'Sounds for Gods, Sounds for Humans: Triton Shell Horns in Phoenician and Punic Contexts from the Western Mediterranean', Chapter 3 in Raquel Jiménez, Rupert Till, and Mark Howell (eds.), *Music and Ritual: Bridging Material and Living Cultures* (Berlin: Ekho Verlag, Publications of the ICTM Study Group for Music Archaeology, Vol. 1, 2013), 63–92.

called Cádiz, on the Atlantic coast, and with others further along the Mediterranean shore on to what is now the Costa del Sol. Here we can see increasing evidence becoming available for archaeological shells from the Phoenician and Punic times. Many possible blowing shells have been found in or around the city of Gadir, though the precise number is unclear in this article. *Charonia* shells have been found in fishing contexts, for the blue-fin tuna was just as popular then as it is today, and, unusually, in pottery workshops. One conch found in Gadir has a reasonable embouchure and what looks very like a fingerhole in the last whorl above the skirt.³⁴ The fingerhole was clearly carefully drilled and is ‘less than 1 cm in diameter’. This shell was found in a salt-fish factory, which was one of Gadir’s major industries. Not only was salt fish popular all over the Mediterranean but it must have been a staple food for the many trading journeys that the Phoenicians made from Gadir, for that was the base for their trading voyages to Cornwall in Britain in the search for tin, an essential ingredient to turn copper into bronze, and for their voyages far down the West African coast. Two further conchs were found in a well in Gadir, with connections to a nearby necropolis, and the authors suggest that these may have been used at funerary feasts and other rituals there. Even earlier, there is evidence for the use of shells in this same area in the Neolithic to Chalcolithic period, long before the Punic times.

³⁴Sáez Romero and Gutiérrez López, *op. cit.*, figure 6.

The Punics also settled on the other side of the Straits of Gibraltar, into Morocco, then called Mauritania, with, from the third century BCE, bases around the Martil River valley inland from what is now Sidi Abdselam del Behar on the Mediterranean side. In one room of a house at Tamuda on the Martil River, a group of cultic objects was found, among them a conch with the apex removed. Another was found at Kitane, further down the river. To my eye, both these conchs seem to have had rather too much of the apex removed, leaving rather too wide an embouchure that could make them difficult to blow, and with sharp edges that might cut the lip. Further shells have been found on the northern Mauritanian shores of what is now Morocco in the final Punic period, prior to the destruction of Carthage by Rome in CE 40–42, again linked to fishing and salt-fishing industries, and also with suggestions that the inhabitants of the shells were part of the local food consumption.

The archaeological work in this area, of both Morocco and Spain, has only begun in the last five years and we may look forward to many more such discoveries, for the map in the article cited in footnote 33 shows Punic settlements all along the Moroccan coast, from Essaouira on the Atlantic coast to Russadir (now Mellilia), not far from the Algerian border in the Mediterranean.

In modern times, as we shall see below, there is no evidence for the use of conchs in Morocco, but their use does continue in Spain, whence I have a modern one. This is a shell of the

C. variegata species, fig. 1-1 shown towards the beginning of this chapter, which comes from Catalunya on the Mediterranean coast of northern Spain. Such shells are still used there by fishermen, partly as signal or fog horns at sea, and also often on the shore to signal that the boats are in and that fish are unloaded and ready for sale. Similar shells are used for dance music in, the *Baila del Ibio* at Santander, with slurred deflections of pitch by a semitone (d'-e♭'-d'), produced by covering the bell with the hand to lower the pitch of the first and last note, and then opening it for the higher note.³⁵ The tip of the spire of the Catalan shell shown here is cut off a little lower than usual and so the embouchure is rather wide (not as wide, though, as the Punic ones referred to above), but the edge is worn, showing that it has been well used as a trumpet. The shell has been varnished, something that by itself would suggest an ornamental rather than a practical function, but a blowing shell could well have been varnished subsequently as an ornament.³⁶

Judith Cohen has told me that on the nearby island of Eivissa (Ibiza), the conch is known as the *corn* in the local Ibizan-Catalan

³⁵Anthony Baines, *Brass Instruments, their History and Development* (London: Faber, 1976), 43.

³⁶It was bought on the market at Sabadell, near Barcelona, by Maria-Antònia Juan i Nebot, who gave it to me. Its catalogue number is XI 280 and its dimensions are OL 214; OW c. 150; OH 97; emb Ø 20.8; pitch e'-10 cents.

language known as Eivissenc.³⁷ They were used by fishermen both to communicate boat to boat and also again to signal to the shore that fresh fish is arriving, and in olden times to warn of attack by pirates. Her informant, Esperanza Bonet Roig, told her that people could recognise individual fishermen by the sound of their horns and that the size of the embouchure must be neither too big nor too small for a good sound. She said that the inhabitant of the shell had to be carefully removed so as not to damage the shell, and that then the fishermen took the inhabitant home where it was prepared with either a sauce of onion, tomato and pepper, or used in a paella, a rice and fish-broth dish. Today, folklorists are staging contests for *brular es corn* (blowing the conch) and for the characteristic long-distance wordless call, the *uc*.

This use of conchs by fishermen and other sea-farers is endemic to the present day, throughout those European countries that have a Mediterranean or an Atlantic sea-coast, and most commonly by fishermen. They are also used for other purposes, and Wilfred Jackson, who was cited above and whom we shall quote again below, provides a mine of information on this as well as on fishermen's use.

One of the main uses by fishermen, of course, is as a foghorn. There are two *Strombus gigas* shells in the Pitt Rivers Museum in Oxford which are catalogued as having been used as foghorns

³⁷Judith Cohen, by email, January 2016.



Figure 1-2: Reed-blown foghorn, c. 1930s, Montagu Collection, I 142b.

in Falmouth on the southern coast of Cornwall. This use in Britain was prohibited by the Board of Trade in 1863 for ships over 20 tons in gross weight, insisting that all foghorns should be mechanically sounded. Even smaller vessels, in recent times, have been encouraged to use metal horns with a reed, like that of an old fashioned bulb-blown motor horn, because it can be difficult to get the lips to function for trumpeting in very cold weather. Producing a spluttering sound while trying to get a conch blown properly is little protection against being run down by a larger ship! Small single-reed horns are produced today for yachtsmen (fig. 1-2), and larger ones, attached to a foot pump for the sake of a stronger air supply, for fishing boats and similar craft.

A quite common inland use in many parts of the world is on farms for a variety of purposes. A very comprehensive source for such uses is Wilfred Jackson's chapter on 'Shell Trumpets and their Distribution', but his theories on their indications for the migration of peoples and religions in other chapters should be treated with great caution.³⁸ He lists uses for cattle herding in Italy, in North Wales and in Staffordshire in Britain; in France around Nice on the Mediterranean coast; in Lithuania; and in European Russia. He gives other uses, also, for example for the charivari. This is an improvised loud music characteris-

³⁸Wilfred Jackson, *Shells as Evidence of the Migrations of Early Culture* (Manchester: Manchester UP, 1917); the relevant chapter is pp. 33–69.

tic of southern Europe, with friction drums and pots and pans beaten with spoons etc., with which local populations serenade inappropriate marriages, liaisons, and other misbehaviours, to express the neighbours' disapproval. He says, too, that in Corsica the eighteenth-century militia used conchs instead of drums and trumpets. He also cites far more examples from Asia, Oceania, and the Americas, to which we shall return in later chapters.

Mahillon in his Brussels Catalogue cites a use of the *biou* by horse herds in the Carmargue.³⁹ Hornell mentions herdsmen in Corsica and Sardinia using conchs to gather their scattered herds,⁴⁰ and Jackson cites similar examples in north Wales and Staffordshire in Britain,⁴¹ and, on the same page, of farmers on the island of Ischia using conchs to scare away thieves and birds from their vineyards and gardens. A lady in Merioneth remembered large 'yellowish-white' shells being used to signal the midday meal on a farm,⁴² and there are many other similar stories by shepherds and others who find horns of any sort useful, where they may signal to those who are working in the

³⁹Victor-Charles Mahillon, *Catalogue Descriptif & Analytique de Musée Instrumental du Conservatoire Royal de Musique de Bruxelles*, Vol. 4 (Gand: Ad. Hoste, 1900; repr. Bruxelles: Les Amis de la Musique, 1978), 256.

⁴⁰James Hornell, *The Sacred Chank of India: A Monograph of the Indian Conch (*Turbinella Pyrum*)*, (Madras: Madras Fisheries Bulletin 7, 1914), 122.

⁴¹Jackson, op. cit., 42.

⁴²Mary Corbett Harris, 'Memories of Merioneth Farms', *Country Life*, 1960, Nov. 3.

fields that it is time for meals and such purposes. I have such a shell that I bought in Iowa which the vendor told me had been used for that purpose; this we shall meet in chapter 6.

Another inland use takes us back to the mainland of Europe, to Bohemia, the western part of what is now the Czech Republic, around Plzeň (better known by its German name of Pilsen due to its famous breweries). Ludvík Kunz records the use of mostly *C. nodifera* shells, partly for signalling and other purposes, some of them ritualistic, by shepherds and others, but their main function there is to avert rain and thunderstorms, from which use they are known in German as a *Wetterhorn*.⁴³ As with the mouthpiece of *piombo* mentioned previously, these conchs have added mouthpieces of a metal that looks like pewter, closely similar in shape to the normal cornet or trumpet mouthpiece of the area. I have seen them only through the glass of a museum showcase, so I cannot be more precise. This use of the sound of instruments as prophylactics against storms, for example that of church bells in France, is recorded in a number of places, but so far as I know this is one of the few such instances of conch trumpets. We can hear an example of this use in a concerto for string instruments by Vivaldi, entitled *Conca* and dating from the 1730s.⁴⁴ This consistently imitates the sound of a conch, mostly in re-

⁴³Ludvík Kunz, *Die Volksmusikinstrumente der Tschechoslowakei, Teil 1* (Handbuch der europäischen Volksmusikinstrumente I:2) (Leipzig: DVfM, 1974): 130–33.

⁴⁴Cat. no. RV 163 and F. XI, 5.

peated octaves, the first, second, third, and fourth partials of a conch in B flat, while also imitating the sounds of a tempest, all this of course being played on the string instruments.⁴⁵ While this may indicate an Italian prophylactic use, similar to the Bohemian, it is also possible that Vivaldi was, as with a number of other works, intending to provide a concerto for one of his patrons in the Austro-Bohemian area, which then included what is now the present Czech Republic. If so, it may also indicate a long history of this use in that area.

Now we again go a considerable distance from the sea, and we step back in time to the Chalcolithic or Copper Age, the time between the Neolithic and the Bronze Ages, when the use of copper (Chalco-) was coming in, but was hammered like a stone (-Lithos) in a forge, rather than being cast in a mould or being alloyed with tin to make bronze. Here we have two shells dating from around 3500 BCE and they are Hungarian, from the Baden-Pécel settlements, over 200 miles from the nearest sea-coast.⁴⁶ Both appear to be *C. variegata* shells and they are now in the National Museum in Budapest. One was found in a grave at Békásmegyér II, a suburb of Budapest,⁴⁷ and the other was in

⁴⁵Michael Talbot, 'Vivaldi's Conch Concerto', in *Informazioni e Studi Vivaldiani* 5 (1984), 66–82.

⁴⁶Jeremy Montagu, 'The conch in prehistory: pottery, stone and natural', *World Archaeology* 12:3 (February 1981): 273–9, pl.11 and 12.

⁴⁷Nandor Kalicz, *Die Pécelér (Badener) Kultur und Anatolien – Studia Archaeologica* 2 (Budapest: Akadémiai Kiadó, 1963), 65.

what was described as a cult house at Fenépuszta near Kesthely on Lake Balaton,⁴⁸ so it has been presumed that, like so many shells that we have met in this Chapter, they were probably used as ritual instruments. That they were found quite a long way from the sea is yet another argument in favour of their importance, a detail that we shall see with other shells in other places. If people take the trouble and make the effort to transport shells over long distances, and presumably devote some of their property to trade or barter for them, then surely they must be important, and further, it indicates that it must be culturally important to use a shell, rather than any other type of horn, and this again suggests a cultic use.

We have covered shells on the islands and on the eastern, northern, and western shores of the Mediterranean, and also well inland, but what about the southern shores? I have found no evidence at all of their use anywhere on those shores. There is no archaeological evidence for conchs in ancient Egypt – Hans Hickmann seems never to have mentioned a conch in any of his many books and articles on music in that land. There is no ethnographic evidence in books and articles that I can find for conchs there, nor in Libya, Tunisia, Algeria, nor Morocco, other

⁴⁸Nandor Kalicz, 'A rézkori balatoni csoport Veszprém megyében', *A Veszprém Megyei Múz. Közleményei*, 8 (1969), 83–90 and Kalicz, 'Über die chronologische Stellung der Balaton-Gruppe in Ungarn', 131–65 in *Symposium über die Entstehung und Chronologie der Badener Kultur*, ed. B. Chropovsky. (1973).

than the antique Punic uses. The peoples in all those areas use trumpets, from Tutankhamun's in ancient Egypt down to the mediaeval and modern metal long trumpet, *al nafir* – the origin of the mediaeval Spanish *añafil*, from which all our modern trumpets derive – but never a conch. Why not? We do not know. It is not credible that *C. nodifera* refuses to visit the southern shores of that sea, so it can only be either a lack of archaeological discovery, a lacuna in ethnographic reports, for we depend entirely on what people have published, whether local scholars or those visiting the area, or perhaps it is a matter of cultural preference: metal trumpets, yes, but shell trumpets, no. I have found no evidence for dry-land animal horns either, save for the Jewish use of the *shofar*, which is ritually enjoined for all Jewish communities, of which there were, and in some places still are, many along that southern shore.⁴⁹

This absence seems so improbable that we can only hope that evidence will appear sometime in the future.

⁴⁹Jeremy Montagu, *The Shofar* (Lanham, MD: Rowman and Littlefield, 2015).

The Conch in Africa and Nearby

We have no evidence for the use of conchs in the Red Sea, though there are plenty of different varieties there, some large enough to blow, and of course there are also fishermen, so again it seems probable that this may be due to the lack of reports, rather than the absence of use.

Further south, in Africa, shell trumpets are reported only down the eastern coast, but even this covers a fairly limited length of that coast, running from southern Somalia, Kenya, and Tanzania down to Madagascar, and here all the conchs are side-blown. Sir Kenneth Oakley heard shells blown in Kenya by boatmen at the Mtwapi and Kilifi hand-hauled ferries between Mombasa and Gedi.¹ He said that hand-stopping was used there on side-blown *Bursa* conchs, the frog shell, similar to that in fig. 2-1, as a signal to begin and finish hauling the ferry, but he gave me no indication of the pitch range produced. His photograph shows the bell facing back, as one would expect for a hand-stopped conch.

Graham Hyslop also encountered a shell at one of the same ferries, which were hauled to and fro on a chain fastened to each

¹Oakley, in letters to me on 2 February 1967 and 16 February 1967.

bank.² Those who hauled were united by song and, he said, by dance and the conch provided the accompaniment, the player producing different notes, with a fundamental of the E above middle C. The shell, which he acquired and illustrates, is a side-blown *Bursa*, 20 cm long and 11.5 across at its widest point, and he says that ‘The shell has been in use for so long that some of the knobbls had worn quite smooth.’ He does not say how the ‘different notes’ were produced, nor which notes they were other than that fundamental, but it is difficult to produce more than one on a *Bursa* by overblowing to upper partials. The shell in his photograph is fairly small with quite a wide embouchure, and so again hand-stopping would seem to be the most likely way that they were produced.

Timkehet Teffera cites uses in southern Somalia, Kenya, and Tanzania, but with little detail.³ One side-blown *Bursa* conch in the Pitt Rivers Museum (no. B. IV. 89) is labelled as from Somalia, having been used as a war trumpet and that it was collected there between 1882 and 1890.

Jim de Vere Allen says that, “The aerophones of the Swahili include, among other instruments, various types of conch which are blown through a hole drilled near the point of the apex. They are widely used by sea travellers and other people. In the north-

²Graham Hyslop, *Musical Instruments of East Africa, I Kenya* (Nairobi: Nelson Africa, 1975), 38.

³Timkehet Teffera, *Aerophone im Instrumentarium der Völker Ostafrikas* (Berlin: Trafo, 2009), 419.

ern Swahili area [which used to include Somalia but seems today to be more or less limited to Kenya] there is a whole hierarchy of conchs which, beginning with the smallest instrument include the following forms: *gunda*, *idudi*, *chonthi*, *chundo*, *chundo dodi*. One blows them in general as a gesture of politeness when a dhow sails into the harbour and also on the open sea at certain established places and in different ritual and other contexts.”⁴ Unfortunately he does not give any species names nor does he tell us which rituals conchs may have been used for, nor what ‘the other contexts’ may have been.

Conchs are used also on the island of Madagascar. Sachs illustrates a triton (he says *C. variegata*) and, though it is difficult to see much past the player’s hand, I think a *Lobatus*, both of which were side-blown.⁵ *Charonia variegata* is, however, an Atlantic and Mediterranean species, and I suspect he may have mistaken it for the *Charonia nodifera* which as well as being the commonest Mediterranean shell, as we have seen, does also inhabit the Red Sea and the Indian Ocean down as far as the east coast of South Africa. He provides a good deal of information from the different tribal communities of the island, for the conch is used everywhere there, including that only men blow the conch and never the women. Among the Antandroy people

⁴In part of the Introduction of Gerhard Kubik, ed., *Ostafrika* (Musikgeschichte in Bildern I/10) (Leipzig: DVfM, 1982), 24.

⁵Curt Sachs, *Les Instruments de Musique de Madagascar* (Paris: Institut d’ethnologie, 1938), 10 and pl. V A and VI F.

of the south of that island, male and female shells (presumably of the same species) have different sizes and different sounds, Sachs saying that this is the only conception of the bisexuality of shells. In the same area, and among the other tribes there as well, he reports on signals of short and long calls, similar to those of whistles and wooden drums used by the same people. He says that these signals are for sending messages, announcing the arrival and departure of boats and ferries, calling assemblies, and that the conchs are also used in religious rites. He quotes Ellis:⁶ ‘A large company of singing women in front of whom stood three or four men blowing the turbo or trumpet shell, and making a kind of bass to the women’s soft and monotonous music in singing’, but that otherwise conchs are not used for entertainment.

Sachs says, too, that conchs are magical instruments in Madagascar, often sacred, used for burials, especially of princes, and in ancestor cults, and that in at least one tribe they are restricted in use, and there only for royalty. They are used during circumcisions, to cure illness through magical means by appeasing the anger of the spirits, and for funerals. Thus the shell has a dual role on the island, that of signalling and that of magic. Since Sachs’s book is essentially a catalogue of the Malagasy material in the Musée de l’Homme in Paris, he lists four examples

⁶W. Ellis, *Three Visits to Madagascar* (London: John Murray, 1858), 399.

from that collection, including a *Cassis cornuta* s 21×18 cm and a *Strombus* 19×13 cm with a suspension cord.

Linton reported the use of triton shells by the Tanala people in the Malagasy highlands, where they are called *antsiva*, which is also a general name for a trumpet on that island, and that these are imported from the east coast and are highly valued.⁷ They are used ceremonially, for funerals and sacrifices, and also for alarm signals and to summon the people for councils. He says that they are usually triton shells and quite small, often only four inches long, and that they are universal in Madagascar, not only among the Tanala.

The only African conch in my collection comes from Tanzania. This is a *Bursa* or frog shell from Mafia Island off the coast of Tanzania, opposite the Ufiji River delta. It was used by a boatman as a foghorn, and it is side blown with a rather irregular pecked embouchure at the back so that the open mouth faces forward, away from the player, unlike the Kenyan instruments. Thus hand-stopping on this instrument would be more difficult, though by no means impossible. The man I bought it from did not tell me whether hand-stopping was used or not.⁸ The shell

⁷Ralph Linton, 'The Tanala, a Hill Tribe of Madagascar', *Field Museum of Natural History, Anthropological Series*, 22 (1933): 268 and fig. 30e.

⁸It was bought from de Keller, who sold me a number of East African instruments. It is no. IV 102 in my collection, and its dimensions are OL 230: OW c. 150; OH 120; emb \varnothing 21.8×14.9; pitch d' 20+7♯ cents.



Figure 2-1: A side-blown *Bursa* conch from Tanzania, East Africa, perhaps used by ferry-men. Montagu Collection, IV 102.

is rather more delicate than the Fijian *Bursas* we shall meet in Chapter 5, but it is clearly a similar species.

This use of side-blown conchs, which otherwise are used only from the Pacific islands across into Indonesia, may quite possibly be due to Indonesian influence, for there are other musical and general connections between Indonesia and East Africa, most notably with Madagascar, where one encounters the bamboo tube zithers, called *valiha* in Madagascar, which are also found on some of the Indonesian islands.

Thus the use of conchs in East Africa is from the southern end of the Red Sea down to Madagascar, where it stops. Percival Kirby makes no mention of conchs in his book on South African instruments and cites only the use of a seaweed trumpet by fishermen, replaced in the mid-twentieth century by a horn of tinplate.⁹ He assured me in correspondence in the 1960s that there was no trace of any use of conch trumpets in South Africa.

The absence of evidence from Mozambique and Zimbabwe is also surprising, for Madagascar, where conchs are used, lies opposite their coasts. Here, perhaps, Linton's statement that the Tanala import their shells from the east coast may be indicative – it may be that conchs are absent from the Mozambique Channel that separates Madagascar from the coast of the African mainland.

⁹Percival Kirby. *The Musical Instruments of the Native Races of South Africa* (London: OUP, 1934), 80–82.

West Africa is another problem area. I was told by a friend, who had been on holiday there, that ‘large shells’ (but not which species, nor how ‘large’) were common on the beaches of the Gambia and that there were fishermen there, but once again we have no evidence of their use. The Yoruba people, and other peoples of Nigeria and of West Africa, have a sea-god, Olokun, and I have found one trace of the use of conch-blowing in his rites, but that was in New York, in a temple there; I could find no trace of this in Africa. Roger Blench also assures me that as far as he knows the conch is never blown in West Africa.¹⁰

The absence of evidence in South Africa is not so surprising, because it is mostly south of the area in which conchs are endemic, but West Africa is more surprising. There is a large population of conchs in the Atlantic and why they should be used on the western shores, especially throughout the Caribbean islands, and not on the eastern coasts, where the bulge of West Africa would fit quite neatly into the Gulf of Mexico and thus the West Indies, is very much a question.

The Persian Gulf

Travelling now further east, towards the Indian sub-continent, one Persian Gulf report that I have found comes from Iraq, where shells are used by the black population of Basra, principally

¹⁰Blench, by email, February 7, 2016.

by the older men to assemble the people of the quarter and invite them to participate in a ceremony.¹¹ So far as one can see through the player's hands in the illustration, the shell appears to be a *Bursa*.

The only reference I have for the Gulf States is a very brief note from Oman about fishermen's songs.¹² These songs are call and response, a solo line and a responding chorus, in which the author says: 'The rhythm is determined by the kind of work they are doing. This singing may be interrupted by short, sharp blows on a *barghūm* (horn) or a *yim* (*jim*) (conch)'. The entry for *jim* in that book says that suitable shells can be found all along the Omani coast and that they are end-blown and are used in various forms of sailors' dances and ceremonials. He lists various genera: *Strombus*, *Cymatium*, *Bursa*, and others. I think that we can take it from this that similar practices are probable throughout the Gulf States, and that possibly this might apply also to Saudi Arabia and the Yemen. However the use only by the black population in Iraq and the absence of conchs on the southern coast of the Mediterranean does suggest that there might be an Arab aversion to the use of conchs, and this might also account for the absence of any reports from the Red Sea.

¹¹Schéhérazade Qassim Hassan, *Les Instruments de Musique en Irak et leur rôle dans la société traditionnelle* (Paris: Mouton, 1980): 51 and pl. 22.

¹²Yūsuf Shawqī, *Dictionary of Traditional Music in Oman* (Wilhelmshaven: Florian Noetzel, 1994), 62.

This is a short chapter and it is one that emphasises again that, in all forms of world music, not only are we dependent upon published information, but also on what local and visiting investigators deem to be important and worthy of notice. I have many books in my library on the musics and musical traditions of geographical areas that do not appear in this book because the authors never mention a conch. They describe in detail the art musics, and indeed some of the folk musics, but such peripheral areas as signalling by seafarers, and minor local customs such as the above, may be felt to be beneath their notice.

The Conch in the Indian Sub-Continent

We come now to what seems to be the most widespread type of conch, one that is found wherever the Hindu and Buddhist religions are practised. The shell in figure 3-1 is a *Turbinella pyrum* (Linnæus) from India, called a *chank*.¹ This example is a small instrument, very well worn and it has clearly been much used. Worm holes have been stopped with plaster of Paris and the lip has been partly cut away to open the bell slightly to make a louder and higher-pitched sound. The ridges at the base of each whorl of the body have been emphasized with triple incised grooves, indicating that it was a ritual instrument.

Throughout this chapter, and indeed throughout this book, by 'India' I mean the whole sub-continent. With subjects like this, unless one has a specific source location, there is no way of knowing whether a specimen came from, or an older reference referred to, what is now the Republic of India, or Kashmir, Pakistan, or Bangladesh. While Muslims may predominate in the

¹Catalogue number VI 38; it was given to me by Dr John Waechter of the Archaeological Institute in London, who had bought it in India. The dimensions are OL 102.5; OW c. 65; OH 60; emb \varnothing 15.8; pitch around c'' (the C an octave above middle), somewhat unstable because some worm holes are still open.



Figure 3-1: A small Indian ritual *chank* (*Turbinella pyrum*). Montagu Collection, VI 38.

two latter nations, Hinduism and Buddhism are still practised there, just as Islam is still practised in India proper. Equally, ‘Tibet’ in this book also covers a number of the neighbouring states, simply because a Tibetan style of instrument may have come from Tibet proper or from one of the neighbouring states where Tibetan Buddhism is still established, and may there be more openly and safely practised. Inevitably, since the Chinese established their hegemony in Tibet, that form of Buddhism can only be studied safely beyond the borders of what is now a Chi-

nese province that is antagonistic towards any belief other than to its own form of Marxism.

T. pyrum is also the classic *chank* of the *Vedas*, the Hindu scriptures and legends. These were written in Sanskrit and date back to anywhere up to 1700 BCE, though they were not completed until around 500 BCE and even then are said never to have been written down, but always passed on by oral transmission, until around the first century BCE. While each of the heroes of the *Bhagavat-Gita*, one of the parts of the *Vedas*, has his own conch, each of different species according to Hornell, *T. pyrum* was the most important of them and was that of Vishnu and of his avatar Krishna.² Each hero's conch also had its own name as we shall see below, much as did the swords of the mediæval European heroes in the Arthurian Romances. In the *Vedas*, the conch was a war trumpet, and it is listed as such in a number of museum catalogues and books, sometimes with more detail. Curt Sachs said that a shell sucked away the blood of the giant that Parvati fought in the *Vedas* 'just as in ancient Greece Triton conquers the giants with a shell trumpet'.³ On the same page he also says that on the last day, when the world is in flames, Shiva, one of the three major deities of Hinduism, will sound the conch. He also notes that one of the friezes of the *stupa*

²James Hornell, *The Sacred Chank of India: A Monograph of the Indian Conch (Turbinella Pyrum)*, (Madras: Madras Fisheries Bulletin 7, 1914).

³Curt Sachs, *History of Musical Instruments* (New York: Norton, 1940), 156.

at Bharhut in Mysore province shows an ape blowing an end-blown conch with an added mouthpiece, and that worshippers of Vishnu paint a *chank* on their arms.

How much older may the use be of *T. pyrum* in India than the Vedas is unknown – legends attribute the creation of the world to its sound. Certainly, as far back as any records exist, it has been the sacred *chank* of India and Tibet in both Hindu and Buddhist ritual, and its use is an essential element in all Hindu religious rituals, including weddings, funerals and other life-cycle events. These conchs are blown continuously during boys' circumcision ceremonies, though one might suspect that this could be as much to drown the subject's cries of pain as for ritual reasons. They are also blown as part of the agricultural yearly round. While the *chank* is normally blown by men, especially on these occasions, women can and do blow it also. Nor are these uses reserved for Hindus and Buddhists, for some peoples of other religions also blow the *chank* on similar occasions; Hornell cites examples of non-Hindus blowing them to drive away devils from funeral rites.

When we look at a conch, we normally do so from the apex, so that the shell coils out clockwise (dextrally) from that point. Indians, however, look from the siphon at the bottom of the open bell and therefore to their eyes what we call a dextral shell is to them a left-handed one – the coil has reached the bell sinistrally or anticlockwise. What we call sinistral shells are rare but they do exist in many species. According to Hornell, sinistral *chanks*

came from just one bank off Madras, a city that is now known as Chennai, and because the Indians regard these as dextral, they were especially sacred. Those, Hornell says, were worth their weight in gold, and, for its size, *T. pyrum* is the heaviest of all shells. It was presumably their rarity that made them both important and valuable. Even the normally coiled shells are said by Hornell to be sufficiently sacred that if holy water should be required, a *chank* can be used to dip water from a bucket or any other source, and the touch of the shell renders the water holy.

These shells are widely distributed, nowadays, across the Buddhist world for ritual purposes, and a further indication of their value is the willingness of people to carry them, either themselves or on the backs of sheep or yaks, from Chennai, in southern India, all the way to Tibet, for until recent times there was no other practicable mode of traffic through the Himalayas and the other mountain ranges. They are to be found in every Buddhist temple around the world, especially in those countries in South-East and Eastern Asia where Buddhism is the main religion, or one of the officially recognised faiths. They are quite widespread also in Europe and America, for Buddhism is now one of the main world religions, as is Hinduism. They appear also in all those shops in Europe, America, and elsewhere that sell the appurtenances of exotic and mystical religions.

Like all horns around the world, they are also used in India for secular purposes: signals, warnings, alarms, and also by travelling mendicants who announce their arrival by calls on the

conch. India, more than most countries, is where the mendicant is considered holy and is regarded as entitled to food and generous support. They are also used on farms and plantations to summon workers.

Hornell relates that in Travancore, a state at the southern tip of India, in the days while it was still a kingdom within British India, their equivalent of the British maundy-money, golden coins called *tulabhāra kasu*, were specially minted in emulation of the British practice, and had a *chank* on one face of each coin; the monarch was weighed against the coins and these were then distributed among the priests and Brahmins, and he suggests that the image of the conch may be there because originally the kings may have been weighed against conchs! Maundy, or Holy Thursday, is the Thursday immediately before Easter, and commemorates Jesus washing the feet of his apostles; in Britain on that day in each year in one of our cathedrals, the Queen distributes to poor people specially minted coins, with a total face value equivalent to her age. This practise in Travancore was established in emulation of the British custom. Various mediaeval states of southern India, such as the Pandiyan and Chalukyan dynasties, also used the *chank*, always dextral (sinistral in our eyes), on their coinage.

Ground *chank* powder is, or was in Hornell's day, used as a medicine for a wide variety of problems, emphasising its magical and protective powers. For similar reasons, a *chank* would be buried in a shallow pit just inside the street door of a house.

This was marked with a white spot on the floor, and it was there as a protection from incursors, whether human or spirits. After any of the residents of the house had stepped out across it, just gently touching the spot with a foot, it would also protect them against any accidents and misfortunes that they might encounter beyond the home. *Chanks* were also blown to avert earthquakes and eclipses, and many people kept them in their homes for private worship.

Like most other conchs they are also fishermen's instruments, and the conch fishers use the inhabitants of the shell for food, though Hornell's reaction to this when he was offered some fried slices was that 'they tasted or rather smelled of frizzled shoe-leather and were altogether too tough for my teeth.'

They also have many commercial uses, one of the most frequent being for bangles, jewellery, and other decorative uses, and Hornell says that among the Nagas of Assam they were used as currency until the 1860s. Slaves and cattle were always valued there in *chanks*, equated then with one rupee, and a male slave was worth one cow and three *chanks*, whereas a female slave was worth up to three cows and four or five *chanks*. A cow cost ten *chanks* and a pig or a goat cost two. Ransoms of villages captured in war were also often paid in *chanks*.

Despite the widespread availability of these shells, I have been told in the past about finds of fragments of pottery copies of these shells, and there is also evidence, as yet unpublished, of the current manufacture of pottery shells in Vishnupur in

West Bengal and which have been traded mostly in Kolkata (Calcutta). Lars-Christian Koch of the Ethnological Museum in Berlin has sent me films of this process, quite clearly a long-established process, simply plying layer upon layer, following the natural shape of the shell from one end to the other. In his own laboratory he has been printing conchs, using CT-scans as basis for the computer programming. This might become a useful prospect for the future for conch-blowers, bearing in mind, as we say at the end of the last chapter of this book, that several varieties of conch are now protected species, and others may become so in future.

Returning now to the natural shell, it is the density and rigidity of its material, hence its weight, that makes the *chank*, *Turbinella pyrum*, the most trumpet-sounding of all conchs. Why this species should build up so much harder and heavier an exoskeleton than other species, I do not know, but for our purposes it suffices to know that it does. The acoustic result is that because, with any wind instrument, when some of the energy created by making a sound is dissipated by shaking the body of the instrument, there is less available to come out as sound. This principle applies to other instruments also, for the denser the material of the instrument, the stronger the sound; hence the use of gold, even of platinum, for the best transverse flutes in our orchestras, or at least for their head-joints, and hence the surprisingly strong sounds of some quite small pottery drums. This is why a pottery *darabukke*, the Near-Eastern goblet drum, will always

have a more resonant sound than a metal one, even if the metal instrument has a sharper or brighter tone. Experiments were conducted some 60 or so years ago in Britain to determine the best material for our modern B-flat trumpet bells. That which won the most votes on a blind test from behind a curtain turned out to be impractical – lead may be dense but it is so soft and so heavy that it would not be very useful as a trumpet bell!

The next figure (fig. 3-2), is also a *Turbinella pyrum* (Linnaeus), and although the shell itself of course is Indian, this one comes from Tibet, or from another area in that region where the Tibetan form of Tantric Buddhism can still be freely practised, in which such shells are an essential part of the monastic ritual ensemble.⁴ This *chank* is slightly smaller than the preceding shell shown at the beginning of this chapter, and the whole area above the main body whorl of the shell is encased in a cone of silver. Although Indian and Tibetan silver would not be recognised as such in Europe and America, because it often has a smaller proportion of silver than the legally specified standards here, it nevertheless seems better to refer to it as silver than as ‘white metal’ or some such rather derogative term, especially as in many countries there are sliding scales for the purity of silver, just as in Britain we recognise a sliding scale of gold with differ-

⁴It was bought on the Oxford open market on 24 April 2008, from Holly Brewer, who had brought it back from a region on the borders of Tibet. Its number is XIII 242, and its dimensions are OL 120; OW 55.8; OH 50; emb Ø int 10.3, ext 13; pitch e'' +20 cents.



Figure 3-2: Another small *chank* (*Turbinella pyrum*) from the Tibetan border areas, with the body encased in silver and with semi-precious stone, used in Buddhist ritual. Montagu Collection, XIII 242.

ent numbers of carats. Certainly in India and Tibet such metal is regarded as being silver and it would be somewhat insulting to call it anything else.

The silver has incised floral decoration and there are three inset studs that are probably of jade. The silver cone terminates with a small embouchure standing quite high above the top of

the shell within the case. A tube 16.2 mm long, presumably also of silver, but it is hard to see, leads down from the embouchure, at the top of the casing, to the shell inside, so that the player's breath is not dissipated into the hollow of the cone. The lip of the conch's bell has a silver sleeve that then forms a conically pointed cover over the bottom of the shell; this has one jade stud on the side and one at the point. All the rest of the body of the shell is encased in a matrix of malachite chips set in black wax, with, on the back of the shell, a roundel of carnelian chips into which a Buddhist monogram of Kalachakra, a powerful combination of ten syllables of the mantra of the Wheel of Time in an old Indian script called Lanca, is inset in silver letters.⁵

Larger shells in Tibet, where the shell is called *dung-dkar*, meaning 'shell-white', are often even more elaborately decorated, sometimes with a large added mouthpiece and with an elaborate extension to the lip of the bell, usually a large metal plaque attached to the shell with wax, which amplifies the sound and increases its directionality (fig. 3-3). This shell comes from Aurelia Hartenberger's collection, and I am grateful for her permission to use the photograph, and especially for providing measurements for it.⁶

⁵I am grateful to Martin Boord for deciphering and explaining this.

⁶OL 332.75; OW 247.18; emb \emptyset int 10.78; mouthpiece bottom int 8.52; mouthpiece interior cup flat bottom; pitch $c\sharp''$ +25 cents.



Figure 3-3: Tibetan *dung-dkar* or *Rag Gshong Ma* (*Turbinella pyrum*), with much added decoration. Aurelia Hartenberg Collection, used by her kind permission.

According to Mireille Hellfer, the conch would seem to have been the archetypal trumpet for Tibetans, because all their other forms of trumpet, such as those of human bone and the long metal Temple trumpets, incorporate the word *dung* in their names, adding another word to indicate that their material is of something other than shell, or to specify their use, or their size.⁷

Conchs, like the other instruments of the Tibetan monastery ensembles, are normally used in pairs, either blown in relay so that the sound is continuous when monks or acolytes lack the ability to use continuous breathing, or else are blown together as a pair. However much one may try to acquire pairs of shells of the same size, the pitch of a pair is seldom exactly the same, so that a beat can be heard when both are played; this also is common among other pairs of instruments in Tibetan use. The ‘beat’, a slowish vibration, is the difference of the number of Herz or vibrations per second between the two pitches. The faster the beats, the more out of tune the two are, and the slower the beats the nearer the pair are to a unison. A skilled blower can control the rate of beats, and so bring his conch into unison with that of his colleague by lip control, though he may prefer not to do so, for the beats are intended to add a quality to the sound.

⁷ Mireille Hellfer: *Mchod-rol; Les instruments de la musique tibétaine* (Paris: CNRS, 1994) 105–17.

An important use in the monasteries is to mark the hours of prayer. First, to warn the monks in the early morning to wake up, then again to dress and prepare themselves, and then to proceed to the temple, and similarly throughout the day. Calls vary in their content, normally a single note, though sometimes with a slight lip inflection to produce a marginally different pitch, or with either a loud start dwindling to a quieter one, or a medium start, swelling to a louder sound and then dwindling again, and so on. Hellfer's examples of Tibetan conch notation show a series of waves but her musical examples on the accompanying CD do not reveal this to be a matter of pitch nor of such regular undulation of volume, nor does she explain just what the notation does mean.

Returning to India, figure 3-4 shows a pair of *chank* shells.⁸ I bought these from Eaton's shell shop in the mid-1960s and sawed off the apex of each to form the embouchure, to use for demonstration at lectures. This was long before the days of the film *Alien*, for which I was asked to assemble a chromatic scale of conchs to represent, with a mix of other instruments such as serpents and alphorns, the sound of the Alien's voice – three of us, Christopher Monk, Alan Lumsden and I, were sequestered in a corner of the orchestra in a sound tent of our own, each

⁸III 70 a/b, whose dimensions are, for III 70a OL 172, OW c. 96, OH 88; emb \varnothing 16.5; pitch f_{\sharp}^{\prime} -40 cents, and for III 70b OL 187, OW c. 105, OH 92; emb \varnothing 16.4; pitch e^{\prime} -45 cents.



Figure 3-4: Two larger *Turbinella pyrum* shells, Krishna's conch 'Panchajanya', converted for blowing by the author. Montagu Collection, III 70a/b.

with our own microphone and a heap of alternative instruments, much to the entertainment of the rest of the band. I had acquired these two shells several years before Dr Waechter gave me the *chank* above (shown in figure 3-1) that was my first genuine example of this type. As will be seen from the dimensions these two are considerably larger than that shell, and they have a very strong sound.

I have another pair of much smaller, but genuine, *chanks* which are not illustrated, since they do not differ in any notable respect from the above, save for being slightly more slender as well as much smaller.⁹ A little of the tail of the smaller is broken off and there is a worm hole in the body whorl which does not reach the interior. Each produces an approximate c'', though one is a quartertone sharper than the other. They were bought as a pair to try to emulate the Indian player, recorded by Nazir Jairazbhoy in Bhuvaneshwar, who blew two much larger *chanks* simultaneously, using circular breathing, tonguing one shell while maintaining a held note on the other, varying the pitch, presumably by altering his lip tension on either shell at will, and overblowing one while retaining the drone pitch of the other.¹⁰ When he was complimented on this feat, he said that this was nothing, for his father could blow five! Professor Jairazbhoy very generously gave me many excerpts from his field recordings, long before he published them himself, to illustrate my lectures at London University, in Oxford, and elsewhere.

⁹I bought VII 116 a/b from an Indian shop in Islington. Their dimensions are, for VII 116a OL 115; OW c. 76; OH 63; emb \varnothing 14.9; pitch c'' +20 cents, and for VII 116b OL 116; OW c. 76; OH 62; emb \varnothing 16.2 \times 15.7; pitch c#'' -30 cents.

¹⁰Nazir Ali Jairazbhoy, *A Musical Journey Through India, 1963–1964* (Los Angeles: University of California Department of Ethnomusicology, 1988).

Circular breathing is employed by wind-instrument players all over the world, particularly on reed instruments, and, of those, especially on shawms, the ancient ancestors of our oboes. Instead of just blowing from the lungs and having to interrupt the sound while breathing in, the player alternates breath from the lungs by breathing in through the nose while simultaneously expelling air from the cheeks, so as to produce an unceasing flow of melody. Experienced players can keep this up for many minutes on end, perhaps even hours, though the longest I have heard was about half an hour. The technique is taught to aspiring players when they are young, often with a straw in a glass of water, so that they learn to keep the stream of bubbles rising continuously. This is not too difficult to do, though, through lack of practice, I have never managed to master it myself. The real skill lies in equalising the air pressure from the lungs, which are powered by the diaphragm, with that by the muscles of the cheeks, the difficulty being that the buccinator (‘trumpet-blower’) muscles that lie across the cheeks are naturally weaker than the strength of the diaphragm. Jairazbhoy had another recording from the same journey of a small boy, still at the learning stage and encountered on the road-side, but eager to show off his skills, whose notes on a reed-pipe had a distinct variation in pitch as he changed from lungs to cheeks, the lower pressure of the latter leading to a flattening of the pitch. His elder brother ran to tell Jairazbhoy that this was not the proper



Figure 3-5: *Turbo marmoratus* shell, Bhima’s conch ‘Paundra’, unsuccessfully converted for blowing by the author. Montagu Collection, I 10a.

way to do it and to show off his superior skill in keeping the pitch steady.

Hornell gives the names of the conch used by each of the heroes of the *Bhagavat-Gita*¹¹ The *Bhagavat-Gita* is part of the *Mahābhārata*, which in turn is part of the *Vedic* canon, dating originally from between the eighth and ninth centuries BCE

¹¹Hornell, op. cit., 199, quoting the *Bhagavat-Gita*: verses 11–19.

though probably not reaching its final form much before 400 BCE. It relates the wars of the Pandava brothers, initiated by a blast on the *chank* by Krishna, who as a Hindu deity is an avatar of Vishnu. Just as in the Greek legends of the immortals, and the Homeric narratives, which may be more familiar to us than those of the Hindu *Vedas*, the deities frequently interact with normal humans, and this is what is happening in the *Bhagavat-Gita*. While Krishna's normal musical symbol is the transverse flute, in warfare he replaces this with a conch, and his *chank* is named Panchajanya, and this is the species that we have been surveying, the *Turbinella pyrum*. Various sources assign different species to other names for the conchs of the Pandava brothers, for example the *Trochus niloticus* L. as Manipushpaka, blown by Sahadeva, and *Tibia fusus* (L.) as Sughosha, Nakula's conch, and *Turbo marmoratus* L. as Paundra, blown by Bhima. Bhima's conch is shown here as fig. 3-5.¹² This particular shell was certainly in England by the mid-nineteenth century for it had been cleaned and then engraved as a souvenir with the words 'The Great International Exhibition 1862 / Forget me Not', with a view of the extensive exhibition building.

¹²I 10a is a *Turbo marmoratus* Linnæus, dimensions OL 147; OW c. 156; OH 100; emb \varnothing 30.9 \times 28.9; pitch indeterminate – I broke off the tip rather too clumsily and the embouchure is too large and too sharp-edged to be effectively blown. I bought it in Aladdin's Cave, Croydon, a junk shop in which I found many instruments over regular visits spanning a number of years.



Figure 3-6: *Trochus niloticus* shell, Sahadeva's conch 'Manipushpaka', converted for blowing by the author. Montagu Collection, X 260.

Trochus niloticus Linnæus (fig. 3-6) was blown by Sahadeva, and, like the previous conch, my example has been cleaned to mother-of-pearl.¹³ I regret that these are the only examples of the *Vedic* heroes' shells that I possess and can show here, but

¹³X 260, *Trochus niloticus* L., whose dimensions are OL 70; OW 90; emb \varnothing 14.4×10.9; pitch b' +20 cents. It was bought from Raymond Man, a dealer in Chinese and Indian instruments, then in Covent Garden but now in Chalk Farm in London.

Tibia fusus L., Nakula's conch, is a very narrow, spindle-shaped shell which hardly looks to be practical as a blowing shell.

So how does all this fit in with Buddhism? Wars and warrior gods are not things that we associate with that faith. Buddhism has eight auspicious symbols (the Ashtamangala) and one of these is a white *chank*. This, in itself, represents the teachings of the Buddha and, also, the sound of the conch helps to spread these teachings around the world and to waken those, who persist in ignoring them, to turn to their importance and their values. One saying of the Buddha is that the life of the virtuous monk is perfectly clean, perfectly pure, and polished like a conch shell. In addition, Buddhism has taken into its faith various of the earlier Hindu legends and practices of the conch, the creation story for example, and also regards the conch as sacred for use in temples, monasteries and for all normal ritual and secular uses as above.

Sri Lanka (Ceylon) is a mainly Buddhist island and many of the above practices are applied there also, both the ritual ones and the secular, so that there is no necessity to repeat them here. The *chank* has appeared on early coins there, as we noted above for neighbouring areas in southern India, and it has also appeared on postage stamps in modern times.

We will now travel eastwards, following the early travels of Buddhism into South-East Asia and the Orient.

The Conch in South-East Asia and the Orient

The Indian *chank* has spread, along with Buddhism, throughout Asia, reaching as far north as Mongolia, whence Dalaimergen Tosontsengel has sent me a photo of his own shell, a typical *T. pyrum*, and where, he says, it is always used in pairs, one right-turned and one left-turned; it is called there either *dun* or *lavai*. Three of the conch *Hemifusus colosseus* (Lamarck), a Chinese shell of which more below, in the Copenhagen National Museum were brought back from Tibet, or more probably from Mongolia, by Sven Hedin's Central Asia Exhibition of 1939.

I have as yet no evidence for Burma (which is also called Myanmar), but it would be wholly improbable if conchs were not used in so Buddhist a country. Also, in one with so long a coastline, it is likely that fishermen used them as well.

Vietnam

The two references that I have for Vietnam are first that Trần Văn Khê states that while the *hai loa* (the maritime conch) took part in the 'grand music' of the nineteenth century, it is no longer

considered in our days as one of the instruments of music.¹ And second that Mahillon said that another *Hemifusus colosseus* (Lam.) in the Brussels museum came from what was then called Annam and is now Vietnam, where it was used by villagers to signal the end of work for the day, and also as an alarm in case of fire or night attack.² That shell has a metal rim, held with wax round the apex, to form the mouthpiece. Vietnam has a small proportion of Buddhists (though greater than any other non-indigenous faith), so it is probable that *T. pyrum* is also used there. It has also a long coastline on the South China Sea, the habitat of the *Hemifusus colosseus*, so that it would be likely that it is used by fishermen and other seafarers. However, the fairly typical (as we have seen elsewhere) attitude that the conch is not a ‘musical’ instrument, as evinced in the first sentence of this paragraph, means that we have no further information.

Thailand

In Thailand (which used to be called Siam), the only mention is by Dhanit Yupho, who says that ‘the Thai took the model for their *sǎng* from India and that they also regard it as magical and sacred. It is used only in ceremonies of the highest dignity,

¹Trần Văn Khê, *La Musique Vietnamiennne Traditionelle* (Paris: Presses Universitaires de France, 1962), 116.

²Mahillon, *Catalogue*, vol. III, no. 1861.

honour, and esteem, along with a horn and trumpet. It is not used in Thailand by beggars, nor for announcing temple ceremonies as it is in India'.³ His drawing shows a *T. pyrum* shell. He adds a story: "The old people have a saying which has come down to us from the old days which they use to ridicule self-righteous and arrogant people who, they feel, are not properly cognisant of their true 'place' in society: they say that those people are people who 'don't know their *sāng*'." Since the predominant religion in Thailand is Buddhism, we can assume that the conch, and judging from Dhanit Yupho's drawing, and probably the same *T. pyrum* shell, is likely to be used there, either real shells or, as we shall see immediately below, with pottery copies.

Thailand, like Vietnam, has a long sea coast, though in the Gulf of Thailand and partly on the Andaman Sea, rather than the South China Sea, not only in its central area near Bangkok, but also in a long peninsular (partly shared with Burma) running right down to the border with Malaysia.

Cambodia

The use of the *T. Pyrum* shell spread also into Cambodia (also known as Kampuchea) where again the main religion is Buddhism. Here, with fig. 4-1, we meet our next pottery skeuo-

³Dhanit Yupho, *Thai Musical Instruments*, transl. David Morton (Bangkok: Siva Phorn, 1960? – the date of Morton's preface), 85–6.



Figure 4-1: Pottery skeuomorph of a *Turbinella pyrum* conch from the Khmer culture of Kampuchea, 12th century AD. Montagu Collection, XIII 220.

morph, or imitation of a conch.⁴ We have met some skeuomorphs in Greece and in India, and we shall meet others below in Central and South America. This one comes from the

⁴XIII 220 came from Tony Bingham, who had bought it some 25 years ago in an antique shop in Bangkok, and in whose stock I had admired it for all of those years. It was bought from him by my sister Jennifer, who gave it to me as an 80th birthday present. Its dimensions are OL 211; OW c. 110; OH 103; emb \varnothing 6.8.

Khmer people of Kampuchea and it dates from the early to middle twelfth century.⁵ This is within the Angkor period, and conchs appear in the carvings on that great temple. The greenish-brown glaze on this 'shell' is partly worn away from the dark brown body. The shape is clearly based on that of the Indian *chank* or *T. pyrum*, with an added forked fish tail – one should remember that every natural shell was once inhabited by a marine snail-like creature, whose tail we can presume this represents. There is some incised decoration, looking like ///, at the bottom of each whorl of the shell, similar to that often seen on Indian *chanks*.

I have had this shell put through an hospital scanner, showing clearly that its internal structure is the same as that of a natural shell (fig. 4-2). In that scan we can see that the embouchure and the uppermost whorl are now obstructed, by what looks like compacted earth, and I am very reluctant to take a dental pick to something of this age, at least not until I have been able to consult an experienced conservator, also because the obstruction continues further down than one could reach with a pick, but primarily because I am anxious to avoid any risk of damaging so rare a shell. For that reason I have not tried to soak the stoppage and dissolve it in that way. Because of this stoppage, the conch cannot be sounded and its pitch cannot be established.

⁵Personal communications from Dr Dawn Rooney by email, February 2008.

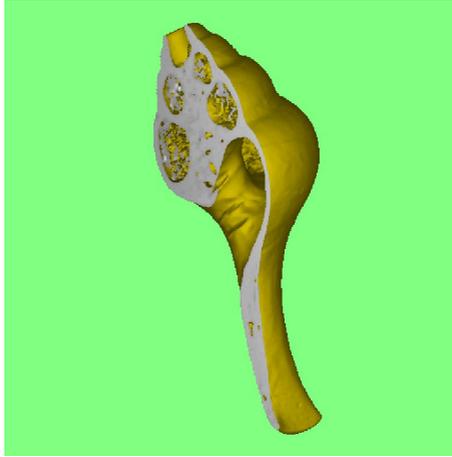


Figure 4-2: MRI scan of the same shell, showing the internal blockage.

According to Dr Rooney, most of the Khmer pottery conchs seem to come from Thailand or Kampuchea, the central areas of the Khmer culture rather than from the outlying parts.⁶ They have been found throughout the Khmer empire, and they were

⁶Dawn F. Rooney, *Khmer Ceramics* (Singapore: OUP, 1984); Dr Rooney has very generously made this book available as a pdf file on her website <http://rooneyarchive.net>.

used for all the normal purposes, such as signalling, certainly for music and equally certainly for royal processional occasions, and, exactly as in India, as lustral vessels in many rituals, both those of public ceremonial and those of the personal and family life-cycle. She says that when the king left the palace he was preceded by an orchestra with ‘bellowing conchs’ and that the Brahmins announced the king’s arrival by blowing conchs and that people then prostrated themselves and only arose when the sound of the conch stopped. She says, too, that many of these practices persist to the present day, and that conchs are still used in royal ceremonies conducted by the Brahmins, for which they are trimmed in gold and gems. These conchs are also part of traditional Thai weddings ceremonies, where they may or may not be banded in brass. Both large and small sizes are used. A typical use today is as a container for lustral water which is poured over the palms of the bridal couple.⁷ To what extent these conchs are of pottery, and to what extent natural shells are used, is unclear in her text.

So why are those shells, such as mine, made in pottery? One assumption is that it is because they are then ‘special’, because they were made by people rather than simply being picked up from a beach, or were imported from other countries, and therefore they are all the more effective in ritual. However, this assignation to ritual of anything that seems different from the norm

⁷Rooney, by email January 15, 2016.

and for which we have no other known reasons for their use, is a well-trodden path in archaeology, and it is one that is well-recognized for its dangers. Another possibility, she suggests, is that natural shells were not available in those early times, for the central Khmer area is some hundreds of miles from the sea, and the only sea coast is in the south-west area of the country, and there may have been difficulties inhibiting trade with coastal people. So I suspect that our best answer is the honest one: we don't know.

The practice of making pottery skeuomorphs of conchs is quite widespread. As well as the well-known examples from the Moche of Peru and those of ancient México, to which we shall come in chapter 6, they are found, as we have seen, in India, in ancient Greece and Minoan Crete, and they are also found in China in both the Tang and Song periods, and quite possibly elsewhere. None of these, save the Khmer, Moche and Mexican, have I seen myself nor laid hands on, so I do not know whether in Europe and in China they followed the full internal shape of a natural shell and were used for trumpeting, or whether they were just copies of the external form and used as vessels for libations and other purposes, as the stone ones were in Crete. In India, however, videos that have been kindly sent to me by Professor Lars-Christian Koch, mentioned in the previous chapter, show the internal form being built up, whorl by whorl, so these Indian skeuomorphs do indeed copy the natural shape.

China

Semifusus colosseus (Lamarck) shells seem to have been widely used in China, judging from examples that I have seen in museums. Their name seems to be variable: *Hemifusus* appears and so does *Pugilina (Semifusus) colosseus*; the general preference today seems to be for *Hemifusus colosseus* (Lamarck), and certainly this species can be found in Chinese waters. A. C. Moule says, giving it the name of *hai lo* which nowadays is spelled *hailuo*, that the small end of the shell is broken off to form a mouthpiece and that the shell is left just as it comes from the sea.⁸ Here I suspect he may have been wrong since most shells that have come 'straight from the sea' have a mantle of weed and other accumulation. On some shells, for example the *chank*, there is a brown skin looking like the bark of a tree, which is normally cleaned off before being used as a horn, and certainly the inhabitant needs to be removed and the interior of the shell cleaned out. All the Chinese shells of this species that I have seen were plain white shells. He says that naturally the size varies and averages from 12 to 14 inches in length.

These conchs were used by boatmen in Chekiang and around Shanghai and were normally white in colour, Moule said, while in the north, shells of various other shapes and colour are used

⁸A. C. Moule, "A List of the Musical and other Sound-Producing Instruments of the Chinese," *Journal of the North China Branch of the Royal Asiatic Society* 39 (1908): 98, (repr. Buren: Frits Knuf, 1989).

instead. He adds that conchs were said to be used also by the Buddhist sect called Ying Fo and by lamas. He gives no species names for any of these, but the white shells may be presumed to have been the *Hemifusus*, for I have seen a photograph of a Chinese conch clearly showing a *Hemifusus colosseus* and also another which looks like a *Charonia tritonis*, the Pacific shell, which perhaps is that of the north, for indeed that shell is a different shape and is coloured, and those used by the Buddhists and lamas may well have been the usual *T. Pyrum*.

Mahillon in his Brussels catalogues says that examples of the *Hemifusus* in that Museum were used for signalling by infantry soldiers and by night-watchmen.⁹ He says, too, that the Japanese conch of the same species (no. 738) was also used by soldiers. A third in Brussels (without a number) was said to have come from India and is painted with rings of red, blue, white, black, and pink – such colouring is more typical of southern India than the north. Another *Hemifusus* in the Pitt Rivers Museum in Oxford was brought back from the Malay States, now Malaysia.

Moule cites the early fourteenth-century encyclopedia *Wenxian tongkao* (Comprehensive Examination of Literature), which lists it among the Miscellanea and says that the conch was used by soldiers and also that it was used by the Nanman (‘southern

⁹Mahillon, *Catalogue*, vol. II (1896, repr. 1978): nos. 739 and 740.

barbarians'), the aboriginal peoples of southwest China, and for Buddhist music together with cymbals.

Yuan and Mao provide some useful information from early times to the present.¹⁰ They say that the *hailuo* is an aerophone used by the Tibetan, Mongolian, Han, Naxi, Dai, and Manchu peoples, etc. It is found in Tibet, Inner Mongolia, Qinghai, Yunnan, Sichuan, Gansu, etc., areas that are basically to the west side of China. They do not distinguish any of these references by their species, for *hailuo* is simply the general term for a conch. Images of the conch are found in the Dunhuang murals (cave 220) from the early Tang dynasty, in the seventh century CE, though Alan Thrasher puts the reliefs rather earlier, to the fifth century and the pre-Tang period.¹¹ Yuan and Mao also refer to a Song period text that identifies the conch as a Buddhist ritual instrument and they say, too, that it was also used in ancient times among the northern ethnic minorities in warfare, labour and entertainment. Now, they add, the conch found in Tibetan and Mongolian areas is only played intermittently when chanting scriptures, although originally it was an important instrument in the monastic orchestras. In recent times its place has largely been taken over by other aerophones. Apart from in the

¹⁰Yuan Bingchang and Mao Jizheng, eds. *Zhongguo shaoshu minzu yueqi zhi* (Musical instruments of China's ethnic minorities) (Beijing: Xin shijie chubanshe, 1986), 83.

¹¹Alan Thrasher, *Chinese Musical Instruments* (New York: OUP, 2000), 44–5.

monasteries, in the Tibetan Autonomous Region it is played in nunneries for rites for the dead. They provide two illustrations, one of a *C. tritonis* on their page 83, and among the many plates, one of a man blowing a *Hemifusus*.

This text, which is only in Chinese, was kindly translated for me by Professor Helen Rees, and in her own book on the Naxi peoples, also in western China, she says that two aerophones are also used by the *dongba* (indigenous Naxi priests): “the conch shell *fvl sse* (Chinese *hailuo hao*), and the yak horn *bberq ko* (Chinese *maoniu jiaohao*).... The conch shell and yak horn play single long notes. . . . Because supernatural powers are attributed to the instruments, there are strict rules as to when they may be played and which *dongba* may use them . . .”¹² She has also sent me, and kindly permitted me to use, her photograph (fig. 4-3) in which a young Naxi *dongba*, He Xiudong, is blowing a pair of conchs during the 2007 Smithsonian Folklife Festival.

Korea

The conch is known in Korea also, under the name of *na-gag* or *sora*. It was used there in the military band and it was end-blown. As in China, instruments are classed by their material: gourd

¹²Helen Rees, *Echoes of History: Naxi Music in Modern China* (New York: OUP, 2011), 56.



Figure 4-3: A young Naxi *dongba*, He Xiudong, blowing two *Turbinella pyrum* conchs during the 2007 Smithsonian Folklife Festival. Photo Helen Rees, used with her kind permission.

(e.g. mouthorgan), silk (string instruments with silk strings), bamboo (most flutes), and so on, with earth for pottery instruments such as the ocarina and, I suppose for lack of anywhere else to put them, conch trumpets – they do, after all, originate on the sea-bed. Chang Sa-hun illustrates an end-blown *Triton*

shell.¹³ Keith Howard cites Chang as saying that the *nagak* exhibited in Seoul (presumably the one illustrated by Chang) is 38 cm in length, 21 cm in diameter and produces the pitch B.¹⁴ Howard says that there is little historical information about the conch, though it was certainly present in the Koryō period (tenth century onwards), a time when Buddhism was predominant, and that in the fifteenth century, by which time Confucianism was more prevalent, the conch ‘was placed in front of dancers at the Rite to Royal Ancestors’.

Japan

In Japan, at least, we do know that conchs were and still are ritual instruments. Fukui Hajime gave us a great deal of information in 1994.¹⁵ Much of what he wrote was copied into Gunji and Johnson’s Dictionary.¹⁶ Fukui dates the introduction of the *horagai* (other names are used in different regions, but *horagai* is the main one) to Japan to the Nara Period (710–794) and

¹³Chang Sa-hun, *Korean Musical Instruments* (Seoul: National University, 1969 & 1976) in Korean with brief English summary), 295.

¹⁴Keith Howard, *Korean Musical Instruments* (Seoul: Se-Kwang, 1988), 36.

¹⁵Hajime Fukui, ‘The Hora (Conch Trumpet) of Japan’, *GJ* 47 (1994), 47–62 – in that Journal his name is given in the English way.

¹⁶Sumi Gunji and Henry Johnson, *A Dictionary of Traditional Japanese Musical Instruments from Prehistory to the Edo Period* (Tokyo: [Eideru Kenkyūjo], 2012).

the oldest surviving records are from the Nara Prefecture. He suggests that its use might have derived with Buddhism from China since there is as yet no earlier archaeological evidence for its use in Japan until the Nara Period. However, no conchs appear in the great catalogue of musical instruments in the Shôsôin of Nara, but that catalogue includes only what we might, to our own detriment, call 'musical instruments proper', especially those of court music, though it does include some whistling arrows. The species of shell used in Japan seems mainly to be and to have been *C. tritonis*, though we did meet a reference above to the use also of *Hemifusus* for military purposes. All Fukui's references are to its use in the esoteric forms of Buddhism. He says it might have been used in the Todaiji Temple in Nara, then the capital city, in 752. But he also says that the first records of its use are from the Heian Era (794–1185) and that one that had belonged to a certain saint who lived from 833 to 909 survives at the Hokakuji temple in Nara Province. While there are other sects of esoteric Buddhism, he lists the main one as the mountain-worshipping Shugendo sect and says that the *horagai* is 'a religious instrument that is said to make a man wise at the same time as it is used to accompany *sutra* chanting, give signals, and instruct on Shugendo.' The Buddhist scriptures say that the sound of the *hora* resembles the roar of a lion and will suppress the evil mind. Moreover, each part of the *hora* is compared with a mandala and the entire *hora* is the embodiment of the Samaya mandala. In these sects (there is a number of sub-

sects as we saw above), the *hora* is supposed to be revered and should always be carried when in religious training; it is kept in a network of string like a fishnet (mine, below, is missing its net). It should be blown for a holy fire, when arriving at and departing from a lodging, and when asking for guidance and replying. It is usually blown alone but sometimes in duet.

Fukui gives examples of notation in both the traditional form and in staff notation, with copies of the former above the latter so that one can see exactly what is going on. He uses the first four notes, fundamental and octave, fifth, and super-octave, and states firmly that hand-stopping is not used, though I was once shown that the *horagai* could be held by one hand, grasping the central *columella* side of the open mouth, so that the fingers could be moved within the bell. There is also some tradition that the shell could be used as a voice-changer.

William Waterhouse (a fellow-collector and friend who had a *horagai* with an original wooden mouthpiece) gave me a copy of the ritual notation from the Kamposan Temple School of Performance.¹⁷ Fukui gives the name of that temple as Kinpusenji, which is presumably more correct. This notation uses a three-line stave for low, middle, and high pitches, with movement from one note to another sometimes in straight diagonal lines but mostly with a curved line from low to middle, sometimes an immediate ascent, sometimes after a short horizontal low note,

¹⁷ *Gyōja Nichō* (Yoshimo, 1976), 20–21.

and with looped repetitions of middle to high, the loops looking, as it were, like *eeee*, with each *e* joined to the next, in groups of two, three, or five. Each group of calls is preceded and concluded by a longer horizontal and a straight diagonal upward from low to high. Waterhouse and I had assumed that hand-stopping was likely, for we took it to mean that the straight lines denoted a simple glissando and that the curved lines denote both upward and downward movement between the two notes, while the *eeee* seems likely to denote circular swooping, all of which can easily be achieved by moving the fingers. I have included this paragraph as a warning against trying to read our own suppositions into an unknown and foreign notation, a warning that could apply equally to notations in our own earlier musical history! It is also a salutary lesson for two long-term members of the Galpin Society (he was the Society's Archivist and I was and still am its President) against forgetting things that had appeared in our own journal, for there we would have seen just what these lines, curves, and curls really indicated.

Finally Fukui gives details of construction, including a detailed cross-section drawing of an interestingly-shaped cup mouthpiece set into the top of the added mouthpipe. The mouthpipe, held on to the end of the shell, usually with wax, is universal in Japan on the *horagai*, but while he takes the inserted cup mouthpiece as the norm, I can only say that my own example does not have one – it is just a plain copper tube, and nor do any others that I have seen, and nor does one in Aurelia Harten-



Figure 4-4: Japanese *horagai* (*Charonia tritonis*) conch, with a copper mouthpipe but missing its open-mesh network of silk cord. Montagu Collection, XI 44.

berger's collection, of which she has sent me a photograph and a detailed description; hers has a nicely shaped copper mouthpiece with a good rim and no internal shaping.

There is much more information in this article by Fukui than I have quoted, and it is a very important one – this, along with Hornell's book, are the only really detailed descriptions of conch trumpets and their uses that we have.

My own Japanese *horagai*, shown in fig. 4-4, is an end-blown *C. tritonis* (L).¹⁸ It has a mouthpiece made of plain copper sheet, soldered into a cylindrical tube with no thickening for the rim, fixed on to the end of the shell with thread and black wax. The shell is well-worn and its striations are well-marked. According to Mr Miyamoto, the Director of the Tokyo Drum Museum, to whom I showed it, this is the type of shell most desirable to the Japanese in its pattern and its markings. There is a hole drilled in the upper lip of the mouth for a suspension cord that is missing; this should be of reddish-brown silk cord, knotted into a loose, very open-mesh net, as described above by Fukui, and as I have seen on many other *horagai*.

Other *horagai* that I have seen have had mouthpipes of lacquered wood, and this is probably more normal on older ones than copper tube. Fukui describes mouthpieces of brass or sometimes stainless steel, which are then filled with shaved gypsum within which the cup of the mouthpiece is formed. He does not describe how the shape is stabilised in such material.

Mouthpieces or mouthpipes are rare on conchs. I have seen one of coarse pottery on a *Hemifusus colosseus* (Lamarck) conch which was said to be from the Philippines but thought more probably to be from New Zealand, referred to in the next chapter,

¹⁸XI 44 was bought from Tony Bingham. Its dimensions are OL c. 284; OW c. 120; mouth L 125; max W c. 63.5; mouthpipe L int 48–57 (the top of the shell is not cut off square); emb \varnothing int 19.5, ext 22.3; pitch e' -20 cents.

where again mouthpipes tend to be a norm, and they are also found in some other islands of Oceania that we shall encounter in the next chapter. Mouthpieces are common on the more elaborately decorated conchs from Tibet as we have seen, along with a complete casework of silver or other materials much more elaborate than on my XIII 242 (fig. 3-2) above and sometimes even more elaborate than that in Aurelia Hartenberger's conch in fig. 3-3. Pewter mouthpieces, resembling those of our trumpets or cornets, were used in Slovakia on the *Wetterhorn* which was described in Chapter 1, and we cited one example in Italy in that same chapter, and we shall meet some among the Maya in Chapter 6.

Other references to the *horagai* confirm the Buddhist use. William Malm told me that it was also used in folk ceremonies where both Buddhist and Shinto rites were being observed, and that in the Heian period it was used as a war trumpet.¹⁹ Tanabe wrote that the conch was used by the Yamabushi (again a mixture of Buddhist and Shinto) in their rituals and also when raiding, and especially when retiring into the mountains.²⁰

Gunji and Johnson also add that the *horagai* was used in ritual Buddhism to chase away beasts and venomous snakes before going into the mountains, and that in the Edo period it was

¹⁹Malm, in a letter in September 13, 1966.

²⁰Tanabe Hisao, *Nihon no gakki: Nihon gakki jiten* (Tōkyō: Sōshisha Shuppan, 1964), 321.

used in the folk performing art called *saimon bushi* and *kaizaimon*. Today it is also used in off-stage *kabuki* music as a sound effect for battle scenes.²¹

The Philippines

In the Philippines, according to José Maceda's distribution maps, conchs are quite widely used, mainly as one might expect, in coastal areas and on some of the smaller islands.²² The commonest name is *budyong*, though *taburi* and *lungga* appear in different language groups. He provides only one photograph, which shows what looks to be a *Cassis*, though much is hidden by the blower's hand; it is certainly end-blown. There is no reference to the instrument in his general text, and only one of his tables of places and instruments includes the conch and that has only the one name of *budyong*. This is for the Negritos, the oldest inhabitants of the islands. However, the distribution map on his pages 304 and 305 shows it on at least seven widely dispersed places among that archipelago.

²¹Gunji and Johnson, op. cit., 102.

²²José Maceda, *Gongs and Bamboo: a Panorama of Philippine Music Instruments* (Quezon: University of the Philippines Press, 1998).

Indonesia

Moving south into Indonesia, Kaudern wrote that the only conchs he had met or heard of on Sulawesi (which used to be known as Celebes) were side-blown *Charonia tritonis* shells.²³ He cites their use by the Poso Toradja, under the name of *ntoea-ntoeangi*, and that they were only allowed to blow it to warn neighbouring villages of danger or when the wood that had been cut down, to make way for fields, was about to be burnt, and that the notes of the *Triton* were believed to call the wind. He says, too, that on the coasts of Sulawesi 'it is customary to use a Triton trumpet on the boats to summon the wind spirits in case of calm'. He adds that 'In all specimens from the Malaysian Archipelago [his term for what is now Indonesia] that I have seen, the hole is lateral, which is also the case of these trumpets in the islands of the South Pacific.' The Poso Toradja people inhabit the northern side of the central body of the island, at the junction of the body with the arm that projects to the east and all their conchs were side-blown.

All of Jaap Kunst's mentions of the conch for the island of Java are only for the Hindu-Javanese periods, and he men-

²³Walter Kaudern, *Musical Instruments in Celebes* (Volume III of his *Ethnographical studies in Celebes*, 1917–1920) (Göteborg: Elanders, 1927), 265.

tions nothing from more modern times.²⁴ His references are all to the carvings on the great temple of Borobodhur and similar monuments, as are his illustrations, and the conchs there are all end-blown, deriving from the Indian use that we have already discussed. There is one brief exception, that some people in those periods enjoyed performances of drums with conch and a crooked trumpet. However, as noted above, Kaudern does say that ‘In all specimens from the Malayan Archipelago that I have seen, the hole is lateral’ which suggests that the side-blown conch is or was more widely distributed in Indonesia than in those earlier periods.

Andy McGraw has told me that in Bali the conch (*sungu*) is used in religious ceremonies and sometimes in contemporary compositions, primarily to evoke those ceremonies.²⁵ No particular pitches are aimed for in the latter – just casual notes. Balinese and Javanese musicians told him that the shells used are whatever is available locally.

Margaret Kartomi has informed me that she has encountered conchs among the Sea Peoples (the Suku Sekak ethnic group, one group of the Orang Suku Laut) who prefer to live on their houseboats at sea in the Bangka and Belitung Province off Sumatra’s east coast, who blow conch shells at sea for signalling.²⁶

²⁴ Jaap Kunst, *Music in Java* (The Hague: Martinus Nijhoff, 3rd enlarged edition, ed. Ernst Heins, 1973), indexed under ‘shell trumpets’.

²⁵ McGraw, by email, February 9, 2016.

²⁶ Kartomi, by email, January 13, 2016.

She also found conch shells such as the *Cassis cornuta* (Helmet shell) among the Orang Suku Laut in the Daik-Lingga area of the southwest Riau Islands, which lie between Sumatra and Borneo. Despite the shape of the shell, which has a very compressed spire, she says that it has ‘a blowing hole near its pyramidal end’, again evidence for side-blowing. She also provided a drawing of a side-blown *Triton*, called *tuang-tuang* in the Suku Kelumu dialect, Riau Islands Province. She adds “Sometimes a substitute for the conch shell is used. An example of this is a *betung buluh* (‘bamboo percussion instrument’) comprising an approximately 15 centimetre-long bamboo tube which is struck rhythmically with a wooden stick [to resonate the air column within]. However, the bamboo sounds do not carry as far over the water as blasts on the shell trumpets which are made by piercing out the player’s blowing hole near the pointed pyramid-shaped end. All the *tuang-tuang* in the Daik-Lingga area are made of shell, not bamboo tubing. Some exemplars are held in the Museum in Daik-Lingga.” So it would seem that in Sumatra the shells are usually side-blown (and later we shall meet undeniably side-blown *Cassis* shells), and that Kaudern here also is correct. It should be remembered also that in earlier times it was Java that was the most Hinduized of the Indonesian area, which is presumably why all the carvings of shells that Kunst encountered were end-blown.

Malaysia

Patricia Matusky Yamaguchi told me about a conch *kome*, or *trompet siput* ('*siput*' means 'snail') which is described as being made from the 'snail skin' (*kulit siput*) in the Music Museum in Kuala Lumpur, the capital of Malaysia.²⁷ It came from Semporna on the eastern coastline of Sabah in the Malaysian part of the island of Borneo. It is labelled as being used in former times as a means of communication for ritual and military purposes. She has sent me photographs of it which show that it is an end-blown *C. tritonis* with quite a wide and well-worn embouchure.

We now leave the land masses of Asia, first for New Guinea, one of the world's largest islands, next for one even larger, that of Australia, and then to the smaller islands scattered widely over the Pacific.

²⁷Matuski, by email February 8, 2016.

Oceania – The Islands of the Pacific

Oceania has traditionally been divided into three main sections: Melanesia, Micronesia, and Polynesia. If you look at the map (fig. 5-1) you will see New Guinea (and Australia) on the left, the western edge, and looking rightwards from there as far as Fiji to the east, there we have Melanesia. Going north of New Guinea towards the Philippines, from Palau to Kiribati is Micronesia, which has smaller islands and thus its name of ‘Micro’. And then from Fiji, which is on the borderline between Melanesia and Polynesia, over the rest of the Pacific from Hawaii in the north, to Easter Island in the east, and to New Zealand in the south, is Polynesia. While this is somewhat approximate, it is near enough for general purposes.

The origins of the various Oceanic peoples are mired in controversy, but it is accepted universally by all scholars that the first of them were the Melanesians. Their ancestors had migrated out of Africa with almost unimaginable journeys, though here again there is growing controversy, with suggestions that not all hominids originated in Africa, and that some species, even some of the oldest, may have begun elsewhere in the world. Those who became Austronesians and Melanesians may even

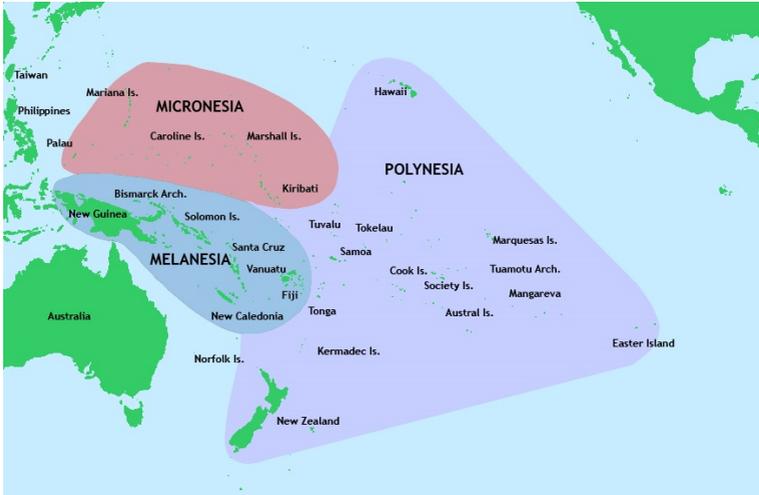


Figure 5-1: Map of Oceania, showing the cultural areas. Kindly made available for public use by Kahuroa.

have travelled via Siberia, where they may have intermingled with the Denisovians, a people related to the Neanderthals. They eventually reached New Guinea and Australia some 50,000 to 40,000 years ago when those two great islands were still one continent – marsupials appear in both, though developing on different lines once the sea had separated them, and didgeridus,

those wooden horns that are always regarded as Australian, also have relatives in New Guinea. How long it then took them to colonize the further islands of Melanesia is so far unknown.

It has been suggested that the Polynesian peoples, who all share some linguistic and cultural traits, derived from the Malay Archipelago and perhaps ultimately from Taiwan, whereas the Micronesians may perhaps have originated from the Philippines, but at present neither of these suggestions are certain; there are counter-suggestions in each case. Archaeology in the Pacific is still a recent discipline, as is human genetics, though both, especially the latter, are beginning to give us some answers. There is general agreement, though, that these islands were all settled far more recently than New Guinea and Australia, with Micronesia some little time after 2000 BCE, and Polynesia more recently, initially from perhaps 1400 BCE, and then, in each area, gradually from one island group to another. One thing that does seem to be certain is that all these peoples remained in a lithic culture, whether Neolithic or earlier, in the islands, because of a lack of metallic resources until the contact periods from Magellan's voyages in the early 1500s CE onwards. Why the Australian Aborigines also remained in a lithic culture despite all the resources of that continent, is unknown. Until recently, still within their own culture, they were sometimes making 'flint' tools from bottle glass and electric insulators, despite the fact that other individuals were adopting modernity. As a reason, one can only say 'cultural preference'.

How far back the conch goes in Oceania, nobody can tell. Since a conch with the end of its spire broken off, or a hole in its side could naturally be a trumpet, and since such shells are also washed up on any beach, already empty of their original molluscan inhabitant, and since again it is a natural action to blow through a potential container to clear it of water, having first perhaps washed it through to clear it of sand or mud, and since such blowing can inadvertently produce a trumpeted sound, the use of the conch, whether, as Sachs and others have suggested, initially as a voice changer, or always as a trumpet, could date back anywhere into the earliest of those periods.

The use of the Oceanic conch is widespread in all three groups of islands, Mela-, Micro- and Polynesia, and in all three it is most commonly side-blown. The species most often used is *Charonia tritonis* (L.), though *Cassis cornuta* L. is also used, with that shell being often end-blown due to the compacted shape of its spire. Another species is *Syrinx aruanus* L., often called the baler shell and said to be the largest of all conchs, although only a few seem to be larger than the largest tritons; these again are normally side-blown. The conch is a standard signal instrument worldwide, as we have already seen, for its sound carries well through forests and across hills and mountains, and like other sounds it carries particularly well across stretches of water, and, as in many other places, it is also blown in ceremonies of diverse kinds.

For Oceanian musical instruments in general, the standard source is still Hans Fischer's *Schallgeräte in Ozeanien: Bau und Spieltechnik – Verbreitung und Funktion*.¹ Fischer's bibliography is very comprehensive and is closely tied to his statements and to his figures. He gives much useful information, including a table which lists which islands use *Cassis* (end-blown) and which use *C. tritonis*, and whether these are end- or side-blown or both, and which have an added mouthpiece, and whether these may be a length of bamboo (Tahiti), gourd (Marquesas), or wood (Māori of New Zealand). He gives many examples of use, in addition to the normal signalling, from the literature he cites, such as the conch's powers of warding off evil, ghosts and spirits, bad weather, earthquakes, epidemics, eclipses, and also rain, which can be especially dangerous at sea, sometimes using a pair of shells with a pair of slit drums. In contrast with the common use against rain, on Easter Island conchs were used to bring rain. On many islands conchs were blown for pig-killing as we shall see below for Malekula. In Micronesia and Western Polynesia, shells, often a special one distinct from those used for normal purposes, were associated with gods, even representing the god, especially the war god, where it may be kept as a reli-

¹ 66–72 and figs. 466–86 for conch; transl. Philip W. Holzknacht and ed. Don Niles as *Sound-Producing Instruments in Oceania: Construction and Playing Technique – Distribution and Function* (Boroko: Institute of Papua New Guinea Studies, Revised edition, 1986, 135–49 for conch, figures as above.

gious symbol, stored in the cult house and blown by the priests as well as by the chief. In Samoa the conch might be hung in a net from the roof of the cult house and the god might blow it when he wished the people to make war. In Micronesia the conch was also used for house and boat building and for fertility magic, such as for yam planting.

Fischer also cites one unique use on Mangareva, an island in French Polynesia, in the Gambier Islands, which lie to the south of the Tuamotus, but which are related linguistically more closely to the Marquesas than to the Tuamotus. He quotes Hiloa as saying that there the shells are sucked rather than blown.² The only other examples that I know of for the sucked trumpet are the Siberian *byrgy* and the Chilean *noikin*, for which see my *Horns and Trumpets of the World*.³

We will now proceed, so far as we can, from island to island across the Pacific, starting with Australia, then Melanesia, followed by Micronesia, and winding up with Polynesia.

Australia

Australia is more a continent than an island. It is held by many authorities to stand on its own and to be distinguished anthropologically from Melanesia, and is therefore not to be considered

²Te Rangi Hiloa [aka Sir Peter H. Buck], *Ethnology of Mangareva*.

³p. 82.

part of any of the Oceanic groupings noted above, even though it lies immediately to the south of New Guinea, which is reckoned as Melanesia, as are the Torres Straits Islands. These islands lie between New Guinea and Australia, and they are now Australian territories as a province of Queensland, save for a few of the most northerly which are a part of Papua New Guinea. I have consulted several Australian ethnomusicologists and they are unanimous in saying that there seems to be no evidence for the use of the conch on the mainland of Australia, whereas conchs are used by those Torres Straits islanders who are Melanesians, like the peoples of New Guinea, unlike, as just stated, the Australian Aborigines, who are said to be of a different origin.

Melanesia

New Guinea

New Guinea is divided politically into two halves, and is the second largest island in the world (Greenland is the largest if we ignore Australia in that respect). The western half of New Guinea was part of the Dutch East Indies before the Second World War, and it is now part of Indonesia, consisting at present of Papua and West Papua provinces; there have recently been attempts by the inhabitants to secure independence from Indonesia. The eastern half of the island is Papua New Guinea, and this half was a German possession up to the First World War, but after

that it was governed by Australia, and it is now an independent nation. The conch is widely used in both halves of the island.

In Papua New Guinea, both Beaver and Chinnery emphasized that the conch signals are purely rhythmic, a series of longs and shorts on one pitch, in contrast, as we shall see, with practice in the Solomons and in Vanuatu, where hand-stopping is used and thus produces signals incorporating pitch as well as rhythmic variety. Beaver's article concerns wooden trumpets in the Highlands, but he emphasises that conchs are also used there, acquired from coastal areas by trade.⁴ He says that conchs used there are about 20 inches long and 9 inches wide, with a blowing hole about 3 inches from the apex. He gives some examples of the rhythms from the Binandere tribes of the Mambare and Gira rivers. When calling to go to and from a fight, signals were a long followed by a series of shorts; dancing in camp after killing in a fight, a series of alternate long and short, a call which is also used to call people from their gardens when a European or other strangers were arriving, in contrast with a half dozen of very long calls if a Government party was approaching; conveying news of a death an alternate short and a very long call; when bringing a pig long, short, longer.

⁴W. N. Beaver, 'A Further Note on the use of the Wooden Trumpet in Papua,' pp. 23ff.

Chinnery goes into more details.⁵ He says that the wooden trumpet is the native instrument of the bush peoples, and that in many of those tribes who have had friendly communication with the coast, the conch also is used. He adds that a short bamboo tube, either end-or side-blown, is used as an emergency substitute for the conch everywhere from the Dutch to the late German boundary. He gives similar but different examples of calls among different peoples to those that Beaver gave. For example alarms vary from three long and six short, or all short, or one long and all short; dancing from one long and then short to all long; announcing a death from two long and one short, or all long, or all very long, or one even longer; and successful hunting from two long to one long and then short. Chinnery also says that the signals are usually blown by men but that women may also blow the conchs. And he also gives us two legends from the Binandere tribe about the conch, stories that are too long to quote here, but, briefly, one of how the wonderful sound of a conch cured a family whose mouths and genital organs had been closed by a curse so that they were unable to eat or copulate, and the other of how the conch got the corrugated marks on its lip.

What is clear from both Beaver's and Chinnery's accounts of the conch signals is a) that these are purely monotonic with no pitch variation, and b) that these signals are local to each

⁵E. W. P. Chinnery, 'Further Notes on the Wooden Kipi Trumpet and Conch Shell by the Natives of Papua,' pp. 73–77.

individual tribe, and that other tribes may use the same signals for a different purpose, and each tribe may use different codes for the one purpose.

They both also reported, as we have seen, that for those tribes who live at a distance from the sea, trumpets of carved wood or bamboo were the norm instead of conchs, unless they were able to obtain conchs by trade or other means, and that these trumpets could be either side blown or, perhaps less often, end-blown. Figure 5-2 is one of these wooden trumpets from the Blackwater River area of Papua New Guinea, a very long way from the sea, and figure 5-3 is one of bamboo, this time end-blown, from the Asmat people of South Papua, in the Indonesian half of New Guinea that was Dutch in the days that Chinnery was there.

Seligman also reported the use of a wooden trumpet, instead of a shell, at the Government station at Cape Nelson to recall working parties at noon and in the evening, because, he said, those accustomed to blowing a conch can readily blow a wooden trumpet also.⁶

I have only two examples of shell trumpets from Melanesia. Both come from Papua New Guinea, one from the mainland, and the second from a nearby island group, the Trobriands.

⁶C. G. Seligman, 'New Guinea Trumpet', pp. 22-3.

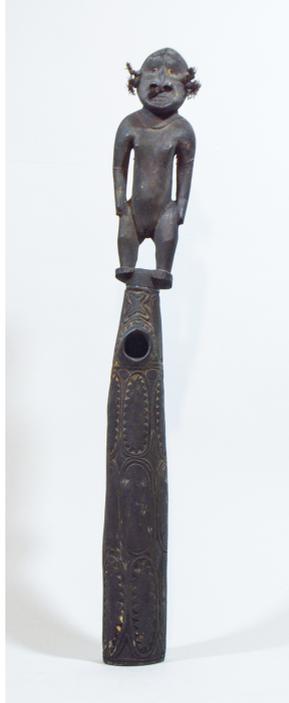


Figure 5-2: Side-blown wooden trumpet, surmounted by the figure of a young girl, from the Blackwater River area of Papua New Guinea; a conch substitute. Montagu Collection, IX 210.



Figure 5-3: End-blown bamboo trumpet with incised and stained decoration, Asmat People, Southern Papua, Indonesia; a conch substitute. Montagu Collection, V 4.

The mainland shell, fig. 5-4, is a side-blown conch, *Syrinx aruanus* Linnæus, also called a baler shell.⁷ On the majority of side-blown conchs the embouchure is on the same side as the bell opening, so that the open bell faces backwards, towards

⁷It was bought from Tony Bingham along with a number of other instruments from Papua New Guinea, but is not otherwise located. Its dimensions are OL 260; OW 120; OH 99; emb \varnothing 27.6×17.5; pitch e'+30 cents, and it is number XI 24 in my Catalogue.



Figure 5-4: Side-blown *Syrinx aruanus* conch from Papua New Guinea, showing the stain of much use. Montagu Collection, XI 24.

the player, where it can be easily reached for hand-stopping on those islands which use that technique, and on most others it is on the side opposite the bell opening, so that the bell faces forward. Here, however and much less commonly, the embouchure is at 90° to the bell-mouth, so that when the shell is blown right-handed, the open mouth of the bell faces upwards. That it is then not easily accessible to the hand is unimportant, presumably because, so far as we know from reports such as those noted above, the New Guinea signal codes blown on conchs

were rhythmic and not tonal, a series of long and short notes, variously grouped. The shell is heavily stained and has clearly been well used.

Don Niles of the Institute of Papua New Guinea Studies in Boroko has sent me some information about uses in PNG and in its smaller neighboring islands.⁸ The most usual species of conch used there are *C. tritonis*, which can be either side- or end-blown, and is by far the most common of the three that he lists; *Cassis cornuta*, which is there probably always end blown because of its very compact spire, is the next most frequently encountered; less often seen, he suggests, is *Syrinx aruanus*, the shell shown in the figure immediately above. He also included a photo of a side-blown *Tutufa bubo* L. The embouchures in his photographs look to be truly circular, and, after I commented on this, he replied that drilling the embouchure is the norm there. In his photographs the *Charonia* shells always have the embouchure on the same side as the open mouth of the bells (indeed one of his pictures shows a triton being hand-stopped), one *Syrinx* shell that he shows has the embouchure at the back, whereas mine above has it on one side. Another of his has a second hole in the next whorl down from the first; the upper hole would, like mine above, place the bell mouth upwards; the lower hole would put the bell forward. It is unlikely that the lower hole is a fingerhole – it is both too large for this and probably in the

⁸By email, 8 Feb 2016.

wrong position – for this practice seems to exist in Melanesia only in Fiji. It is more likely that, like a shell of mine from the Marquesas Islands, shown later in this chapter, that after it was first made, a later blower preferred a different position and drilled a second hole, and then the unwanted hole was stopped with wax. It is impossible to say which hole came first! One advantage of trumpeting is that irrespective of the position of the embouchure along the tube, the pitch produced remains the same, as experiment has shown. An embouchure too close to the bell leads to a deterioration of volume and tone quality, but does not affect the pitch; it is possible that this why my Marquesas conch had a second hole drilled, since both are on the same side, whereas it may have been either that or the desired bell position that influenced Niles's *Syrinx* shell.

He also reports some less common uses. In one area on the mainland, among the Kiwai of the Fly River delta, the conch can be used as a voice-changer, sung or spoken into. Sachs also mentions this: 'The king or chieftain always held a trumpet shell to his mouth when speaking to his people so that his voice had a very hollow sound.'⁹ Both Sachs and Niles cite Landtmann for this.¹⁰ Sachs notes this as a possible first use of the conch, followed by blowing, but whether Landtmann's chieftain held the open narrow end to his mouth, or the open bell, I do not know;

⁹Curt Sachs, *The History of Musical Instruments*, 48.

¹⁰Gunnar Landtmann, *The Kiwai Papuans of British New Guinea*, 402.

my guess would be the bell-end to produce the sound described unless a great deal of the apex had been removed, sufficiently to cover his whole mouth, as with our megaphones; it is difficult to pronounce a number of consonants while speaking into a normal size of embouchure. Niles also says that in the inland mountainous area of Nokopo in the Madang province, the shell has a different function: it is referred to as 'the old man' and is kept hidden.

But the most unusual use noted by Niles was by a Lutheran missionary, Heinrich Zahn, to form a band of conchs, each of a different pitch, and to train members of his congregation to play hymns and other suitable tunes in two- and four-part ensembles.¹¹

Zahn did this by using a numerical cipher notation, with each differently-pitched conch marked with its number, and thus with the players blowing in turn, as their number came up on the notation, just like our handbell ringers or a Russian horn band. He had taught the locals to sing European hymns and other tunes by using his numerical system combined with sol-fa terms, and had also applied the same systems to some local tunes. He had also built up a chromatic scale of shells, using different sizes of shell and where necessary fine-tuning these with some added putty at the sides of the bell mouth. He also

¹¹Heinrich Zahn, *Mission and Music: Jabêm Traditional Music and the Development of Lutheran Hymnody*.

used hand-stopping when necessary, and whenever the intonation of the singing was poor, he replaced the voices with the shells to teach the singers more accurate intervals. Zahn and his shell band gave concerts in other local places, also, to much acclaim, even attracting tourist parties from places that were several hours of travel away. He later acquired some brass band instruments from Bavaria, though it seems unclear how he managed to combine these, which were in E flat and B flat, with his conchs, which were based in D – perhaps because although they were notated in D the actual pitches may have been different, or perhaps by renumbering the shells, which were a chromatic set. He also recorded a number of the hymns and other tunes on cylinders, as well as other local music, for the Berlin Phonogrammarchiv.¹²

Niles also records the history of these bands, for others were formed in the same district in emulation of Zahn's initial success, in an article for *The World of Music*, and chronicles their use up to the present day, for the bands continued after Zahn's return to Germany in 1932.¹³ A hymnal with 130 cipher notations of different hymns and other tunes for the band was published in 1934, and, after a period during World War 2, when the bands had to stop playing, a further hymnal, with more English hymns

¹²Zahn, op. cit., Niles's introduction pp. lxx-lxxxii.

¹³Don Niles, 'The Conchshell Band as Preserver of German and Papua New Guinean Lutheran Traditions', 53–68.

and other tunes, was published in 1959 and is still in use today. As well as *Triton* shells, *Pleuroploca filamentosa* (aka *Filifusus filamentosus* (Röding)), and *Tutufa bubo*, all side blown, and some end-blown *Cassis cornuta* are in use today. I have devoted this much space to Zahn's conch band because other than the Tongan conch ensembles, for which see below, this use of conchs seems to be unique.

One further use is the portrayal of a shell, sometimes a *Cassis* and sometimes a *Triton*, on the flag of West New Britain Province, the next island to the east. That province, Niles told me, also hosts an annual festival called the Tavor Festival. *Tavor* or its cognates is the word for 'conch' in a number of local (particularly Austronesian) languages.

And finally for the mainland, a conch in the Pitt Rivers Museum, Oxford (1939.52) is a *Cassis* from Collingwood Bay, on the northern coast of the south-eastern promontory of PNG, which was used by boys to accompany dancing.

As noted above, the Trobriand Islands are also a part of Papua New Guinea, and our next example, fig. 5-5, is a side-blown conch, *Charonia tritonis* (Linnæus), from the Trobriands, which are an archipelago north of the easternmost tip of Papua New Guinea.¹⁴ The embouchure is circular, very neatly made, and it is well worn, showing that the conch has been much used.

¹⁴It also was bought from Tony Bingham. Its dimensions are OL 265; OW c. 130; OH 110; emb \varnothing 18.3×16.9; pitch e' -30 cents, and its number is IX 212.



Figure 5-5: Side-blown *Charonia tritonis* conch from the Trobriand Islands of Papua New Guinea. Montagu Collection, IX 212.

There is a small natural hole in the back of the main body whorl, and closing this with the thumb stabilizes the pitch but does not affect its level. The very end of the spire is broken off, but not far enough down to open that end of the air column.

North of the Trobriands is the Bismarck Archipelago, which includes New Ireland. Sachs tells us that in certain islands conchs are kept away from men, and that in New Ireland, conchs,

played by women are blown when a first pregnancy is celebrated, and are also used to accompany women's dances.¹⁵

Although Bougainville is the northernmost of the Solomon Islands, it is nevertheless an autonomous region of Papua New Guinea. A conch from there in the Pitt Rivers Museum, collected by Beatrice Blackwood in Kurtatchi village, is a side-blown *C. tritonis* that was blown during ceremonial journeys.

Solomon Islands

The rest of the Solomon Islands, a double chain of islands to the east of New Guinea and also a part of Melanesia, is an independent nation. The sea between the two chains of these islands was notorious during the Second World War as 'The Slot' and it was the scene of many naval actions. Dr J. F. Peake, then of the British Museum of Natural History, showed me a *Cassis* which was used for religious services by the saltwater people of Langa Langa Lagoon on Malaita, one of the Solomon Islands.¹⁶ It was those people, who live on small artificial islands built up on sandbars, who used to make the shell money that was used as currency throughout the Solomons. That money was made from smaller shells than conchs, with a disc cut from a shell, drilled and strung on cords and used also as necklaces, bracelets and

¹⁵op. cit. p. 50.

¹⁶In conversation when I was visiting that museum many years ago.

even earrings. There are many parts of the world where one carried, and often still carries, one's wealth as personal adornment.

Dr. Peake also told me of a *Cassis* used on another of the Solomon islands, Santa Isabel, the longest of the Solomons and the next island to the north of Malaita, where he heard it blown while being hand-stopped to obtain additional pitches. This technique was certainly used in Malekula and, as we have seen in one of Don Niles's photographs of Papua New Guinea that at least sometimes it was used there, as it was in Heinrich Zahn's bands, and also on Santa Isabel, and probably elsewhere, but here, as so often in anthropological studies, we are limited to reported practice. Some field workers are interested in such matters, and some are not, and so while some provide such information, others do not. There is still a great deal to learn about how and why instruments are used; we see them in museums, but once in a showcase they are dumb and unless the collector has told us of their use we can never know of it. This is why, having seen many other conchs from all parts of New Guinea, and the Solomons, they are not listed here, for there is little point in doing so unless I know how, and for what purposes, they were used. For other island chains here, I do list at least one shell, whether or not I know its use, simply as evidence that they were used on that island.

Vanuata

Vanuatu, which used to be called the New Hebrides when it was a French and English condominium, is another of the Melanesian island groups, and one island in that group is Malekula. Raymond Clausen taught me the codes used on Malekula for the Maki ceremony, one of which is a series of slow trills played by moving the hand in and out of the bell, which I blew at his wedding because we were old friends and colleagues. I regret that I cannot remember all the others, for this was back in the 1960s, but one other was a long stopped note followed by a short upper note produced by removing the hand. These signals are used to denote the quality of the tushes of the boars that are killed for the meals that are part of the Maki ceremony. The more times the tush is coiled, the more valuable is the pig. As well as other such codes, he recorded two conch blowers on the reef one day, deliberately hand-stopping so as to elicit difference tones between the pitches of the two conchs to make the whole reef resonate in sympathy.¹⁷ He told me that it was quite clear that they were doing this deliberately, carefully tuning their conchs by hand-stopping until they got the pitches precisely in tune to

¹⁷These difference tones are also called resultants. If two players sound notes a fifth apart, exactly in tune, such as the second and third partials, then the difference between them, the fundamental ($3-2=1$), will also sound, as will some summation tones such as the fifth partial ($3+2=5$), though this might be too high to resonate the reef.

produce the difference tones, and that they knew exactly what they were doing. After his death, all his fieldwork notes and recordings were given to the Pitt Rivers Museum by his widow, Tandy, and two of his conch recordings can be heard on the museum's website.¹⁸

Difference tones are produced by sounding two exactly in-tune overtones, normally of equal loudness. For example, if the fourth and sixth partials are blown, a second partial can be heard, an octave below the fourth, probably also with a summation tone of the tenth partial. Composers in our culture have taken advantage for this, for example in Weber's *Concertino for Horn*, where the player has to produce chords by playing one note and humming another partial, and similarly in Ethel Smythe's less-often heard *Concerto for Violin and Horn*. It is also a common bandroom trick for other players as well as for horn players.

Another use on Malekula, reported by Deacon, was that a conch was tied to the hand, usually the left hand, of ancestral figures.¹⁹ As a man rose through the ceremonial ranks of the local society, at each stage he would break a shell against the forehead of a pig – the last shell that he used in this way was the one that was tied to his figure.

¹⁸ <http://web.prm.ox.ac.uk/reel2real/index.php/collections-clausen.html>

¹⁹ Arthur Bernard Deacon, *Malekula, a vanishing people in the New Hebrides*, 546,

New Caledonia

The southernmost islands of Melanesia are New Caledonia. Raymond Ammann has sent me some notes from his book on New Caledonia of the uses of the conch there and on the Loyalty Islands, which are part of that group.²⁰

The only conch used there today is *C. tritonis*. He watched one being made at Poindimié on the north-east coast of Grande Terre, the main island of New Caledonia. The shell is found on the beach, already empty of its inhabitant. It is always side blown and the embouchure is formed by boring the hole with a pointed-ended kitchen knife (presumably in earlier times a pointed stone; I doubt that a bone would be strong enough against a shell, though the more solid part of the spire of another shell might be adequate). The maker tries it from time as he works ('he' because they are only made and used by men there) until he gets the size right for his mouth and for the best sound. In the local language, Kanak, the names used for the conch are onomatopoeic such as *tutu* or *cucu*. Only a single note is produced on the conch – they are neither overblown to an upper partial nor are they ever hand-stopped as they are in Vanuatu. He quotes Maurice Leenhardt's book *Notes d'ethnologie néo-*

²⁰By email February 8, 2016; an excerpt from his *Danses et Musiques Kanak, Une présentation des danses et des musiques mélanésiennes de Nouvelle-Calédonie, dans les cérémonies et dans la vie quotidienne, du XVI-IIe siècle à nos jours*, 35–38.

calédonienne (Paris: Institut d'ethnologie, 1930.) as saying that the conch was used to announce the arrival and departure of ships and boats and also to call people together for meetings. The most frequent current use then was to signal church services. It was also used to announce the death of a chief and mourners blew conchs to announce their arrival for the funeral. Leenhardt also records the use of the conch at different stages in yam cultivation, for instance at the end of one season and at the beginning of the new one, and also in the human life cycle, in birth, death, initiation and other ceremonies. Conchs also had a symbolic function – chieftains would arrange an assembly of them, mounted one above another on a palm tree at one end of the main street of a village – I can count at least twenty triton shells, arranged in a spiral around the trunk, in a photograph that Ammann has sent me. These, Leenhardt says, are never blown but represent the 'glory of the clan', and also the giving of life to the yams and thus to the people as fertility symbols.

Ammann, who also worked in Malekula, added a note by Tom Harrisson that on that island messages used to be sent by conch across the valleys: "They use a sort of morse code, making a long blow and then a short one, and so on, each of the various blasts meaning something different, such as 'I'm coming over today' or 'Look out, there's trouble blowing up with the village of Telag'."²¹ By Ammann's time there, slit drums

²¹Tom Harrisson, *Living Among Cannibals*, 73.

had taken over the message-sending role and the conchs were used in the rituals described above.

Fiji

Fiji is at the easternmost end of Melanesia and it is one of the few island groups in Oceania where end-blown conchs, other than the *Cassis*, are used as well as the side-blown *C. tritonis*. The end-blown shells are *Bursa bubo* Linnæus, nowadays called *Tutufa bubo* L. Nomenclature of this species of shell seems to be confused and sometimes contradictory, though their common name is uniformly frog shells. Whether *Bursa lampas* Linnæus and *Bursa bubo* L. are distinct species or whether both terms are synonyms for the same *Tutufa* shell is by no means clear in the online literature under those names that I have accessed. All sources seem to agree that their habitat stretches from the Red Sea and eastern Africa, where we have already met them, to at least as far as Fiji and perhaps further.

On Viti Levu (the main island of the Fijian archipelago) they differ from the *Tritons* in one major respect: they have a finger-hole drilled in the parietal wall (what one might call the thick side of the bell terminal whorl) within the bell mouth. There seems to be no preserved record of how or why this hole was used, save that one report states that it was covered and opened by a finger and thus undoubtedly was a fingerhole.



Figure 5-6: End blown *Tutufa bursa* shell with a fingerhole in parietal wall, Fijian style, converted for blowing and fingerhole drilled by the author. Montagu Collection, I 8a.

Figure 5-6 shows one of these shells, one that I converted from a raw shell after I had been researching many Fijian conchs of this type in museums, because I had been unable to obtain an original. I sawed off the narrow end and drilled a fingerhole. Genuine instruments of this type have a loop-handle made of human hair and sennet (woven coconut fibre) attached through a small hole drilled in the end of the bell.²²

I had become interested in these shell trumpets with a fingerhole, the only such conchs that I knew of in those days, after meeting Karl Erik Larsson, then of the Göteborg Ethnographic Museum, who is the main source of information for this section, and who gave me a copy of his book on the shells.²³ Of the 40 shells that he had studied, all but one of the *T. bubo* shells seemed to have come from the island of Viti Levu, these mainly from the highlands of that island, and very little was known of their use. Some were said to have been used as war trumpets but most, judging by being found at temple sites, were thought to have been ritual instruments. One report from 1890 cited by

²²I 8a is one of a trio bought from Eaton's shell shop, a well-known source for shells of all sorts, then in an alley just off Charing Cross Road in London. Its dimensions are OL 175; OW c. 150; OH 106; emb \varnothing 23×20.7; pitch f' -40 cents, fingerhole pitch g' +20 cents, 260 cents higher (a small minor third). The second (I 8b) was also converted for blowing but without a fingerhole: OL 210; OW c. 150; OH 122; emb \varnothing 20×19; pitch eb', and the third was left raw.

²³Karl Erik Larsson, 'The Conch Shells of Fiji', 119-47.

Larsson tells of two large shells, called *ndavui*, which were hung by their sennet loops (and therefore presumably *Tutufa* shells) at the entrance to the temple. According to the local chief, one was a god and the other a goddess, each of them a war divinity. The chief claimed he had heard them exchanging angry words and that on the evening before ‘an important event’ the shells had become uneasy. They climbed the poles from which they were hung and travelled along the ridgepole inside the house. When the warriors went to war they blew these shells, which terrified the enemy.²⁴ Another report that Larsson cites, from 1839 near Rewa, tells of a visit to a temple courtyard where a number of shells were assembled which the local priest said fought among themselves; the more powerful got above the weaker and vanquished them, along with other similar reports. There are reports also of shells being blown to invoke the gods, for circumcision rites held when a local chief has died, to avert droughts, for fertility rites, to waken a god who, turning in his sleep, had caused an earthquake, to stop a flood, to announce the death of a chief, when turtle fishing, and of course always for war. But never in any of the many reports that Larsson cites, save that one mentioned above saying that a finger is placed over the hole and moved to change the sound, is there any mention of two pitches being heard – if that happened, as surely it must have, the occur-

²⁴ A. J. Webb, *Observations on the hill tribes of Navitelevu, Fiji*, 624ff.

rence was of no interest to the missionary or other visitor who heard it.

Regrettably, the first missionaries on Fiji firmly extirpated all indigenous religious observance, as undesirable pagan practices, without making any records of that observance, so that we do not know how and why they were used. Some missionaries were interested in the peoples' religious practices, especially the Roman Catholics (the Vatican published a major anthropological journal for many years, the *Annali Lateranensis*), but other varieties of Christian missionaries had no interest in the ways of the heathen, and their main aim was to eradicate all traces of such practices, whereas the Roman Catholic procedure was more often inclined to Christianise practices that were familiar to the people and thus more smoothly convert them to Christian belief.

Why these shells, and only these shells, and only in Fiji, had a fingerhole that would raise the pitch by opening it, whereas hand-stopping, used elsewhere in Oceania, lowers the pitch by occluding the bell, is unknown. I have blown ten of these conchs in various museums, in the days when such a practice was still permitted to researchers, and the rise in pitch varied from 232 to 360 cents, with an average of 316.1 cents, exactly that of a natu-

ral minor third.²⁵ It was noteworthy that while the embouchure differed quite considerably in diameter from one example to another, depending on how far down the terminal spire had been removed, all the fingerholes were close in diameter to 9 mm, showing that this amount of pitch rise (for that depends on the area of the open hole) was deliberately sought.

Triton shells are also used all over the Fijian archipelago, but with two exceptions all are side-blown. One of those end-blown exceptions, in the Peabody Museum at Harvard University, has both a fingerhole and the sennet loop, otherwise found only with the *Tutufa* shells. The other is in the Auckland Museum, and there is one side-blown triton with a fingerhole in the South Australian Museum in Adelaide.

Curt Sachs suggested that these uses, of side-blown *C. tritonis* and of end-blown *T. bubo*, on the one island group, was due to a fusion between two cultures, one side-blowing and one end-blowing, two different immigrant traditions, two waves of incursion by different peoples, but this can only be speculation. However, it is equally possible that this is a dichotomy within the one culture since the *Tutufa* shells have mainly been found archaeologically at temple and cult sites whereas *Tritons* are still widely used, and thus that the division between the end-blown

²⁵The equal-tempered minor third on our pianos is 300 cents but the natural minor third, from the 5th partial (E on a fundamental of C) to the 6th (G), is 316 cents.

Tutufas and the side-blown *Tritons* might have been between ritual and secular. It would, perhaps, also explain why *Tutufas* have a fingerhole and *Tritons* do not, since ritual may have required a pitch rise whereas secular signalling may have not desired this. A possible reason for the difference between the two species in the position of the blowing hole is that it is easy to place a side hole on the smooth surface of a triton, but difficult to find a flat enough area for one in the very knobbly *Tutufa* shell (though we have seen side-blown *Tutufas* in East Africa), but then this would not explain why one has a fingerhole and the other does not.

Micronesia

Caroline Islands

Anapauo on Fefan Island, the third largest in the Chuuk archipelago, which is the central group of the Caroline Islands, was where the centre of a Free-Church Mission of Congregationalist and Methodist stations was set up by Robert Logan and his wife Mary in 1884, with Alfred Snelling following him as the missionary in 1888. When Snelling died in 1905 after his boat had drifted for 51 days before coming to land, having been caught in a storm at sea while visiting sub-stations on other islands, his widow returned to Penryn in California, bringing with her, among other things, the conch which had been blown on the



Figure 5-7: Side-blown *Cassis cornuta* conch, used by Alfred Snelling to call people to church at Anapauo on Fefan Island in the Carolines. Photo Nancy Thym, his great-niece, used by her kind permission.

mission to call the natives to church services. Their great-niece, Nancy Thym, has sent me a photograph of that shell, fig. 5-7, which she has kindly allowed me to reproduce, along with the information above and below.²⁶ What is important about this shell is that it is a *Cassis cornuta* and that it is clearly side blown – the embouchure, which one can see has been well used, is in

²⁶In several emails on 4 and 14 January, and 21 February 2016.

the last whorl before the open bell. I and many others have said that the spire of the *Cassis* is so compact that it could not ever have been side blown, but here is the concrete evidence that indeed it could have been and that indeed it was.

Nothing else is known about this shell, save that ‘it was used to summon the Islanders to church’, according to a label associated with it in the glass case in which it was kept, and although there is a book that was compiled from Snelling’s diaries, nothing is said about it there, nor is there anything much about local customs other than references to ‘the poor heathens’. However, Brian Diettrich has told me that generally in Micronesia the conch is an instrument associated with ‘magic’ and spiritual practices and for speciality practices such as navigation and voyaging, and that it is sometimes referred to in Chuuk as the ‘mouth of the land’.²⁷ He has also referred me to a photograph of a *Triton* from Palau, an archipelago lying between the Philippines and the Carolines at the western edge of Micronesia. This conch is side blown and the photo shows it with the shell held upwards, the bell towards the sky and the body of the shell against the blower’s nose, the only time I have seen such a playing position. It is on the cover of a CD of *Wax Cylinder Recordings From Palau, Micronesia (1909 / 1936)* published by the Berlin Phonogrammarchiv.

²⁷By email February 19, 2016.

Diettrich published an article in the *Galpin Society Journal* on music in Pohnpei (previously known as Ponape) in 2011, the main island of the eastern-most island group of the Carolines.²⁸ A table there lists conchs as being, or having been, used on every island of Micronesia, though Diettrich warns that ‘due to cultural abandonments’ some instruments are no longer in use by that date or are rarely found. However, on Pohnpei at least the conch was then still used under the name of *sewi*, and he illustrates a pair of blowers, each with a side-blown shell, one of which is certainly a *Triton*. The *sewi* was associated with chiefs and the shells themselves were given proper names and were still treated with respect, including the properly respectful manner of how to hold them when blowing. There is a suggestion, too, that the blowers were given honorific titles. The *sewi* were used to send messages, and he quotes a source from 1899 saying ‘I firmly believe that between village and village is a regular code of signal-calls almost as effective as our telephone.’²⁹ Diettrich gives several examples of purely rhythmic signals (he has assured me that hand-stopping is never used in Micronesia), with slow continuous sounds for a visit by a ruling chieftain, short continuous sounds for the installation of a new chieftain or the death of an old one, three or four long calls to

²⁸Brian Diettrich, ‘“Keeper of the Drum”: Silent Objects and Musical Past of Pohnpei, Micronesia’, 219–42.

²⁹F. W. Christian, *The Caroline Islands: Travel in the Sea of Little Lands*, 138.

call a meeting or to call people for church, several short quick sounds for the arrival of food or kava, and so on.³⁰ There are also less specific signals for celebrating the first immersion of nets, boats, or canoes, announcing a large catch of fish, and from older times at the beginning and the end of a battle. Diettrich tells me that little of these uses survive today, but that they are still remembered by older men.

Polynesia

Tonga

The last major group of Pacific islands is Polynesia, where we start with Tonga, an island group near enough to Fiji that there have been suggestions of cultural contacts between the two, especially between Tonga and the Lau islands of Fiji. Indeed Richard Moyle says specifically that the *lali* (slit drum) and the *kele'a* (conch) both came to Tonga from Fiji.³¹ He quotes what is presumably a periodical (*Lo'au* 1(2):6, October 1959), which is not listed in his bibliography, as saying: ‘Another blown thing

³⁰These and the following are mostly derived from C. R. Kim Bailey’s MA thesis ‘Traditional Ponapeian Music: Classification and Description’, University of Hawai‘i at Manoa (1978), which Diettrich quotes.

³¹Richard Moyle, *Tongan Music*, conch 95–101. This section of the book is an expansion of his article ‘Conch Ensembles: Tonga’s Unique Contribution to Polynesian Organology’.

is the conch ... obtained from Fiji. It was used in the announcement of an embarkation, and for shark-noosing or fishing.³² Moyle says also that while both *C. tritonis* and *Cassis cornuta* were found in Tongan waters, only *C. tritonis* was used as a blowing shell there.

As always, the conch was used for warfare, as well as for those purposes above. It was used, too, for first-fruit ceremonies, while searching for lost fishermen, and during self-mutilation relating to funerals. It is still used today while fishing and for announcements of all sorts. It has also a unique musical use. When beating on drums, firing guns, and waving flags were prohibited at cricket matches in 1880, only the conch was allowed to be used, and this was in groups of two to nine of different sizes. Moyle has no doubt that this use of conch ensembles pre-dates the introduction of cricket, for although there are no references to this in earlier sources, one source does say that they were used for recreation, usually in three sizes, ‘producing a minor chord in the Tongan scale’. The conchs were blown before matches and also during the match to sustain the excitement.

In Moyle’s time there, this was confined to the three northern islands, with the best on Niuatoputapu island, but such performances in earlier days had used to take place throughout the Tongan archipelago. When there were three or four different

³²Lo’au was a god of education and therefore that is the name of the Tongan University.

sizes, each would play his own part, but if there were two of almost the same size, then the higher-pitched would tune down to the lower by hand-stopping. Moyle provides several transcriptions from his own recordings, with the lowest producing more sustained notes, the middle size, regarded as the melody shell, blowing more complex rhythms, and the upper similarly to the lowest but in syncopation with it. His most complex example has five shells, two of which are in unison, with a range of pitches from the F below middle C, the D above, two on the F above, one of them blowing only sustained notes, and the highest on A, again playing sustained notes. His simplest examples have only two conchs, but even then, playing is always in syncopation.

Samoa

In the Samoan islands, in contrast, the conch, *pū*, is simply a signal instrument, blown for a curfew, church meetings, evening prayer, and as usual for fishing. Moyle says that both *C. tritonis* and *Cassis cornuta* are used, the triton side-blown whereas the *Cassis* is end-blown.³³ In older, pre-Christian times, some shells were sacred, representing the voice of a god. They were also used for weddings, funerals, kava ceremonies and, as always, as a war trumpet.

³³Richard Moyle, *Traditional Samoan Music*, 47–8.

Hawai‘i

Moving now to the most northern islands of Polynesia, in Hawai‘i the use of the conch is endemic for ceremonials, both royal and political, and for religious occasions, especially weddings, and also for boats that are signalling for permission to come ashore. Both *Tritons* and *Cassis* are used, and both are end-blown. Helen Roberts said that she had never encountered a side-blown one anywhere in those islands.³⁴ One photograph from the Bernice Bishop Museum shows a man blowing with one hand in the bell, a practice that we have met in some Melanesian islands but that seems only to have been reported in Tonga elsewhere in Polynesia.³⁵

Marquesas Islands

At the eastern extremity of Polynesia we reach French Polynesia, of which the Marquesas Islands are the most northern. From these islands I have one shell, a side-blown *Charonia tritonis* (fig. 5-8) which is unusual in having had two side embouchures, the upper of which was filed with wax in the past, presumably because it was too near the apex to produce a good sound, and which I have filled again.³⁶ It was with this shell that Raymond

³⁴Helen Roberts, *Ancient Hawaiian Music*, 45–6.

³⁵Paul Collaer, *Ozeanian*, Abb. 177, p. 211.

³⁶The vendor was again Eaton’s Shell Shop, and it is the only blowing conch that I ever found there. It is no. III 68 and its dimensions are OL 330:



Figure 5-8: Side-blown *Charonia tritonis* conch from the Marquesas Islands, with two blowing holes, one filled with wax. Montagu Collection, III 68.

Clausen taught me the Malekulan codes, for it was then the only side-blown triton that I possessed. It is only in French Polynesia, so far as I know for side-blown shells, in the Marquesas, Austral, and the Tuamotus islands groups, that side-blown tritons have a mouthpiece added in or around the embouchure. Of the two

OW c. 188; OH 133; emb \varnothing 27.8; pitch $b\sharp +20$ cents, a semitone below middle C.

from the Marquesas group that are illustrated by Collaer,³⁷ one is a drawing by Emille Lasalle where the mouthpiece looks like a gourd, and the other in the Musée de l'Homme in Paris, looks as though it may be built up by wax, or possibly again a segment of gourd.³⁸

According to Ferndon, conchs were the principal trumpets on the Marquesas islands, though he cites Etienne Marchand, writing at the end of the eighteenth century, that there was a bamboo form 'on Tahuata that consisted of a bamboo tube to which was fastened, at an acute angle, a smaller bamboo that probably served as a mouthpiece.'³⁹ The conch species mentioned are *Strombus lambis*, L. (now *Lambis lambis*, L., the spider shell) and *Murex tritonis* (apparently an older type name for *C. tritonis*), the former with a calabash tube attached as a mouthpiece, and the latter with a candlenut shell attached. The shells were decorated with coconut fibre cord and braided or bunched strands of human hair. On the islands of Nukuhiva and Uapou the conchs were used only for war but on Tahuata they were used also for religious ceremonies, including human sacrifices, and as invitations to funerals and other feasts. They were also used there just for fun, such as enjoying the echoes in the mountains, and perhaps also as identifications when going from one

³⁷Collaer, Paul

³⁸Collaer, *Ozeanien*, the former p. 210, the latter Abb. 178.

³⁹Edwin N. Ferndon, *Early Observations of Marquesan Culture, 1595–1813*, 63ff.

valley to another. They were also used as welcomes for special feasts, and, for example, the construction of a new festival court or plaza, along with drums.⁴⁰

Tuamotu Islands

The central island group of French Polynesia is the Tuamotus of which Tahiti is the largest. Elsdon Best shows a drawing from there by Edge-Partington of a side-blown triton with a long reed mouthpiece inserted into the embouchure.⁴¹ The shell is 11 inches long and the reed 19 inches, and the drawing was presumably made from the example in the Dominion Museum in Wellington. Best quotes a more detailed description by William Ellis, an early nineteenth missionary in Polynesia: “In order to facilitate the blowing of this trumpet, they made a perforation, about an inch in diameter, near the apex of the shell. Into this they inserted a bamboo cane, about three feet in length, which was secured by binding it to the shell with fine braid; the aperture was rendered air-tight by cementing the outsides of it with a resinous gum from the breadfruit tree ... The sound is extremely loud, but the most monotonous and dismal that it is possible to imagine.” Best adds a further unattributed quotation: When Cook lay off Tubuai isle in August, 1777, some natives approached the vessel in a canoe: “One of them kept blowing

⁴⁰Ferndon, *op. cit.*, 85.

⁴¹Elsdon Best, *Games and Pastimes of the Maori*, 289.

a large conch shell, to which a reed, nearly two feet long, was fixed; at first with a continued tone of the same kind, but he afterwards converted it into a kind of musical instrument perpetually repeating two or three notes with the same strength.” Thus the added reed provided sufficient length to produce at least some overtones, for which I have found no other reference in Polynesia – in all other reports, where anything is said about the sound, they specify only a single pitch. Tubuai is one of the Austral islands, to the south of Tahiti, and also in French Polynesia.

Mangarev

South of the Tuamotus is Mangareva, the largest of the Gambier islands, and also part of French Polynesia. A side-blown *Triton* in the Pitt Rivers Museum from the village of Rikitea on that island was said to have been still in use in 1922 for signalling from boats to the shore.

New Zealand

Finally for Polynesia we go to the far south, to New Zealand where conchs, called *pūtātara* or *pūmoana*, (fig. 5-9) are end blown and normally have an elaborate mouthpiece, usually of carved wood, bound to the end of the conch by strips of reed or leaf. One, which was thought to be probably of New Zealand origin in the British Museum of Natural History, has a pottery



Figure 5-9: End-blown *Charonia lampas rubicunda* conch, with added wooden mouthpiece and tassel of pukeko feathers, Māori people, New Zealand. Aurelia Hartenberger Collection, used by her kind permission.

mouthpiece. At what stage pottery was adopted in New Zealand I do not know, nor was I given a date for the shell by the museum, but it has been alleged that pottery was a post-European introduction. The usual shell in New Zealand is a *Triton*, though these are fairly rare, depending on being washed up dead on North Island, for New Zealand is south of the normal range of these shells. Also used are the rather larger *Charonia lampas rubicunda* shells, which are commoner in those latitudes.

That these New Zealand mouthpieces are long-established, we have evidence from Elsdon Best again.⁴² He quotes Monneron's *Journal of De Surville's Voyage* in 1770 (published in McNab's *Historical Records of New Zealand*, Vol. 2): "We saw amongst the New Zealanders some musical instruments; one is made of shell, to which is adjusted a round tube 3 in. or 4 in. long; they draw from it sounds similar to those of the bagpipes".

As on many other islands in the Pacific, the use of the conch and other instruments declined in the twentieth century, but in New Zealand the Māori people and other enthusiasts have revived many of them and are making them again. One of the leaders in this has been Brian Flintoff who has made modern copies of the smaller traditional instruments, including the *pūtātara*.⁴³ Flintoff illustrates one such shell, now in the Cambridge

⁴²Best, op. cit. p. 290.

⁴³Brian Flintoff, *Taonga Pūoro: Singing Treasures, The Musical Instruments of the Māori*, 47–51.

Museum of Archaeology and Anthropology that was collected in James Cook's voyage of 1769–71. He says that the conchs were used for signalling and to call assemblies. Other sources have noted them as war trumpets and as used by watchmen at night.

The mouthpieces vary in length, from two or three inches to nearly a foot long, the average seeming to be four to six inches (10–15 cm). Because these are mouthpieces they form part of the sound chain so that, depending on their length, the basic pitch can vary quite considerably. Flintoff says that the sound can be varied by using a ball or hand in the bell, but we have no evidence for that being done in earlier times, so perhaps this is a modern development of playing technique. Whether the mouthpieces were traditionally bored as tubes, or whether like the *pūtōrino* (another of the recently revived ancient Māori trumpets, a number of which were collected by Captain Cook and are now in various museums), they were and are carved in two pieces and glued together along the sides and bound round with lashings of twine, is unclear, but Flintoff's instructions for making a *pūtātara* says firmly that the mouthpiece is bored.⁴⁴

There are many more islands, and even island groups, in the Pacific than have been mentioned here, but this is, as in other chapters, due to the lack of existing sources, and probably also my lack of success in finding sources that do exist. For the same

⁴⁴Flintoff, *op. cit.* 106.

reasons, there is often here a lack of any detail of how and when the conch was used. But one thing that this chapter does make apparent is that there can be few if any islands in the Pacific Ocean in which shells are not, or in the past have not, been blown as trumpets, that they were most commonly used for warfare or to summon people together, and that while other species are also used, the vast majority are and have been *C. tritonis*.

The Americas

So far as Northern America (Canada and the northern parts of the United States) is concerned, the presence of conchs is chiefly a matter of transmission from place to place, because much of those countries lies to the north of waters warm enough for those conchs that are big enough for blowing as trumpets. The northern habitat limit on the western coast seems to be the Gulf of California, and on the eastern side the waters off Florida and the Gulf of México, so it is not surprising to find only limited pre-Columbian evidence in those northern parts.

There is no evidence at all in the Americas for side-blowing with conchs, not even in Brazil where some wooden and bamboo trumpets are side-blown – all conchs are end-blown.

We do know of two cultures, from which conch trumpets have been found, and that existed earlier than the sixteenth century. Each of these had links with one of those two northern limits. One is the Hohokam that was based mainly in California and Arizona, and which also had contacts with the Méxican cultural area. That culture seems to have arisen around 1 CE and it continued until around 1450. The other is the mound builders of the Hopewell Tradition, more a network of trading areas than

a culture, which seems to date mainly from 200 BCE to 500 CE, and which stretches from Ontario and Québec down to Florida, thus giving access, via the Mississippi, to both of those eastern conch habitats, Florida and the Gulf of México.

The Hohokam lived in pueblos and the Hopewell built mounds, and so both were very obvious targets for archaeology. What else there may be under the ground in less conspicuous circumstances we do not know, simply for lack of archaeology over so huge a territory. Archaeologists look for visible remains and dig there; on the whole, they do not just put a spade in the earth at random. Few of the native North American cultures built in stone, to leave visible remains, nor do they seem to have built earthen hill forts, as people did in Europe. Mostly they were nomadic, leaving little visible trace, and there is the further problem of their sacred areas which naturally they do not wish to be disturbed, as we have recently seen with the resistance against them being desecrated by oil pipelines. I do not know whether either Canada or the USA have the regulations that we have in Britain that any building work, including roadworks, must be reported to the local authorities if any early evidence is found, and thus the archaeological resources alerted and the works delayed to allow for investigation.

The later native peoples of North America, those of the Great Plains and the West, who were encountered by the settlers from the seventeenth through the nineteenth centuries, seem on the whole not to have been trumpeters. I have been unable to trace

any evidence for the use of bison horns for that purpose, and since I have never handled a horn of that species I do not even know whether buffalo horns are suitable for trumpeting, though I suspect that their hollow interiors may have been rather too short for such use. Nor have I encountered any evidence for the use of any other material, such as coiled bark or wood, as trumpets.

A further problem in the search for evidence is the lack of recognition, at least by the earlier archaeologists who have found conchs in their excavations of those two earlier cultures, the Hohokam and the Mound Builders, that shells that have had their terminal spire removed, might have been trumpets; it seems simply not to have occurred to them that they might be musical. One early report of mound digging in Illinois, cited by Henry Boekelman, said that numerous *Busycon perversum* (L.) shells (aka *Sinistrofulgur perversum* (L.)), native to the Mexican Gulf) had been found and that ‘it is worthy of note that the crowns or tops of the shells are missing...indicating that [they were] made to serve some useful purpose in the economy of this strange people.’¹ This was in 1877 and it may be hoped that things are better today, but even in the mid-1930s Boekelman was still getting shells for identification that had not been recognised by the senders as probable musical instruments. His

¹Henry J. Boekelman, ‘Shell Trumpets from Arizona’, *American Antiquity* 2:1 (1936), 27–31.

article describes and illustrates a *Lobatus galeatus* (Swainson), the apex of which had been ground down to blow it. This had been found in a Snaketown ruin of the Hohokam culture, 48 miles from Phoenix, Arizona, but with no more detailed archaeological context. The *L. galeatus* is described as an eastern Pacific shell, found from California to Peru; this one was clearly a dead (fossil) shell that must have been found on a beach.

Some authorities date Snaketown from 300 BCE to 1200 CE, and regard it as a central Hohokam settlement, though others suggest that the inhabitants in the earlier part of that range were a different people and that the Hohokam only moved there around 500 CE. There is, though, a consensus for a peak between 700 and 900. Boekelman notes six shells from this area, the earliest finds being both a *Lobatus galeatus* and a *Melongena patula* (Philippi) which has a similar habitat, which were found in the Tusayan Pueblos (now a part of Grand Canyon National Park) in 1896, and he adds that similar shells were still at that date being blown to represent the roar of the Great Plumed Serpent. He also cites another author as saying that such shells were also still being used by the Zuñi people for the same purpose, ‘making it appear that the serpent is keeping up a continuous roaring.’ He mentions also a *Hexaplex nigrinus* (Philippi) (aka *Murex nigrinus* (Philippi)) with the apex removed from the Waputki Pueblo near Flagstaff, Arizona.

We have reports of shells being found in excavations of mound burials from the Hopewell tradition in Ohio and as far

north as mounds in Ontario of Canada or even beyond.² The use of such shells seems to have continued in at least some of these areas into more recent times also, though reports are spasmodic. Boekelman cites one from 1761 among the Delaware tribes of Pennsylvania where it was blown to call people to prayer, and an undated *Lobatus gigas* (Linnæus) (aka *Strombus gigas* (L.)) from Tuscarora township in Ontario to call people to the long house.

He also mentions the much later use of shells by the European immigrants in New England, and on mid-west farms, western cattle-ranches, and southern plantations, as dinner horns, to call workers to meals, and indeed I bought one that had been used for that purpose in Iowa, some 1500 miles from the sea (fig. 6-1).

This is a *Lobatus gigas* (Linnæus), the Caribbean and West Indies species, which has clearly been very well used, for the marks of the saw that cut off the apex have been almost worn away by the player's lips, and shell is a very hard material. It was cut off a little higher than usual and the embouchure is quite small as a result.³ The shell was probably long dead and washed up on a beach before it was made into a blowing shell, for it

²P. T. Furst, 'West Mexico, The Caribbean and Northern South America', *Antropologica* 14 (June 1965), 1-37, specifically 26-7.

³Its number in my collection is V 76. It was bought in an antique shop in Belle Plaine, Iowa. Its dimensions are OL 235; OW 206; OH 125; emb \varnothing 13.4 \times 10.1; pitch d' -20 cents.



Figure 6-1: End-blown *Lobatus gigas* conch, used to call the farm hands in for meals near Belle Plaine, Iowa. Montagu Collection, V 76.

is white in colour from dissolved lime, with none of the original colour visible – as noted above, shells in this state are often called fossil shells. I was told by the vendor that it had been used for many years on a farm near Belle Plaine to call the hands to dinner. As so often, buying objects at secondhand is frustrating. It would be fascinating to know how it got to Iowa: was it bought from some traveller to that area, or did the original settlers there in Iowa bring it with them from the East Coast, and if so had they been fishermen or whalers before deciding to farm

in the Mid-West? So many instruments in every collection have hidden histories that will never be revealed, though in this case we do at least know how it was used in its new home.

Central America

In Central America, south of the Rio Grande, and in the northern parts of South America, trumpets of shells are, as one would expect, much more common, both in antiquity and to the present day, as Peter T. Furst and later authors make plain, for this is all within the central area of a large conch habitat. Circular reasoning suggests that because shells were easily available locally, therefore the cultures concerned became trumpeting peoples, unlike most of those further north, but this is the chicken and the egg reasoning. Which came first, the desire to use trumpets or the availability of suitable shells? Of course we can never know, but on the whole humanity tends to make good use of whatever resources it finds, and signalling of some sort is an ever-present need, as are the further demands of ritual and warfare.

It is, however, difficult to establish the use of conchs in the different cultural periods of the Central American area which covers modern México, Guatemala, El Salvador, Honduras, and Nicaragua. A further complication is that the dating for any of these cultural periods is much argued and disputed, as is even their order and the extent to which any of them may have over-

lapped with others. Every source I have consulted contradicts every other source, and as a result dates given here may well contradict whatever date is given in a previous or succeeding paragraph – as a non-expert in the MesoAmerican cultures, I can only quote what I find. For the final pre-contact culture, that of the Aztecs, it is easy because they were the dominant culture when the Spanish arrived, and we have much pictorial evidence of conchs from the codices that were brought back to Europe by the early invaders from 1500 onwards, as well as in the written Spanish reports of what they saw and heard there. From the earlier peoples in those areas, we are restricted to archaeology and to a limited amount of iconography.

According to Arnd Andje Both, shell trumpets in this area, such as *Turbinella angulata* (Lightfoot), date back as far as the latter part of the Early Preclassical period (according to Both dating to 2000–1200 BCE, but note that other sources give 1250–800 BCE for the Tlatilco), in burials at Tlatilco, a post-Olmec culture in the Valley of México.⁴

The Olmecs are said to have been the earliest known major culture, establishing themselves in the southern part of the Gulf of México round the Bay of Campeche, where they flourished from around 1400 to 400 BCE. Although their culture died out,

⁴Arnd Adje Both, ‘Shell Trumpets in Mesoamerica: Musicarchaeological Evidence and Living Tradition’, in E. Hickmann and R. Eichmann, eds.: *Studien zur Musikarchäologie* IV, 2004, 261–277.

many of its features seem to have continued among the later MesoAmerican civilizations, but blowing conch trumpets does not seem to have been a part of their practices, or at least we have no evidence for it. The Olmecs of eastern México, and the Tlatilcans of the central Valley whose art and other features resemble that of the Olmecs, are said to have been succeeded by the Teotihuacán, who, like the Tlatilcans, flourished in the Valley of México from about 150 BCE. We get positive evidence of shell trumpets from Teotihuacán, with shells such as *Pleuroploca princeps* (Sowerby) (aka *Triplofusus princeps* (Sowerby)).

One of these, now in the Museo Nacional de Antropología, México City, is covered with an incised stucco layer with a polychrome painting of a headdress.

Teotihuacán seems to have been basically a single city, about 30 miles north of modern México City, but it controlled a fairly large region of México until around 600 CE. Conch trumpets appear frequently in their art and Samuel Martí illustrates a *Lobatus gigas* shell from around 500 at Teotihuacán.⁵ Other conchs have also been found, dating from 350 and 500, all from burial sites. Only one pottery skeuomorph has so far been found at Teotihuacán, from 400–450 and that was also in a burial.

What is particularly interesting is that what appear to have been ceramic mouthpieces have been found that had been fixed

⁵Samuel Martí, *Alt-amerika*, Musikgeschichte in Bildern II:1 (Leipzig: DVfM, 1970), 43–5.

to the shell with wax. This use is confirmed by the number of reliefs and other art that show very clearly conchs with an added mouthpiece, looking a little like a cotton-reel on the end of the conch. These may have been either ceramic or, Both suggests, a stone ear-spool, a carved waisted tube of stone that was inserted into a slit in the lobe of the ear. Both's figures 4 to 8 show very clear examples of these mouthpieces, both on a real shell and in wall carvings. Teotihuacán iconography also shows that conchs there were decorated with elaborate plumes of feathers, with one temple being decorated with stone reliefs of conch trumpets showing both plumes and mouthpieces. This suggests a link to, perhaps the beginnings of, the worship of the god Quetzalcoatl, who as the Plumed Serpent was much associated with the conch among the Aztecs, who became the dominant power from the early fifteenth century, though they had immigrated into México from around the seventh century onwards. As we have already seen, this association between conchs and the Plumed Serpent was one that also spread among the Hohokam and the Zuñi in the north. Thus, although the archaeologists and historians assign different names to each culture, it is clear that even after conquests or other changes, each succeeding culture adopts some concepts from that which they have over-run.

Other Teotihuacán illustrations show water flowing from conchs, indicating that conchs in that culture were a very important part of religious life, especially connected with fertility and renewal; they also appear in scenes of human sacrifice.

In the Mayan period that both overlapped and followed the Teotihuacán, we have evidence, particularly of the *Lobatus costatus* (Gmelin) shells (aka *Strombus costatus*) or milk conch, though Both says that the *Pleuroploca gigantea* (Kiener) (aka *Triplofusus gigantea* (Kiener)), known as the Florida Horse conch and the largest conch found in American waters, was the predominant species that was used.

The Mayan cities arose around 750 BCE, though their Classic period is dated by Both to CE 150–900. By 250 CE they ruled over the areas that are now southern México, Guatemala, Belize, and parts of Honduras and El Salvador. Culturally the Maya were the most important of all the MesoAmerican cultures, with writing, art, the adoption and perfection of the Long Calendar (though it has been suggested that this was initiated by the Olmecs), and astronomy. Their central area collapsed around 900, but their culture continued and much was later absorbed by the Toltecs.

There are various examples of Mayan conchs in collections, and one, dated to 250–400 CE, that is now in the Kimbell Art Museum, at Forth Worth in Texas, came from Guatemala. It has what appears to be a drilled fingerhole on the opposite side of the bell from the Fijian, on the main curve of the skirt, but of approximately the same diameter as far as can be judged from their photograph. Another Mayan conch now in the National Archaeological Museum of Guatemala and illustrated by Martí

has four fingerholes, and a second has six,⁶ and a further figure on his p.75 shows the tube of a conch drawn out as a straight tube with the diameters of four fingerholes given, ranging from 1.3 to 5 mm, along with the distances between them. However, he gives no details of the pitches, nor of the melodic intervals that they would have produced, though it might be possible to make an estimate by calculating all the measurements into approximate pitches. He may not have been allowed to blow the shell, because some museums have always been reluctant to allow their instruments to be blown, just as almost all are nowadays. I was very lucky back in the early 1960s to be allowed to blow Fijian shells and Pre-Columbian American pottery ones, as well as many other instruments such as Tibetan human bone trumpets.

We have no evidence of how or why these fingerhole shells were used and what they played, even though the Mayan was a literate culture, for nothing relevant seems to have been discovered, or at least has not been published as yet, but there is much speculation over their possible melodic purposes. Certainly it is difficult to think of any reason for drilling such fingerholes other than to play tunes of some sort. Four to six fingerholes seems far too many just for a signal code. One shell that Both cites and illustrates (his figure 10) is dated to 300–500, and is carved

⁶Samuel Martí, *Instrumentos Musicales Precortesianos* (México: INAH, 1968), figs. p.71.

to show the incised figure of the god Uc-Zip, with the body of the shell forming his face and one fingerhole his eye, with an enthroned figure holding a second fingerhole, but we have no evidence to suggest that such fingerholes, and their melodic or other results, may have been relevant to his worship.

Most Mayan conchs seem to have been found in tombs, as with the Teotihuacáns, and thus it seems clear that, like so many others, they were ritually important instruments, an association that is emphasised by the iconography. However, since at least one that Both mentions has on it the glyphs that represent the name of the man with whom it was buried, it always remains possible that some were simply treasured personal possessions — he may perhaps have been a professional conch-blower in some ritual or other capacity, like a state trumpeter in Europe. Both cites also the use of conchs both for the hunt and for war.

The Toltecs arose in central México from around 700, just when the Mayan empire was beginning to collapse — the reasons for the successive collapses of these cultures are complex, and are beyond the scope of this book, as are the traces of their survival among the indigenous peoples, though it should be noted that among the other features of each culture that survived, conch-blowing seems to have been endemic. Whether the Toltec culture ever existed or whether it was invented as a mythical history by the Aztecs, seems to be debated, like so much else in this geographical area. Certainly there was a major city in central México called Tula, dating from around 900 to 1170, which

has been thought to have been the Toltec centre, and there are conchs and images of conchs that claim to be Toltec. Since the Teotihuacán culture ended around 600 and the Mayan civilization in the south collapsed around 900, there does seem to be scope for some dominant power in the area between those dates and the arrival of the Aztecs.

The Aztecs were a Nahua people, who arose to power in the mid-thirteenth century from somewhere in the north, perhaps even beyond what is now the northern border of modern México, though as suggested above they may have been drifting into the area since the seventh century. They established their centre at Tenochtitlan, an island in a marshy area, that is now Mexico City.

Among the Aztecs the conch was associated with the creation myth. Humanity was created when Quetzalcoatl blew the conch that had belonged to the Lord of the Underworld to the four cardinal points and to the centre of the world.⁷ At one temple, a shrine to the Lord of Creation, the conch was blown, along with other instruments, four times a day to call the king to prayer.⁸ There was also one less common, non-blowing, use, that of the conch as a resonator at funerals. Apparently the main Aztec funereal instrument was a notched bone scraped with a

⁷Both, *op. cit.*, 264.

⁸Robert Stevenson, *Music in Aztec and Inca Territory* (Berkeley: University of California Press, 1968), 39.

piece of shell or bone; while this normally rested on a skull as a resonator in the illustrations in the codices, at least one shows the bone resting on a conch.⁹ Conchs were blown in many other rituals also, such as at a self-bleeding ceremony to feed the gods.¹⁰

Two *Lobatus gigas* shells were deposited in offerings at the Great Temple of Tenochtitlan, one dated to 1469–81 and the other to 1481–1502. Stressing their importance, there is a huge stone carving of a *Lobatus* with a pierced apex that was on an altar excavated 50 metres east of the Great Temple.¹¹ Also miniature shell trumpets have been found in tombs which, perhaps, were intended for the dead to use in the after-life. The link with fertility is shown by a pottery shell containing a cradle.¹² This link with human fertility is emphasised by the fact that several sanctuaries were dedicated to the conch and where the priests would teach novices how to blow them, in the temple of the goddess of conception and birth.

We have many depictions of the conch being blown in the few codices that survived the frenzied campaign of the clergy to destroy all such pagan things, and that were brought back by the Spaniards and preserved in many libraries in México, North America, and Europe. They show conchs blown in battle and

⁹Stevenson, 58–9.

¹⁰Ibid., 34 and 39.

¹¹Both, fig. 16.

¹²Ibid., fig. 17.

in many rituals, and in one codex the player can be seen with a hand in the bell, possibly indicating pitch modification in the same way that we saw in Oceania. There is, however, no sign of any modification of the shell itself among the Aztecs, with no indication of mouthpieces or fingerholes. And it is also clear that it was the *Lobatus gigas* that was the most important species among that people, though there is some evidence for the use of the *Fasciolaria tulipa* L.

As well as these codices we also have many contemporary accounts of what the Spaniards heard and saw in their newly-conquered territories. Juan de Torquemada listed the instruments that the Aztec Emperor Toctezuma liked to hear at meal-times, ‘clay flutes, reed flutes, conch shells, bones, and huehuetl [drums]’, Torquemada adding that none of Cortés’s men much cared for that music.¹³

Conchs have been found also in other parts of México. For example, a pottery copy of a *Lobatus gigas* shell, dated to 300–900 was found at Colima on the west side of México. *L. gigas* is a Caribbean species and the model for the copy must have been traded across the country, nearly to the Pacific coastline.¹⁴ Furst cites another discovery in western México, in a tomb at Etzatlán, with an *L. gigas* conch trumpet, which was carbon dated to c.266 BCE whereas other things in that same tomb were dated

¹³Stevenson, op. cit., 119.

¹⁴Martí, *Alt-Amerika*, 70–71.



Figure 6-2: Pottery skeuomorph of a *Lobatus gigas* conch, México, modern, with incised and coloured decoration. Montagu Collection, X 272.

to 254 CE, with the interesting conclusion that the shell must have been 500 years old when it was buried.¹⁵ It is intriguing to wonder where it had been, travelling from the east coast to the west, during that time, and at what stage in its journey had the apex been removed to convert it into a trumpet. Also, why had it been so valued an antique that it was buried in that tomb?

¹⁵Furst, op. cit., 3–4.

The conch is still used in México. Both cites examples among the Huichol and Lacandon, peoples widely separated from each other, but both using it in still-surviving rituals. The fact that pottery examples are still made, though perhaps mainly for tourists, is shown by my own example (fig. 6-2), a modern pottery shell rather approximately, and somewhat clumsily, based on an *L. gigas* conch.¹⁶ It is brown in colour, decorated with green patterns, and quite rough inside, with a long curved tail. The sound is not well defined, probably due to the rough inner surface. It has not been X-rayed, unlike two others of mine, but it appears to have the full natural interior shaping.

Ecuador

I have only a little evidence from that area, and that I owe to my grandson, Aviad, who was travelling all round central and southern South America on the traditional Israeli post-army holiday tour. He was in Guayaquil where they have an anthropology museum with an exhibition of 10,000 years of Ecuadorian archeology. There he saw five or six conchs on display, of different sizes and species, that came from the Valdivian culture, named for that nearby city, a culture that existed as far back as 3500 BCE and lasted until around 1800, and from the Chorrera

¹⁶Catalogue X 272. It was bought in Oxford from Tumi, a shop dealing in Middle and South American material. Dimensions OL 365; OW c. 180; OH 153; emb \varnothing 11.9 \times 7.8; pitch d' -20 cents.

culture which flourished between 1300 and 300 BCE. He sent me a link to one page in their catalogue which shows a *Lobatus*, but there is no information there other than a catalogue number of RA. 23–05 and the statement that it came from Valdivia. Photography in that museum was prohibited and therefore I have no further information of species, nor of any individual dates or find circumstances.

South America

Peru

We have evidence for conch trumpets at earlier dates in Peru than in México, though it should be said that dating artefacts and even the different cultures of South America is both difficult and hotly disputed, perhaps even more so than in México. Furst, for example, has suggested that the Cupisnique, Chavín, and Mochica cultures may have been coeval, or at least overlapped, with each other, whereas others state that each succeeded the other in that order.¹⁷ A *Lobatus galeatus* (Swainson) (the Pacific species of *Lobatus* that we met above), dated to between 2500 and 1700 BCE, was found at Chiclayo on the northern coast of Peru, incised with a portrayal of a Chavín-style deity blowing a conch, among a considerable number of others

¹⁷Furst, 11.

that were even older and that came from the pre-Chavín culture. Other examples with incised decoration and well-worn embouchures have been found from Chavín times. Examples of *Malea ringens* (Swainson), an Ecuadorian species of shell also known as the grinning tun, of similarly early date, were found on the eastern side of the Andes in the northern Peruvian highlands.¹⁸ Carrying such objects across those mountains yet again stresses the importance of conchs in some cultures.

The Moche culture seems certainly to have continued later than the other Peruvian cultures noted above, with its highest artistic skills in ceramic art dating from around 200 BCE to 600 or so CE. Throughout its period, conch trumpets were widely used, for many have been found and many are also portrayed on anthropomorphic ceramic pots. Indeed, there are so many that have been found in archaeological contexts that there is little point in trying to list them. Also, many of their pottery conch skeuomorphs are known in museums around the world. These represent a variety of species, not only the *L. galeatus* and *M. ringens* mentioned above but also the *Conus fergusonii* Sowerby, whose habitat stretches from the Gulf of California down to Peru; all three of these species were also used as trumpets in their natural forms.

¹⁸Manuel Gorriti Manchego and Victor Falcon Huayta, *Spondylus, Strombus, and Conus: Offerings to the Gods* (Lima: National Museum of Archaeology, Anthropology and History, 2002), 10–11.

The first of these pottery skeuomorphs that I encountered was the one in the British Museum, whose X-ray showed that it followed exactly the internal form of the natural shell. A number of other museums kindly made X-rays for me, and some of these I published in *World Archaeology* back in 1981.¹⁹ Of all those that I have been able to examine, only one in the Ethnographic Museum in Göteborg in Sweden (no. 57.14.3) failed to copy the natural internal shape. That specimen had, below an embouchure 18.5 mm in diameter, a cone-shaped upper section rather like an inverted egg-cup 45 mm deep, that led to an empty body, via a small hole about 4 mm in diameter, leading from the upper section to the body.

This difference, from all the other pottery ones that I have been able to blow, leads to a wide speculation, for the sound that it produced, when I blew it in the museum (this was long enough ago that such things were allowed to serious researchers), was much the same pitch as that of both natural and pottery shells of around the same size, which was 20 cm long overall. Instead of an expanding tube about 2 foot 3 inches long (around 70 cm), as described in the Introduction, we have here a series of three steps, the embouchure area of around 20 mm, the upper section of 45 mm, plus the body of perhaps another 50 mm, a total of 115 mm or around 5 inches between the top of the embouchure

¹⁹Jeremy Montagu, 'Conch in prehistory', *World Archaeology* 12:3, (1981): 273–9 and pl. 13–16.

and the opening of the bell. Could it be that the air in a shell vibrates as a whole, as an air body rather than as an expanding tubular air column? Is it possible that the very thin walls of each whorl of the natural shell vibrate with the sound to such an extent that the air vibrates within them as a single unit? If so, this raises the very intriguing question of whether there is such a thing as a vessel trumpet? This is not a concept that to my knowledge has ever been discussed before, but it is the only explanation that I have been able to form for the pitch of that pottery shell in Gothenburg (the more-commonly used non-Swedish spelling for that city), unless, just maybe, might this be a stepped cone with inordinately wide steps?

This, if it were a vessel trumpet, would equate it with an ocarina (which is a vessel flute), or better a Helmholtz resonator, like a number of other types of instruments such as slit drums, whose pitch depends upon their volume and the area of their aperture: the slit for slit drums, the fingerholes for ocarinas, and, for the resonance pitch of the body, the f-holes for violins, the holes in the rose for lutes and guitars, and so on, and the open bell of the conch. Thus when hand-stopping a conch one is reducing the open area of the bell and so lowering the pitch, and when opening a fingerhole on a Fijian or a Mayan conch one is increasing the area of open hole and raising the pitch.

I do not have the physics, nor any of the equipment that may be necessary, to find the answer to this question, to determine whether a conch is an expanding-bore tube or a vessel. One ar-

gument against this possibility is that many conchs overblow to the octave or fifth, whereas vessel flutes appear not to overblow at all – but might they also do so if the sum of the area of their open holes was as great as that of the bell of this conch? I regret now that I made no note of whether that shell did overblow! I would be very interested to hear from anyone who might be willing to experiment on these lines. I do have colleagues who have, on my and their behalf, experimented on violins and lutes and who have shown that their bodies are a form of Helmholtz resonator in that the resonance pitch of their bodies is affected by their volume plus the area of open hole. The similar effect on a slit drum is easily demonstrated by putting a hand over more or less of the slit while striking it with a beater in the other hand, so changing the area of the slit, and altering the pitch.

We do also have potential overlap here with some cylindrical trumpets, such as the Asmat bamboo trumpet illustrated in the previous chapter. This, though only 400 mm long and with an internal diameter of around 60 mm, produces the pitch of ab' , almost the same as one of my larger tritons. Is this trumpet producing so low a pitch for its length because it is a cylindrical tube, and thus sounding around an octave lower than an expanding tube of the same length, or because being so wide for its length it is functioning as a vessel?



Figure 6-3: Pottery skeuomorph of a *Malea ringens* conch, Mochica people, Peru, c. 6th century AD. Montagu Collection, XI 122.

More recently I have acquired a Moche example of my own (fig. 6-3).²⁰ It is of red and gray pottery, not as well made as the British Museum example, but clearly an approximation to an *M. ringens* shell. The mouthpiece has a round hole near the bottom of the cup to one side, leading to the first whorl of the shell.

²⁰It was bought at the Phillips, Ethnography sale of 8 December 1992, in London, lot 171 that included also a small single-coil pottery trumpet from the same area, as well as some Moche pots. Its number is XI 122 and its dimensions are OL 140; OW c. 134; OH 104; emb \varnothing 16.5; pitch $e\flat'$ -10 cents.



Figure 6-4: MRI scan of the interior of the same shell.

Because it was bought at auction it has no known provenance save that it had been part of a collection of other pottery objects from the same area, and which came in the same lot. Both it, and the small coiled pottery trumpet that also came with it, blow well.

The Ashmolean Museum in Oxford kindly made X-rays for me, one from the side and the other from the end, and since then, like the Khmer shell above, it has been through a hospital

scanner (fig. 6-4) with even clearer results. Not only can one see the whole interior shape, as shown here, but the technician, Steven Turnbull, produced a brilliant short film during which one flies through the interior from one end to the other. He did this, he said, as an experiment to see whether one might also be able to fly through tubular parts of the human anatomy.

Before I had acquired that genuine pottery shell, John Taylor, the London potter who first devised those small pottery ocarinas with four fingerholes and two thumbholes that are now sold everywhere, often to be worn as a pendant on a thong round the neck, made me two very approximate copies of a Moche conch (fig. 6-5). They were approximate because he had never seen an original and also because he only got round to making them in 1991, twenty years after I had shown him a photograph of the British Museum pottery shell and asked him to do so.²¹ They are fired jet black and they are very noticeably lighter in weight than the Moche conch. He assures me that they do have the full shaping of a natural shell inside, but he would not reveal how he had made them.

This is something that I have wondered about: how does one shape each whorl above the other and attach it without crushing the one below? Even at the leather stage of drying, clay can

²¹Their dimensions are: XI 18a: OL 198; OW c. 106; OH c. 8 4; emb \emptyset c. 15; pitch $f\sharp'$ and XI 18b: OL 173; OW c. 103; OH 76; emb \emptyset c. 16; pitch a' -10 cents.



Figure 6-5: Two modern pottery conchs by John Taylor, London, 1991. Montagu Collection, XI 18a and b.

easily be pushed out of shape or cracked. I wondered whether there was, perhaps, a wax core made as the helix progressed in the potter's hands so that this supported each layer as the one was formed above the other? The wax would then melt out as the conch was fired in the kiln. I had thought that if one were able to obtain some fragments of broken original examples, it might be possible to determine this by chemical analysis even after all these centuries, just as archaeologists today commonly analyse the traces of food in archaeological finds of bowls and pots to determine what the ancient people ate from them.

However it is clear now from the information sent to me by Lars-Christian Koch about the Indian manufacture of pottery

shells, described above in Chapter 3, that the process is much simpler than I had thought.

As with all archaeological finds in pre-literary cultures, we can only guess why the Moche needed pottery copies of shells and what they were used for. Find sites can tell us that they were probably used for ritual purposes, for most came from tombs. Certainly, as with the many other examples above, they were of cultic importance. Robert Stevenson says that ‘Powerful and sinister demons capable of wreaking havoc on one’s enemies took up their abode inside conch trumpets.’²² He cites some ceramic examples in the Museo Nacional in Lima that actually have such demons, modelled in the pottery, inside the bell of these conchs. One of these, in the Moche Archive in UCLA, is illustrated by Dale Olsen.²³ But there is nothing that can tell us why coastal and near-coastal cultures went to the trouble of making skeuomorphs of pottery when natural shells could be picked up on the beach. Possibly in some cases there was antagonism and/or lack of trade between lowland and highland peoples, or, as suggested above with the Khmer conch, that something humanly, and perhaps ritually made, has a spiritual value that is greater than the external skeleton of a dead marine animal, but the question remains a tantalizing one. Stevenson suggests that

²²Stevenson, op. cit., 257.

²³Dale Olsen, *Music of El Dorado* (Gainesville: University Press of Florida, 2001), fig. 8.19.

it was because *L. galeatus* 'does not flourish in Peruvian coastal waters and has to be imported from so great a distance as the Isthmus of Panama, that the Mochica instrument makers fell back on clay imitations of the large conch.'²⁴ However this theory could be discounted because a) the distribution of *L. galeatus* does extend to Peru, and b) there are clay copies of many other smaller species of conch that are also common in those waters. It is also always possible that their potters just wanted to show that they were so skilled that they *could* make them.

The final culture in Peru before the arrival of the Spaniards was that of the Inca. Theirs was an imperial power, but it lasted for barely a century before they were overwhelmed by the Conquistadors. Some authorities say that they were an immigrant people, conquering the Killke people in an area around Cusco in the Andes in south-eastern Peru in the thirteenth century; others suggest that the Inca had actually originated in that area. As so often in early South American history, much seems to be controversial. They expanded rapidly from Cusco in the 1430s to conquer a large strip of the western bulge of South America from Ecuador down through Peru into what is now Chile, and including parts, at least, of Bolivia and Argentina. This was made possible by a conscript army drawn from each people that they conquered, and among the army there were always conch blowers and other trumpeters who were, especially the conch blowers, of

²⁴Stevenson, 256.

high status.²⁵ They built roads both to enhance communication from one area to the next and also to aid the movements of the army from one conquest to the next, unifying their empire also by insisting on the adoption of their own language, Quechua. It is impossible to avoid mentally comparing them with the Romans, for so much of their methods, and of their organisation, are so similar.

As with all the preceding cultures in that part of the world, conchs remained a feature of their communities. One of these was a communication system, similar to that of the Babylonian Empire at its height, but instead of the Babylonian messengers on horseback (animals that were only introduced to the Americas by the Spaniards), galloping along a relay system of staging posts, those of the Inca were runners, who ran from one staging post to another. As well as their messages they carried a conch (*pututu* in the Quechua language) which they would sound as they approached a staging post to warn the next messenger to be ready to run, just as in the British days of mail and stage coaches, a post horn was blown to have the next team of horses ready.

Aurelia Hartenberger has sent me photos of two Inca shells in her collection that were collected in Peru in the second half of the twentieth century by Dr Lewis Hilton, an archaeologist at Washington University in St Louis (fig. 6-6). They are dated

²⁵Stevenson, 273.



Figure 6-6: Two conchs, *Malea Ringens* (left) and *Lobatus galeatus* (right), Inca people, Peru, c. 1500 AD. Aurelia Hartenberger Collection, used by her kind permission.

to 1300–1500. That on the left is a *Malea Ringens* (Swainson), still with traces of its original wax round the embouchure area, although the embouchure itself has broken away, and that on the right is a *Lobatus galeatus*, with a well-worn embouchure. Each has a hole in the bell rim for a suspension cord.²⁶ The remains of the wax coating round the embouchure area of the *M. Ringens*, is

²⁶ *L. galeatus* OL 229.3, OW 181.35, OH 114.00, emb \varnothing int 16.12, emb \varnothing ext 27.93, pitch d'' -20 cents; *M. Ringens* OL 190.85, OW 147.85, OH 96.5, emb \varnothing N/A (embouchure broken away). I am very grateful to her for taking the trouble to measure these and others of her conchs, so that they can be compared with mine.

thought to have been to protect the lips while blowing; certainly a number of excavated shells do have this coating, often in a much more complete form than with this example, surrounding the whole embouchure area.

Karl Gustav Izikowitz cites many other instances of conchs still in use almost throughout the northern parts of South America.²⁷ He gives the main use as for signalling in war, but says that conchs were used also for general purposes, including by travellers to show their peaceful intent and their destination when passing strange villages. This last is a common use for instruments in many parts of the world; silent travellers may be suspected as being thieves or enemy spies, and therefore innocent ones often sound trumpets, beat small slit drums, and make other noises, just to show that they have no nefarious intent.

One particularly interesting example cited by Izikowitz is the use of Pacific shells among tribes such as the Jívaro and Mayoruna to the east of the Andes in the twentieth century, just as they had been in antiquity.²⁸ This, yet again, stresses the importance of shell trumpets among so many peoples, that they should have been carried right across these mountains to the far side of the Andes. Dale Olsen gives us one reason, for he stresses the use by shamans, or *curanderos* as they are called in

²⁷Karl Gustav Izikowitz, *Musical and other Sound Instruments of the South American Indians* (Göteborg: Elanders, 1935), 227–30 and table 248–9.

²⁸Izikowitz, 228.

northern coastal Peru.²⁹ So maybe their presence in these areas is simply due to the widespread continuity of various forms of cultic uses.

Certainly conchs are still widely used in Peru and in many other parts of South America.³⁰ The Quechua in Peru use them in church services, blowing them in ensembles in parts of the Mass, and also to call people together for assemblies and for communal activities.³¹

Before we leave the subject of conch trumpets and Peru, we should note one example of a natural shell reportedly excavated at Cañete in the southern part of Peru, that could date to 900–1200 CE, a *C. tritonis* that is side-blown.³² This, both in pattern and in its decoration of bands of woven cloth, tassels of human hair, and carved cylindrical toggles, resembles very closely a shell from the Marquesas Islands in the Oldman Collection at the Brooklyn Museum of Art in New York. This is probable evidence for some form of contact from west to east, the opposite direction to that of Thor Heyerdahl and other raft voyagers, between the west coast of the Americas and the islands of Oceania, for the habitat for this species does not appear to extend as far as the American coast. Ferndon, whose book on the Marque-

²⁹Olsen, *op. cit.*, 143ff

³⁰Malena Kuss, ed. *Music in Latin America and the Caribbaean; an Encyclopedic History* (Austin: University of Texas, 2004).

³¹Kuss, 306.

³²Furst, *op. cit.*, 30–32.

sas Islands was cited in the last chapter, mentions much other evidence for such contact, particularly in connection with agricultural plants for food supply. He points out that while the prevailing winds blow from America to the Islands, the El Niño current goes the opposite way, allowing islanders to be swept, probably initially inadvertently, towards Peru, with the winds making the return journey possible, and thus opening a trade route.

While we are on the subject of *C. tritonis*, perhaps I should add that there are several more shells of that species in my collection, but since all of them were converted from bought shells to blowing ones by me, initially to illustrate lectures and later to complete the chromatic scale that I needed for the film *Alien*, mentioned in a previous chapter, there is little point in describing or illustrating them.

The East Coast of South America and the Islands

Looking now at the other side of the continent, to the east coast and the Caribbean and West Indies, we come to an area where *Lobatus gigas* (L), the queen conch, and *Cassis tuberosa* (Linnaeus), the helmet shell, are the main shells.

There is evidence for their use in Costa Rica and Panama, where the Cuna (also spelled Kuna, and nowadays Guna) people use the conch to signal when returning home or when a hunter

has been separated from others in the woods.³³ The *Guaymí* people of western Panama blow conchs when they pass near anyone living on their route to inform them of their destination, and the Paez people of Colombia have a sea-shell dance to the sound of two conchs, one higher in pitch than the other, blowing them alternately for whole nights.³⁴

The Warao of Venezuela, on the Caribbean coast use the *L. gigas* for fishing signals, to signal deaths and for festivals,³⁵ and Izikowitz cites uses in what were the Guianas, the countries immediately to the south-east of Venezuela, near the Orinoco delta, which are now part of Venezuela for what was Spanish Guiana, Brazil for what was Portuguese Guiana, an overseas department of France for what was French Guyane, Suriname for what was Dutch Guiana, and an independent nation, Guyana, for what was British Guiana. These are all somewhat confused and several are claimed, and counter-claimed, by other larger neighbouring countries. The conch is also used as far south as Maranhão in north-eastern Brazil where it was used by the Tupinambá people.³⁶ Izikowitz says, though, that there is no evidence at all for any use of the conch further south than the north of Brazil, anywhere in all the rest of that continent. Even in Amazonia,

³³Izikowitz, op. cit., 229.

³⁴Ibid.

³⁵Kuss, 306.

³⁶Izikowitz, 228.

where wooden and other forms of trumpet are common, there is no trace of the use of conch trumpets.

There are also some brief references to possible archaeological findings of shells in some of the islands. Kuss mentions Cuba and Curaçao from pre-Hispanic times,³⁷ and Izikowitz mentions St Thomas, one of the Virgin Islands, where it may have been used by the Tainos, the aboriginal people of that area, for an *L. gigas* was found there in a stratum of the pre-Hispanic era.

Today, there is much contemporary use on many islands of both the Caribbean and the West Indies. These two terms are sometimes regarded as synonyms, but are also sometimes differentiated, mainly for historical reasons because Columbus thought that he was in the Indies and once it was realised that he was wrong, West Indies was used to distinguish the Caribbean islands from the East Indies. There are four larger islands, Cuba, Haiti and the Dominican Republic who share the second largest island, Jamaica, and Puerto Rico (the Greater Antilles), and a host of smaller ones (the Lesser Antilles), with the Bahamas to the north and Bermuda by itself even further north. Many are now independent states, but some are still parts of colonial powers, such as the U.S. Virgin Islands.

Conchs are used fairly universally throughout the islands as fishermen's horns and as general signal horns on land, including

³⁷Kuss, vol. 2, 132 and 432.

by farmers, as well as for festivals and carnivals. A particular feature of this general area is that the contents of the shells are well-known to be eaten. The conch is thus a favourite item of the local diet, something that nobody seems to mention for the mainland of South and Central America. It would seem surprising if the inhabitants of the shells were not eaten in those areas also, for unless all the blowing shells were fossils, empty shells washed up on the beach, it would seem odd, unless there were some form of cultic taboo, for people to ignore free food. Never having tried this sort of food myself, I do not know whether some species taste better than others, but even poor-tasting free food is free food in areas where there is endemic poverty. Anyway, it is certain that at least for these chains of islands, conchs are eaten, recipes for their preparation seem to abound on the Web, varying from island to island in their styles and methods of preparation, and it has even been suggested that so important are they in the local diet that the shells in tourist and other such shops, as well as the blown shells, are simply the waste products of the local kitchens.

I have three examples of the *Cassia tuberosa* (L), the helmet shell. The one that is illustrated here (fig. 6-7) came from Barbados, where it was said to have been a fisherman's horn.³⁸ It is the typical conch of those islands.

³⁸It was brought back thence by my mother in the early 1950s. It is no. I 18a in my collection and its details are: OL 205; OW 175; OH 131; emb \varnothing 23.2×22.8; pitch e_b' +30 cents. I bought the other two (I 18b and



Figure 6-7: A *Cassis tuberosa* conch, a fisherman's horn from Barbados. Montagu Collection, I 18a.

Finally we should return to cultic use in modern-day northern America. Shells are now widely used (there is much evidence on the Web) for various esoteric cults, mostly those of individuals with what appears to be the motive of self-promotion, sometimes as aids to meditation and other cultic purposes. The shell is easily blown; it can easily be associated with all sorts

III 66b) in London and converted them into blowing conchs. Their details are: I 18b: OL 221; OW 179; OH 144; emb \varnothing 28.9 \times 25; pitch c', and III 66b: OL 168; OW 150; OH 121; emb \varnothing 21.1 \times 17.2; pitch f' -30.

of mystic connotations; it is a natural object, with none of the stigma of our industrial world, so that it can exemplify all forms of 'back to nature'.

It also has a place in experimental musics and in advanced forms of jazz, just as has now the didjeridu, as an exotic presence in such musics. Like any other instrument, it can be blown with the unconventional techniques that are applied also to our orchestral instruments, in such contexts, to produce multiphonics and other effects. It can be amplified and fed through fuzz-boxes and other electronic devices. While this, and the modern cultic uses immediately above, constitute an important contemporary usage of the conch, it is beyond the main thrust of this book and, I have to admit, beyond my own knowledge and, I should further admit, beyond my personal interest. So anything further in this area I propose leaving to other authors.

Coda

Even though we have circumnavigated the world, from Europe eastwards round the globe to the Caribbean, the last lands before returning to the shores of Europe, this can only have been an incomplete survey. There are inevitable gaps (are conchs used in the Azores, for instance?), some because I have not succeeded in finding necessary references, both geographical and for usages, and some because there are no such references available. We have also noted what do seem to be cultural gaps in their use, particularly along the southern littoral of the Mediterranean and those northern parts of West Africa that are well within the conch habitat zone. But we have seen the widespread use of the shell as a trumpet from high antiquity to the present day. This is a use in its traditional life that is dying out in many parts of the world, partly because of cultural changes to local lives, and partly due to the availability of modern electronic devices to supersede some of the traditional uses such as signalling, and also because several species of conch, among them *Charonia tritonis*, the archetypical conch, are now protected species. *C. tritonis* is protected because it is one of the few predators of the starfish that are rapidly eating away so many coral reefs in the Pacific, and the natural appetite of this conch seems to be the only way that has been discovered so far to control the spread of the starfish and thus to protect the reefs. This means that that and other species will survive under the seas, but that fewer conchs

will be available to blow in the future, so that those of us lucky enough to have them should treasure them. Local peoples are unlikely ever to have heard of CITES, the laws that control protected species, but there will be fewer for collectors and fewer for those of us who just like to blow a conch for our own and others' amusement.

Bibliography

Abbreviations:

CNRS: Centre National de Recherche Scientifique

CUP: Cambridge University Press

DVfM: Deutscher Verlag für Musik

GSSJ: *Galpin Society Journal*

OUP: Oxford University Press

UP following a place name: University Press

Allen, Jim de Vere, Part of the Introduction in Gerhard Kubik, ed. *Ostafrika* (Musikgeschichte in Bildern I/10) (Leipzig: DVfM, 1982).

Ammann, Raymond, *Danses et Musiques Kanak, Une présentation des danses et des musiques mélanésiennes de Nouvelle-Calédonie, dans les cérémonies et dans la vie quotidienne, du XVIIIe siècle à nos jours*. (Nouméa: A.D.C.K., 1997).

Anoyanakis, Fivos, *Greek Popular Musical Instruments* (Athens: National Bank of Greece, 1979).

Bachmann-Geiser, Brigitte, *Die Volksmusikinstrumente der Schweiz* (Handbuch der europäischen Volksmusikinstrumente I:4), Leipzig: DVfM, 1981).

Bailey, C. R. Kim, 'Traditional Ponapeian Music: Classification and Description', MA thesis, University of Hawai'i at Manoa (1978).

Baines, Anthony, *Brass Instruments, their History and Development* (London: Faber, 1976)

Bayer, Batya, 'The Conch Horn of Hazor', *Tatzlil* 3 (1963).

Beaver, W. N., 'A Further Note on the use of the Wooden Trumpet in Papua,' *Man* (1916), 23ff.

Bellia, Angela, 'Oggetti sonori e strumenti musicali in Sicilia dal Neolitico al Bronzo Antico e dall'Età del Ferro all'Età Arcaica, Classica ed Ellenistica', in *Strumenti musicali in Sicilia*, ed. Giovanni Paolo Di Stefano, Selima Giorgia Giuliano, Sandra Proto (Palermo: Regione Siciliana, 2013).

Bennett, C.-M., and P. Bienkowski, *Excavations at Tawilan in Southern Jordan*; British Academy Monographs in Archaeology 8 (Oxford: OUP, 1995).

Berlioz, Hector, *Traité d'Instrumentation et d'Orchestration* (Paris: Henri Lemoine, Nouvelle Édition, 1855; repr. Farnborough: Gregg Press, 1970).

Best, Elsdon, *Games and Pastimes of the Maori* (Wellington: Dominion Museum, 1925).

Boekelman, Henry J., 'Shell Trumpets from Arizona', *American Antiquity* 2:1 (1936), 27-31.

Bonanzinga, Sergio, 'Oggetti sonori e simulazioni rituali', in *Il potere delle cose. Magia e religione nelle collezioni del Museo Pitirè*, ed. Ignazio E. Buttitta. (Palermo: Eidos, 2006)

Bonanzinga, Sergio, and Marta di Mariano, 'Una pesca mimata per incantare il mare. Il dramma dell'uomo-pesce nella Riviera dei Ciclopi' in *Santi a mare. Ritualità e devozione nelle comunità costiere siciliane*, ed. I. E. Buttitta and M. E. Palmisano. (Palermo: Regione Siciliana, 2009).

Borg-Cardona, Anna, 'The Marine Shell in and around the Maltese Islands', *GSJ* 66 (2013).

—, *Musical Instruments of the Maltese Islands: History, Folkways and Traditions* (Valletta: Fondazzjoni Patrimonju Malti, 2014).

Both, Arnd Adje, 'Shell Trumpets in Mesoamerica: Musicarchaeological Evidence and Living Tradition', in E. Hickmann and R. Eichmann, eds.: *Studien zur Musikarchäologie IV*, 2004.

Braun, Joachim, *Die Musikkultur Altisraels/Palästinas* (Freiburg, Schweiz: Universitäts Verlag, 1999).

Buck, Sir Peter: *see* Hiloa, Te Rangi.

Carrese, Marilena, Emiliano Li Castro, and Maurizio Martinelli eds, *La Musica in Etruria* (Tarquinia: Comune di Tarquinia, 2010).

Chang Sa-hun, *Korean Musical Instruments* (Seoul: National University, 1969 & 1976) in Korean with brief English summary).

Chinnery, E. W. P., 'Further Notes on the Wooden Kipi Trumpet and Conch Shell by the Natives of Papua,' *Man* (1917), 55.

Christian, F. W., *The Caroline Islands: Travel in the Sea of Little Lands* (London: Methuen, 1899).

Collaer, Paul, *Ozeanian*, Musikgeschichte in Bildern I:1 (Leipzig: DVfM, 1965).

Dance, S. Peter, *Shells: an Eyewitness Handbook* (London: Dorling Kindersley, 1992).

Deacon, Arthur Bernard. *Malekula, a vanishing people in the New Hebrides* (London: Routledge, 1934).

Diettrich, Brian, ‘“Keeper of the Drum”: Silent Objects and Musical Pasts of Pohnpei, Micronesia’, *GSJ* 64 (2011), 219-42.

Di Nocera, Gian Maria, and Francesco Marano, ‘Sounds from the Sea: Prehistoric Shell Horns’, ??

Ellis, W., *Three Visits to Madagascar* (London: John Murray, 1858).

Evans, Sir Arthur, *The Palace of Minos*, vols. 1–4 (London: Macmillan, 1921–35).

Ferndon, Edwin N., *Early Observations of Marquesan Culture, 1595-1813* (Tucson: University of Arizona Press, 1993).

Fischer, Hans, *Schallgeräte in Ozeanien: Bau und Spieltechnik – Verbreitung und Funktion* (Strasbourg and Baden-Baden: P. H. Heitz, 1958; transl. Philip W. Holzkecht and ed. Don Niles as *Sound-Producing Instruments in Oceania: Construction and Playing Technique – Distribution and Function* (Boroko: Institute of Papua New Guinea Studies, Revised edition, 1986).

Flintoff, Brian. *Taonga Pūoro: Singing Treasures, The Musical Instruments of the Māori* (Nelson: Craig Potton, 2004).

Fukui, Hajime, 'The Hora (Conch Trumpet) of Japan', *GSJ* 47 (1994), 47-62 – in that Journal his name is given in the English way.

Furst, P. T., 'West Mexico, The Caribbean and Northern South America', *Antropologica* 14 (June 1965).

Galpin, Francis W., *The Music of the Sumerians and their Immediate Successors, the Babylonians and Assyrians* (Cambridge: CUP, 1936; reprint Strasbourg: Heitz, Strasbourg UP, 1955).

Gorriti Manchego, Manuel, and Victor Falcon Huayta, *Spondylus, Strombus, and Conus: Offerings to the Gods* (Lima: National Museum of Archaeology, Anthropology and History, 2002).

Guizzi, Febo, *Gli strumenti della musica popolare in Italia* (Lucca: LIM, 2002).

Gunji, Sumi and Henry Johnson, *A Dictionary of Traditional Japanese Musical Instruments from Prehistory to the Edo Period* (Tokyo: [Eideru Kenkyūjo], 2012).

Gyōja Nichō, (Yoshimo, 1976), 20–21.

Harris, Mary Corbett, 'Memories of Merioneth Farms', *Country Life*, 1960, Nov. 3.

Harrisson, Tom, *Living Among Cannibals* (London: George G. Harrap, 1943).

Hassan, Schéhérazade Qassim, *Les Instruments de Musique en Irak et leur rôle dans la société traditionnelle* (Paris: Mouton, 1980).

Hellfer, Mireille, *Mchod-rol; Les instruments de la musique tibétaine* (Paris: CNRS, 1994).

Hilola, Te Rangi [aka Sir Peter H. Buck], *Ethnology of Mangareva* (Honolulu: Bernice P. Bishop Museum Bulletin 157, 1938).

Hornell, James, *The Sacred Chank of India: A Monograph of the Indian Conch (Turbinella Pyrum)*, (Madras: Madras Fisheries Bulletin 7, 1914).

Howard, Keith, *Korean Musical Instruments* (Seoul: Se-Kwang, 1988)

Hyginus, Gaius Julius, *The Myths of Hyginus*, Fabula 274, translated and edited Mary Grant (Lawrence: University of Kansas Press, 1960).

Hyslop, Graham, *Musical Instruments of East Africa, I Kenya* (Nairobi: Nelson Africa, 1975).

Izikiwitz, Karl Gustav, *Musical and other Sound Instruments of the South American Indians* (Göteborg: Elanders, 1935).

Jackson, Wilfred, *Shells as Evidence of the Migrations of Early Culture* (Manchester: Manchester UP, 1917).

Jairazbhoy, Nazir Ali, *A Musical Journey Through India, 1963–1964* (Los Angeles: University of California Department of Ethnomusicology, 1988).

Jashemski, Wilhemina Feemster and Frederick G. Meyer, *The Natural History of Pompeii* (Cambridge: CUP, 2002.)

Jiménez, Raquel, Rupert Till, and Mark Howell (eds.), *Music and Ritual: Bridging Material and Living Cultures* (Berlin: Ekho Verlag, Publications of the ICTM Study Group for Music Archaeology, Vol. 1, 2013).

Kalicz, Nandor, 'A rézkori balatoni csoport Veszprém megyében', *A Veszprém Megyei Múz. Közleményei*, 8 (1969), 83–90.

—, *Die Péceler (Badener) Kultur und Anatolien – Studia Archaeologica 2* (Budapest: Akadémiai Kiadó, 1963).

—, 'Über die chronologische Stellung der Balaton-Gruppe in Ungarn', 131–65, in *Symposium über die Entstehung und Chronologie der Badener Kultur*, ed. B. Chropovosky. (Bratislava: Slovenskej Akadémie Vied, 1973).

Kaudern, Walter, *Musical Instruments in Celebes* (Volume III of his *Ethnographical studies in Celebes, 1917-1920*) (Göteborg: Elanders, 1927).

Kirby, Percival, *The Musical Instruments of the Native Races of South Africa* (London: OUP, 1934).

Kunst, Jaap, *Music in Java* (The Hague: Martinus Nijhoff, 3rd enlarged edition, ed. Ernst Heins, 1973).

Kunz, Ludvík, *Die Volksmusikinstrumente der Tschechoslowakei, Teil 1* (Handbuch der europäischen Volksmusikinstrumente I:2) (Leipzig: DVfM, 1974).

Kuss, Malena, ed., *Music in Latin America and the Caribbean; an Encyclopedic History* (Austin: University of Texas, 2004).

Landtmann, Gunnar, *The Kiwai Papuans of British New Guinea* (London: Macmillan, 1927).

Larsson, Karl Erik, 'The Conch Shells of Fiji', in his *Fijian Studies*, Etnologiska Studier 25 (Göteborg: Etnografiska Museet, 1960).

Leenhardt, Maurice, *Notes d'ethnologie néo-calédonienne* (Paris: Institut d'ethnologie, 1930).

Linton, Ralph, 'The Tanala, a Hill Tribe of Madagascar', *Field Museum of Natural History, Anthropological Series*, 22 (1933).

Maceda, José, *Gongs and Bamboo: a Panorama of Philippine Music Instruments* (Quezon: University of the Philippines Press, 1998).

Mahillon, Victor-Charles, *Catalogue Descriptif & Analytique de Musée Instrumental du Conservatoire Royal de Musique de Bruxelles* (Gand: Ad. Hoste, 1900; repr. Bruxelles: Les Amis de la Musique, 1978).

Martí, Samuel, *Alt-Amerika*, Musikgeschichte in Bildern II:1 (Leipzig: DVfM, 1970).

—, *Instrumentos Musicales Precortesianos* (México: INAH, 1968).

Mazār, Amīhāi, *Tel-Qasīle* (Tel Aviv: Museion Ha'Aretz, 1983).

Montagu, Jeremy, 'The conch in prehistory: pottery, stone and natural', *World Archaeology* 12:3 (February 1981).

—, *Horns and Trumpets of the World* (Lanham, MD: Rowman and Littlefield, 2014).

—, *The Shofar* (Lanham, MD: Rowman and Littlefield, 2015).

Moule, A. C., 'A List of the Musical and other Sound-Producing Instruments of the Chinese', *Journal of the North China Branch of the Royal Asiatic Society* 39 (1908), (repr. Buren: Frits Knuf, 1989).

Moyle, Richard, 'Conch Ensembles: Tonga's Unique Contribution to Polynesian Organology', *GSM*, 28 (1975).

—, *Tongan Music* (Auckland: Auckland UP, 1987).

—, *Traditional Samoan Music* (Auckland: Auckland UP, 1988).

Niles, Don, 'The Conchshell Band as Preserver of German and Papua New Guinean Lutheran Traditions.' *The World of Music* 40 (1988), 53–68.

Olsen, Dale A., *Music of El Dorado* (Gainesville: University Press of Florida, 2001).

Picken, Laurence, *Folk Musical Instruments of Turkey* (London: OUP, 1975).

Rees, Helen, *Echoes of History: Naxi Music in Modern China* (New York: OUP, 2011).

Reese, David S., 'The Late Bronze Age to Geometric Shells from Kition', Part II of Appendix VIII(A) in V. Karageorghis,

Excavations at Kition V/II (Nicosia: Department of Antiquities, 1985).

—, ‘Marine Invertebrates and Fossils’, Chapter 10 in C.-M. Bennett and P. Bienkowski, *Excavations at Tawilan in Southern Jordan*; British Academy Monographs in Archaeology 8 (Oxford: OUP, 1995), 93-96, and fig. 10.1 on p. 345.

—, ‘Marine Invertebrates, Freshwater Shells, and Land Snails: Evidence from Specimens. Mosaics, Wall Paintings, Sculpture, Jewelry and Roman Authors’, Chapter 13, pp. 292-315 in Wilhemina Feemster Jashemski and Frederick G. Meyer *The Natural History of Pompeii* (Cambridge: CUP, 2002.).

Roberts, Helen, *Ancient Hawaiian Music* (Honolulu: Bernice P. Bishop Museum, Museum Bulletin 29, 1926).

Rooney, Dawn F., *Khmer Ceramics* (Singapore: OUP, 1984).

Sachs, Curt, *History of Musical Instruments* (New York: Norton, 1940).

—, *Les Instruments de Musique de Madagascar* (Paris: Institut d’ethnologie, 1938).

Sáez Romero, Antonio M. and José M. Gutiérrez López, ‘Sounds for Gods, Sounds for Humans Triton Shell Horns in Phoenician and Punic Contexts from the Western Mediterranean’, Chapter 3 in Raquel Jiménez, Rupert Till, and Mark Howell (eds.), *Music and Ritual: Bridging Material and Living Cultures* (Berlin: Ekho Verlag, Publications of the ICTM Study Group for Music Archaeology, Vol. 1, 2013).

Seligman, C. G., 'New Guinea Trumpet', *Man* 1915:11.

Shawqī, Yūsuf, *Dictionary of Traditional Music in Oman* (Wilhelmshaven: Florian Noetzel, 1994).

Skeates, Robin, 'Triton's Trumpet: a Neolithic Symbol in Italy', *Oxford Journal of Archaeology* 10:1 (1991).

Stevenson, Robert, *Music in Aztec and Inca Territory* (Berkeley: University of California Press, 1968).

Talbot, Michael, 'Vivaldi's Conch Concerto', in *Informazioni e Studi Vivaldiani* 5 (1984).

Tanabe Hisao, *Nihon no gakki: Nihon gakki jiten* (Tōkyō: Sōshisha Shuppan, 1964).

Teffera, Timkehet, *Aerophone im Instrumentarium der Völker Ostafrikas* (Berlin: Trafo, 2009).

Thrasher, Alan, *Chinese Musical Instruments* (New York: OUP, 2000).

Tucker, Abbott R., and S. Peter Dance, *Compendium of Seashells, A full color guide to more than 4,200 of the World's Marine shells* (New York: E.P. Dutton, 1982).

Trần, Văn Khê, *La Musique Vietnamiennne Traditonelle* (Paris: Presses Universitaires de France, 1962).

Webb, A. J., *Observations on the hill tribes of Navitelevu, Fiji* (The Australasian Association for the Advancement of Science, Report 2, Melbourne, 1890).

Yuan Bingchang and Mao Jizheng, eds., *Zhongguo shaoshu minzu yueqi zhi* (Musical instruments of China's ethnic minorities) (Beijing: Xin shijie chubanshe, 1986).

Yupho, Dhanit, *Thai Musical Instruments*, transl. David Morton (Bangkok: Siva Phorn, 1960? – the date of Morton's preface).

Zahn, Heinrich, *Mission and Music: Jabêm Traditional Music and the Development of Lutheran Hymnody*, transl. Philip W. Holzknacht, ed. Don Niles (Boroko: Institute of Papua New Guinea Studies, 1996).

General Index

*Entries with lower-case initials and in italics
are local names for conches*

- Abruzzo, 14
Acoustic, 60
Afghanistan, 31
Alceste, 12
Alien, 66
Allen, Jim de Vere, 44
Ammann, Raymond, 124
Anapauo, 132
Andes, across the, 168, 180
Angkor period, 79
Animal-herding, 37
Anoyanakis, Fivos, 27
Antandroy people, 46
antsiva, 47
Ashtamangala, 73
Asmat trumpet, 110, 171
Assam, 59
Austral islands, 140
Australia, 106
Averting storms, earthquakes,
 etc, 39, 59, 105
Aztec, 156, 158, 161ff
Babylonian Empire, 178
Baden-Pécel people, 40
Balfour, Henry, 19
Bali, 97
Bangka Province, 97
Barbados, 185
Basra, 50
Bayer, Batya, 29
Beats between pitches, 65
Beaver, Wilfred Norman, 108
Békásmegyer II, 40
Belitung Province, 97
Belle Plaine, 154
Bellia, Angela, 21
Bernini, Gian Lorenzo, 17
Best, Elsdon, 142, 145
Bhagavat-Gita, 55, 70
Bharhut, 56
Bhima, 71
Bhuvaneshwar, 68
Binandere tribes, 108
biou, 38

- Bismarck Archipelago, 119
 Blackwater River, 110
 Blackwood, Beatrice, 120
 Blench, Roger, 50
 Boekelman, Henry, 151ff
 Bonanzinga, Sergio, 20
 Bonet Roig, Esperanza, 35
 Borneo, 99
 Borobodhur Temple, 97
 Boscoreale, 18
 Both, Arnd Andje, 156, 158ff,
 166
 Botticelli, Sandro, 19
 Bougainville, 120
bouroú, 27
 Brazil, 183
 Brockdorf Circle, the, 22
 Bronze Age, 24, 29
 Buddhism, Chapter 3 *passim*
 —, esoteric, 89
 —, Tantric, 61
 —, Ying Fo, 84
budyong, 95
 Burma, 75
Bursa unspecified, 43f, 47,
 Fig 2-1
Bursa bubo Linnæus, *see Tutufa*
 bubo
Busycon perversum (Linnaeus),
 see Sinistrofulgur perversum
 Cambodia, 77
 Cameo carvers, 19
 Campeche Bay, 156
 Cañete, 181
 Cape Nelson, 110
 Caribbean, 182
 Carmargue, 38
 Carnival, 19ff, 29, 185
 Caroline Islands, 132
 Carthaginians, *see* Punics
 Cassa Menandro, 18
Cassis cornuta (Linnæus), 47, 95,
 98, 104f, 114, 118, 120f, 126,
 133f, 137ff
Cassis tuberosa (Linnæus), 182,
 185, **Fig 6-7**
 Catania, 20
 Caverna della Arene Candide, 14
 Caverna della Pollera, 13
 Central America, 155
 Chalcolithic period, 40
 Chalyukan dynasty, 58
 Chang, Sa-hun, 87
chank, **Fig 3-1**, 53, 55ff, **Fig 3-2**,
 66ff, **Fig 3-4**, 71, 73, 75, 79,
 83
 Charivari, 37
 Charon, 12, 17
Charonia lampas (Linnæus), *see*
 Charonia nodifera
Charonia lampas rubicunda
 (Linnæus), 145, **Fig 5-9**

- Charonia nodifera* (Lamarck),
10ff, **Fig 1-1**, 23, 25, 27, 30f,
39, 42
- Charonia sequenzae* (Aradas &
Benoit), *see Charonia*
variegata
- Charonia tritonis*
—, as predator of starfish, 188
- Charonia tritonis* (Linnæus), 92,
119, 140
- Charonia tritonis* (Linnæus), 12,
84, 86, 89, **Fig 4-4**, 93, 96, 99,
104f, 114, 118, **Fig 5-5**, 120,
124, 126, 131, 137ff, **Fig 5-8**,
141, 147, 181f, 188
- Charonia* unspecified, 26, 32
- Charonia variegata* (Lamarck),
36
- Charonia variegata* (Lamarck),
11, 13, 15, 18, 28, 31, 33, 40
- Chasing beasts, 94
- Chavín culture, 167
- Chekiang, 83
- Chennai, 57
- Chiclayo, 167
- China, 83
- Chinnery, Ernest William
Pearson, 109
- chondothi*, 45
- Chorrera culture, 167
- Christmas, 21
- Chromatic scale, 116
- chundo*, 45
- chundo dodi*, 45
- Chuuk Archipelago, 132
- Circular breathing, 69
- Circumcision, 56, 129
- Clausen, Raymond, 122, 140
- Climbing poles, 129
- Cohen, Judith, 34
- Colima, 164
- Collingwood Bay, 118
- Colombia, 183
- Conca*, 39
- Concertino for Horn*, 123
- Concerto for Violin and Horn*,
123
- Concerts, 117
- Confucianism, 88
- Conus fergusonii* Sowerby, 168
- Cook, James, 142, 146
- corn*, 34
- Corsica, 38
- Cortés's men, 164
- Costa Rica, 182
- Creation myth, 162
- Crete, 16, 23ff, 28
- Cricket matches, 137
- Cuba, 184
- cucu*, 124
- Curanderos*, 180
- Curaçao, 184

- Curfew, 138
 Currency, 59
Cymatium parthenopium (von Salis), 12
 Cyprus, 27ff
- Dagon, 29
 Dai people, 85
 Daik-Lingga area, 98
 Deacon, Arthur Bernard, 123
 Delaware tribes, 153
 Demons, 176
 Dextral/Sinistral, 56
 Di Nocera, Gian Maria, 16
 Diettrich, Brian, 134ff
 Difference tones, 122
Dolium perdix (Linnæus), *see* *Tonna perdix*
 Dongba, 86
dun, 75
dung-dkar, 63, **Fig 3-3**
 Dunhuan murals, 85
- Ecuador, 166
 Edge-Partington, James, 142
 Edo period, 94
 Eivissa, 34
 El Niño current, 182
 Elba, 19
 Ellis, William, 46, 142
 Embouchure
 —, drilled, 114, 124
- , position, 115
 Ensembles, 116, 137
 Esoteric cults, 186
 Etruscans, 16f, 25
 Etzatlán, 164
 Evans, Sir Arthur, 25
 Experimental musics, 187
- Falmouth, 35
 Farm hands, calling to meals, 38, 58
Fasciolaria tulipa Linnaeus, 164
 Feasts, 141f
 Fefan Island, 132
 Fenépuszta, 40
 Ferndon, Edwin N., 141, 181
 Ferryman, 43
 Fiji, 126
Filifusus filamentosus (Röding), 118
 Fingerhole, 126, 159, 170
 Fiorini, Lucio, 17
 First-fruit ceremonies, 137
 Fischer, Hans, 105
 Fishermen, *passim*
 Flintoff, Brian, 145
 Fly River delta, 115
 Foghorn, 35, **Fig 1-2**
 Food from conch, 33, 59, 185
 Fukui, Hajime, 88ff
 Funerals, 46f, 86, 125, 137f, 141, 162

- Furst, Peter T., 155, 164, 167
fvf sse, 86
- Gadir, 31f
- Galpin Society, 91
- Galpin, Francis, 30
- Gambier Islands, 143
- Gansu, 85
- Geographical distribution, 1
- Gluck, Christoph Willibald, 12
- Good Friday, 21
- Great Plumed Serpent, 152, 158
- Grotto dei Piccione, 14
- Guaymí people, 183
- Guianas, 183
- Guizzi, Febo, 21
- Gulf States, 51
- Guna people, 182
gunda, 45
- Gunji, Sumi, 94
- Gunju, Sumi, 88
- Haġar Qim, 22
- Haghia Triada, 25
hai loa, 75
hailuo, 83
- Hala Sultan Tekké, 27
- Han people, 85
- Hand-stopping, 108, 113f, 117,
 121f, 124, 138, 164, 170
- Harrisson, Tom, 125
- Hartenberger, Aurelia, 63, 92,
 178
- Hawai‘i, 139
- Hazor, 29
- He, Xiudong, 86, **Fig 4-3**
- Hedin, Sven, 75
- Heian era, 89
- Hellenistic period, 29
- Hellfer, Mireille, 65
- Helmholtz resonator, 170
- Hemifusus colosseus* (Lamarck),
 75f, 83f, 86, 89, 93
- Herculaneum, 18
- Hexaplex nigrinus* (Philippi), 152
- Heyerdahl, Thor, 181
- Hickmann, Hans, 41
- Hilola, Te Rangi, 106
- Hilton, Lewis, 178
- Hindu-Javanese period, 96
- Hinduism, Chapter 3 *passim*
- Hohokam, 149ff
- Hokakuji temple, 89
- Holmes, Peter, 16
- Holy Week, 15, 18, 20
- Hopewell Tradition, 149
horagai, 88
- Hornell, James, 38, 55ff, 70
- Hospital scanner, 79
- Howard, Keith, 88
- Huichol people, 166
- Human sacrifices, 141

- Hyginus, Gaius Julius, 16
 Hyslop, Graham, 43
- İçel, 27
 Idaean Cave, 24
idudi, 45
 Inca culture, 177
 India, Chapter 3 *passim*
 —, definition, 53
 Indonesia, 96
 —, and Africa, 49
 Iron Age, 29
 Ischia, 19, 38
 Izikowitz, Karl Gustav, 180, 183f
- Jackson, Wilfred, 24, 35, 37f
 Jairazbhoy, Nazir Ali, 68f
 Japan, 88
 Java, 96
 Jazz, 187
 Jezebel, Queen, 30
 Jívaro people, 180
 Johnson, Henry, 88, 94
- kabuk*, 27
 Kalachakra, 63
 Kamposan, 90
 Kampuchea, 77
 Kartomi, Margaret, 97
 Kaudern, Walter, 96
kele'a, 136
 Kenya, 43
- Kephala, 16
 Khmer people, 79
 Kilifi, 43
 Kinpusenji Temple, 90
 Kirby, Percival, 49
 Kitane, 33
 Kition, 27
 Kitsos Cave, 27
 Kiwai people, 115
 Knossos, 23, 26
 Koch, Lars-Christian, 60, 82, 175
 Kolkata, 60
kome, 99
 Korea, 86
 Koryō period, 88
 Krishna, 55, 71
 Kronos, 24
 Kunst, Jaap, 96
 Kunz, Ludvik, 39
 Kurtatchi village, 120
 Kuss, Malena, 184
 Kythera, 27
- Lacandon people, 166
Lambis lambis Linnæus, 141
Lambis truncata sebae (Kiener),
 30
 Landtmann, Gunnar, 115
 Langa Langa lagoon, 120
 Larsson, Karl Erik, 128
 Lasalle, Emille, 141
lavai, 75

- Leenhardt, Maurice, 124
 Liguria, 13
 Linton, Ralph, 47
Lobatus, 167
Lobatus costatus (Gmelin), 159
Lobatus galeatus (Swainson),
 152, 167, 179
Lobatus gigas (Linnæus), 19, 45,
 153, **Fig 6-1**, 157, 163f, 182
 Logan, Robert and Mary, 132
 Loyalty Islands, 124
 Lumsden, Alan, 66
lungga, 95
- Maceda, José, 95
 Madagascar, 45
 Madonna, Nativity of, 19
 Mafia Island, 47
 Magic, 46
Mahābhārata, the, 70
 Mahillon, Victor-Charles, 38, 76,
 84
 Maki ceremony, 122
 Malaita Island, 120
 Malaysia, 84, 99
Malea ringens (Swainson), 168,
Fig 6-6
 Malekula, 121ff
 Mallia, 23, 26
 Malm, William, 94
 Malta, 22
 Manchu people, 85
- Mangareva Island, 106, 143
 Manipushpaka, 71
 Mao, Jizheng, 85
 Māori people, 145
 Maranhão, 183
 Marano, Francesco, 16
 Marchand, Etienne, 141
 Marquesas Islands, 139, 181
 Marsoulas Cave, 10
 Martí, Samuel, 157, 159
 Maundy-money, 58
 Mauritania, 33
 Maya culture, 159
 Mayoruna people, 180
 McGraw, Andy, 97
 Measuring the pitch, 4
 Medicine, 58
 Megiddo, 29
 Megula Pevkakia, 27
 Melanesia, 101, 107, 120, 122,
 124, 126, 132
Melongena patula (Philippi), 152
 Melos, 27
 Merioneth, 38
 México, 155ff, 161ff, 166
 Micronesia, 101, 132, 134, 136
 Missionaries, 116, 132
 —, eradicating native practices,
 130, 163
 Miyamoto, Yoshihiro, 93
 Moche culture, 168

- Modern usage, 186
 Mongolia, 75, 85
 —, Inner, 85
 Monk, Christopher, 66
 Monneron, Pierre, 145
 Montagu, Aviad, 166
 Morgantina, 21
 Motya, 31
 Moule, Arthur Christopher, 83f
 Mound builders, 149
 Mouthpiece, added, 18, 20, 39,
 56, 63, 90f, 93, 105, 140ff,
 145f, 157
 Moyle, Richard, 136
 Mtwapi, 43
Murex nigrinus (Philippi), *see*
 Hexaplex Nigrinus
Murex tritonis (Linnæus), *see*
 Charonia tritonis
 Mycenæ, 26
 Myrtos, 23, 26

na-gag, 86
 Naga people, 59
nagak, 88
 Nakula, 71, 73
 Nanman people, 84
 Nara, 89
 —, period, 88f
 Navigation, 134
 Naxi people, 85f
ndavui, 129

 Negrito people, 95
 Neolithic period, 10, 13ff, 23f,
 27, 32
 New Britain Island, 118
 New Caledonia, 124
 New Guinea, 107
 New Ireland Island, 119
 New York, 50
 New Zealand, 143
 Night watchmen, 84, 146
 Niles, Don, 114ff
 Nineveh, 30
 Niutopotapu Island, 137
 Nokopo, 116
 North America, 149ff
 Notation, 66, 90, 108, 116f, 135
ntoea-nteoangi, 96
 Nukuhiva Island, 141

 Oakley, Sir Kenneth, 22
 Oceania geography, 101
 Olmec culture, 156
 Olokun, 50
 Olsen, Dale, 176, 180
 Oman, 51
 Orang Suku Laut people, 97
 Ösel, 13

 Paez people, 183
 Palaikastro, 26
 Palau Archipelago, 134
 Panama, 182

- Panchajanya, 71
 Pandava brothers, 71
 Pandiyan dynasty, 58
 Papua New Guinea, 107
 Parvati, 55
 Paundra, 71
 Peake, John Fordyce, 120
 Peloponnese, 28
 Peristeria, 16
 Persia, 31
 Peru, 167
 Phaestos, 23
 Philippines, The, 95
 Phoenicians, 31
 Picken, Laurence, 27f
 Piedigrotta, 19
 Piedmont, 19
 Pitt Rivers Museum, 19, 35, 44,
 84, 118, 120, 123, 143
Pleuropoca filamentosa
 (Röding), *see Filifusus*
filamentosus
Pleuropoca gigantea (Kiener),
see Triplofusus gigantea
Pleuropoca princeps (Sowerby),
see Triplofusus princeps
 Plzeň, 39
 Poggio dell'Impiccato, 16
 Pohnpei, 135
 Poindimié, 124
 Polynesia, 101, 136, 138f, 142f
 Pompeii, 18
 Poseidon, 12, 24
 Poso Toradja people, 96
 Pottery conchs 'special', 81
 —, *see also*
 SkeuomorphsPregnancies,
 120
pūmoana, 143
 Punic, 31
pūtātara, 143
pututu, 178
 Qinghai, 85
 Quechua people, 181
 Quetzalcoatl, 158, 162
 Red Sea, 43, 45
 Reese, David S., 18, 26f, 30
 Resonating the reef, 122
 Resonator, 162
 Rhodes, 26
 Riau Islands, 98
 Rikitea, 143
 Ritual, a danger, 82
 Roberts, Helen, 139
 Romans, 178
 Rooney, Dawn F., 80
 Runners, 178
 Sabadell, 34
 Sabah, 99

- Sachs, Curt, 45f, 55, 104, 115, 119, 131
 Sahadeva, 71
 St Thomas Island, 184
 Samoa, 138
sāng, 76
 Santa Isabel Island, 121
 Santander, 34
 Saponara, 20f
 Sardinia, 31
 Seligman, Charles Gabriel, 110
Semifusus colosseus (Lamarck),
see Hemifusus colosseus
 Semporna, 99
sewi, 135
 Shanghai, 83
 Shinto, 94
 Shiqmona, 30
 Shiva, 55
 Shrove Tuesday, 20
 Shugendo sect, 89
 Sichuan, 85
 Sicily, 19
 Signals on one pitch, 108
Sinistrofulgur perversum, 151
 Skeates, Robin, 13ff, 23, 27
 Skeuomorphs, 25, 59, 78, 132, 157, 160, 164, 168f, 172, 174, 176
 Skyros, 28
 Smythe, Ethel, 123
 Snaketown, 152
 Soldiers, 84, 89
 Solomon Islands, 120
 Somalia, 43
 Song period, 82, 85
sora, 86
 South America, 167, 182
 Sri Lanka, 73
 Staffordshire, 37
 Stevenson, Robert, 176
Strombus costatus (Gmelin), *see Lobatus costatus*
Strombus gigas (Linnæus), *see Lobatus gigas*
Strombus lambis Linnæus, *see Lambis lambis*
 Su Carropu, 16
 Sucked, not blown, 106
 Sughosha, 71
 Suku Sekak people, 97
 Sulawesi, 96
 Sulky, 31
 Sumatra, 98
sungu, 97
 Swahili people, 44
 Swiss Cantons, 15
Syrinx aruanus (Linnæus), 104, 112, **Fig 5-4**, 114
taburi, 95
 Tahiti, 105
 Tahuata, 141

- Taino people, 184
 Tamuda, 33
 Tanabe, Hisao, 94
 Tanala people, 47
 Tang period, 82, 85
 Tanzania, 43
Tavur, 118
 Tawilan, 30
 Taylor, John, 174
 Teffera, Timkehet, 44
 Tel Nami, 29
 Tel Qasile, 29
 Tenochtitlan, 162
 Teotihuacán culture, 157f
 Thailand, 76
 Thera, 26
 Thrasher, Alan, 85
 Thym, Nancy, 133
 Tibet, Chapter 3 *passim*
 —, definition, 54
Tibia fusus (Linnæus), 71, 73
 Time marker, 66
 Tlatilco culture, 156
 Toctezuma, Emperor, 164
 Todaiji Temple, 89
 Toltec culture, 161
 Tonga, 136
Tonna perdix (Linnæus), 26
 Torquemada, Juan de, 164
 Torres Straits Islands, 107
 Tosontsengel, Dalaimergen, 75
 Trần, Văn Khê, 75
 Travancore, 58
 Travellers, peaceful, 180
Triplofusus gigantea (Kiener), 159
Triplofusus princeps (Sowerby), 157
 Tritons, 12f, 17, 24, 55
 Trobriand Islands, 110
Trochus niloticus Linnæus, 71,
Fig 3-6
trompet siput, 99
 Tuamotu islands, 140, 142
tuang-tuang, 98
 Tubuau island, 142
tulabhāra kasu, 58
 Tupinambá people, 183
Turbinella pyrum (Linnæus), 75ff, 79, 84
Turbinella pyrum (Linnæus)
et passim, 53
Turbo marmoratus (Linnæus),
Fig 3-5, 71
 Turnbull, Steven, 174
 Tusayan Pueblos, 152
 Tuscarora township, 153
tutu, 124
Tutufa bubo, 114, 118, 126, 131f
 Tyrrhenus, 16
 Uapou island, 141
 Uc-Zip, 161

- Upper Paleolithic period, 1, 10
- Valdivian culture, 166
- Vanuatu, 122
- Vedas, 55f
- Venezuela, 183
- Vessel trumpet, 170
- Vietnam, 75
- Vishnu, 55, 71
- Vishnupur, 59
- Viti Levu, 126
- Vivaldi, 39
- Voice-changer, 104
- Waechter, John, d'Arcy, 53, 67
- Wales, 37
- Waputki Pueblo, 152
- Warao, 183
- Warfare, 85, 94, 108, 128f, 136ff, 146f, 180
- Waterhouse, William, 90
- Weber, Carl Maria von, 123
- Weddings, 81, 138
- Wenxian tongkao*
(Comprehensive Examination of Literature), 84
- West Indies, 182
- Wetterhorn*, 39
- Wooden trumpets, 108, **Fig 5-2**
- Yamabushi, 94
- Yamaguchi, Patricia Matusky, 99
- yim (jim)*, 51
- Ying Fo, 84
- Yoruba people, 50
- Yuan, Bingchang, 85
- Yunnan, 85
- Yupho, Dhanit, 76
- Zahn, Heinrich, 116
- Zeus, 24
- Zuñi people, 152