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A studio photograph of the late nineteenth century showing a man dressed in a malo loincloth and isala turban, beating a lali. The beaters, while typically shaped, are rather large for a drum of this size. The walls of the drum are thinner than those of lali made on Namuka today.

## LALI - THE DRUMS OF FIJI

BY ROD EWINS

The drum or gong of Fiji, the lali, has been well described as 'A large gong ... varying in length from two to six feet according to the seniority of the chief living in the village where it is used, and ... found in most villages. It is carved from the solid in a shape which resembles a very short canoe cut off abruptly at each end. It has thick sides, is open along the top, and in cross-section is bellied out between the top and the base. A few inches of timber project beyond the ends of the large resonance chamber ...' [1]

The lali is most commonly encountered by visitors to the islands today as an apparently mandatory ornament of tourist hotels. Those more attentive to form will have a pair, one larger and one smaller, sometimes housed in their own little shelter. They may be used as dinner- or sunset-gongs, but occasionally the drummers will display skill in beating the drums in tandem to produce very attractive rhythms. At such times more sensitive listeners may get a hint of the original significance of the lali, and by closing their eyes may in imagination travel beyond the manufactured environment of swimming pools, plastic smiles and imported food, and come a little closer to what remains of the 'real' Fiji.

It is probable that in pre-European times the lali was made in a greater number of places than it is today, and like virtually all craft manufactures in Fiji it was certainly once the speciality, or yau, of specific localities. In dealing with a culture in which most crafts show affinities with those of neighbouring regions it is necessary to be cautious when assigning Fijian origins. This is especially true when speaking of woodcrafts, for some of the most 'typical,' such as the manufacture of the great drua sailing canoes and wooden tanoa or yaqona bowls, have proved to be dependent upon recently immigrant Samoan Lemaki and Tongan Jafau craftsmen. The lali, however, was probably indigenous - which is to say that its origins probably date back to much earlier immigrants. Nothing in its form, or as far as I am aware, in the literature, suggests that it was among the articles introduced and/or developed by the recently arrived Polynesian craftsmen of the eighteenth and nineteenth centuries, although Rev. Thomas Williams, writing in the mid 1800s, certainly considered that by that time Tongan craftsmen were making more shapely drums (see Fig.1, opposite).

The islands of Lau i Cake, or Southern Lau, are justly famed for the diversity and excellence of their various yau, including both male and female crafts. Among male crafts the chief ones that persist are the making of sinnet or coconut-

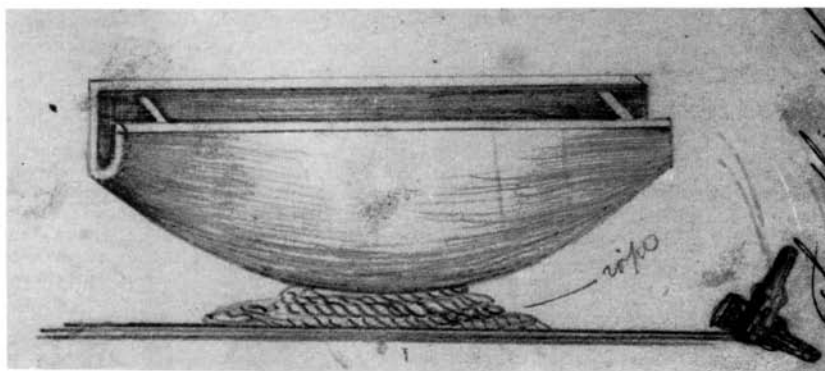


Fig. 1: Rev. Thomas Williams' sketch of a 'Feejeean drum,' resting upon a coil of rope. In the margin he noted that 'The outline of this drum is too smart for one chopped by a Feejeean, but I have seen one Tongese who used to cut them with an outline as pretty as this and even prettier.' From Thomas Williams, Rough sketches of places, persons, & things for the most part Feejeean. Somosomo, 1844. Courtesy of Mitchell Library, Sydney.

fibre cordage (magimagi), and the working of timber. Indeed the manufacture of tānoa and drua, mentioned above, has always been primarily, though not exclusively, the province of these particular islands. This is in large part due to the fact that the rather arid limestone islands are rich in the giant, durable and formerly sacred vesi (Intsia bijuga) tree, which in turn meant that it was to Lau above all other places that the Samoan and Tongan canoe craftsmen came. It should not, however, be concluded that there were not skilled woodcraftsmen in the region prior to the relatively late arrival of these Samoans and Tongans. There are still in a number of islands clans of mātai woodcraftsmen whose oral traditions place them there earlier than the eighteenth century immigration of the Lemaki, and the nineteenth century immigration of the Jāfau.

Among those islands of Lau i Cake noted for their woodcraftsmen, there is a further recognised entitlement, amounting virtually to a patent, to the manufacture of specific items. Kabara, formerly a major centre for the manufacture of double canoes by its Samoan-origin craftsmen, predictably still dominates the making of tānoa and other wooden bowls of essentially Samoan or Tongan design. Vulaga is the only island which still regularly produces sailing canoes, which remain in use throughout this part of Fiji. Ogea is renowned for its wooden kumete bowls and dishes, particularly the long round-ended or sometimes sharp-ended troughs called there papasia [2]. Namuka, famous for the unsurpassed masi bark-cloth of its women, is also important as the Lauan centre for the male craft of carving lali [3].

It was on Namuka during August 1985 that I watched lali being made, from the felling of the giant vesi tree to the testing of the almost-finished drum. The mātai who generously showed me his craft was Easi Qalo, aged 41, who lives in the resettled old village (koro makawa) of Nasau, a couple of hundred metres east along the coast from the village of Korolevu [4]. His knowledge of the craft and some of his tools are a legacy from his father. I did not meet, but was told of another noted lali-maker, Sitiveni Reki of Korolevu. There may

be other experts, but they were not mentioned to me. The paramount chief of the island, Tui Namuka, Rātū Mosese Fotuwaika, though not a lali-maker, owns tools handed down by his grandfather, Rātū Waqa Noa.

#### CARVING THE LALI

Lali are made from extremely dense, acoustically resonant timbers. This, together with their size and form, effectively limits the choice of tree to three - dilo (Calophyllum inophyllum), tavola (Terminalia catappa), and vesi. Today the last is the most favoured, particularly on Namuka, where it grows naturally in the dense, vine-shrouded forests which still cover parts of the island. Principal source areas mentioned were Lekutulevu (about a mile WNW of the village and where I saw lali being made, Daku and Walata in the interior, and Muani-vanua, the eastern tip of the island.

Vesi favours limestone, and the roots of the tree Qalo felled embraced an exposed jagged limestone outcrop. The tree stood about twenty metres tall, and was about three metres in circumference at the base. It is virtually impossible to date trees where there are no clear seasons, but where periods of drought and rain determine 'annual' rings. Vesi is extremely slow-growing, however, and the tree may well have been over a thousand years old. The old men told me that at the turn of the century virtually the whole interior had been densely forested, but great areas had then been cleared and burnt off to establish coconut groves for copra production. Today's depressed copra prices point to the short-sighted nature of this destruction, particularly when, as in 1985, the always-dry island suffers prolonged drought which kills coconut trees but does not harm the native forest. Replanting of vesi, as in the case of that other wastefully exploited ancient of the Fijian forest, the dakua (Agathis vitiensis), is simply impractical in view of its growth period, and certainly the people of Namuka give it no thought. I saw few vesi growing in the forest on Namuka, and with even a modest rate of use their days are obviously numbered. Their previous 'sacred' status and consequent severe limitation on their use was a far better conservation device than anything used today.

Formerly, of course, all of the felling of trees and shaping of the drums would have been done with stone adzes - matauvatu and isivi. These were arduous to make and required constant sharpening, while their raw material meant it was impossible to form a slim, efficient cutting tool. Understandably therefore, iron and steel axes and hatchets were eagerly sought from the time of first contact with Europeans. Food for thought for all students of Fijian culture, however, is the fact that the old wooden artefacts in museum collections, made with stone implements and fish or mammal teeth and finished with coral rasps, shell 'planes' and sand, are invariably more beautifully formed and better finished than any made today by the descendants of the old craftsmen, using technically superior tools.

Today the trees are felled (taya) with chainsaws. There are a number on the island, purchased or obtained as gifts under a government 'rural youth' scheme. Favoured are very heavy duty saws with cutting bars a metre or more long. I was told that the usual problem with any form of technology in the islands, that of maintenance, prevails on Namuka, where there is not so much as an amateur mechanic. Sharpening tools is a favourite village pastime so the life of chains must be short. Correct use of such lethal machines is another skill for which instruction is lacking, and in one incident I saw in the village, only the great strength of the young man concerned prevented totally incorrect use of the saw from having disastrous consequences.



Fig. 2: Easi Qalo with the trunk of the vesi he felled. Two lali and a length of waste had already been cut from the trunk. Note the great amount of heartwood relative to the small 'rind' of sapwood.

Notwithstanding these problems, chainsaws are much easier to use than even steel axes for cutting down hardwood trees, and when felled the thick straight trunks can be easily sawn into appropriate lengths (uma) for making lali. Length is dictated by the girth of the trunk, as there is an acoustically desirable proportion for the drum, correct judgement of which is crucial to ultimate resonance. Rev. Deane, writing in 1921, described what must have been a beautifully proportioned and quite massive lali: 'I have measured one nine feet long, three feet six inches high, and two feet ten inches thick. A man stood inside to beat it. It was responsive to the lightest tap, and when beaten loudly was heard at a distance of ten miles as the crow flies, although mountains intervened. It was quite common to hear the beat of a large lali at a distance of seven miles, and from three or four miles over a high range of mountains.' [5]



Fig. 3: Beginning the flattening - cicikete - of the top (ketena) of the lali. The stump of the parent vesi can be seen in the background, with its roots growing round a limestone outcrop.

In former times, Deane wrote, 'the cutting of a new lali is always a great occurrence. When it is being taken on a canoe to its destination, it is beaten all the way, though it may be twenty miles, and the natives along the coast know therefrom that a town somewhere near is receiving a new drum.' [6]. On Namuka today no particular importance attaches to the event. I asked whether there were any ceremonies, propitiation rituals (since the vesi was a sacred tree), or other markers of the event, but was assured there are none, and that they knew of none historically. Whether or not the making of lali ever had special moment on Namuka, today it is merely regarded as a job, and transport to the drum's new owners will most probably be done very matter-of-factly on the M.V. Kaunitoni or some other of the trading vessels which ply between the islands of Lau and the port of Suva.

Apart from the chainsaw, the craftsman uses hand-tools only. Qalo's toolkit consisted of:

1. Two everyday store-bought felling axes (called vulaono - literally 'six months,' an axe formerly being earned by six month's labour!).
2. A hatchet (tabadua - 'one armed'). He mentioned this tool, but I did not see it used.
3. An adze made from an ancient broad-bladed edging-axe (called valevatu - 'stone-house' [?], after a large type of stone adze), lashed to an elbow of tough dilo with sinnet, exactly like the old stone-bladed adzes. Valevatu axe-heads were brought to Fiji last century. No longer obtainable, they are prized heirlooms. Some possibly saw service as battle-axes before being converted





Fig. 4: Two lali in progress, with the craftsman's tools displayed. In order away from the viewer these are: 1 & 2, Felling axes - vulaono; 3, adjustable gouge-adze - cālocālo; 4, broad-axe hafted as an adze - valevatu; and 5, hole-tanged adze - tabumagimagi.

to this more peaceful use. Battle-axes were sometimes called valevatutiviti - tiviti meaning 'in profile,' or 'set on edge,' and referring to the upright, not crosswise, placing of the blade. They were favourite weapons last century. [7]

4. A standard curved adze with a pierced tang (called tabumagimagi - 'without sinnet' as the handle is housed in the tang and not bound on as in the case of the old Fijian stone adze blades).

5. A most ingenious and original tool, the cālocālo (cālova - 'to hollow out a cavity'). To make this a big (about 7-8cm. wide) store-bought gouge has had its tang and shoulders housed into the side of a small block of boca (Manilkara

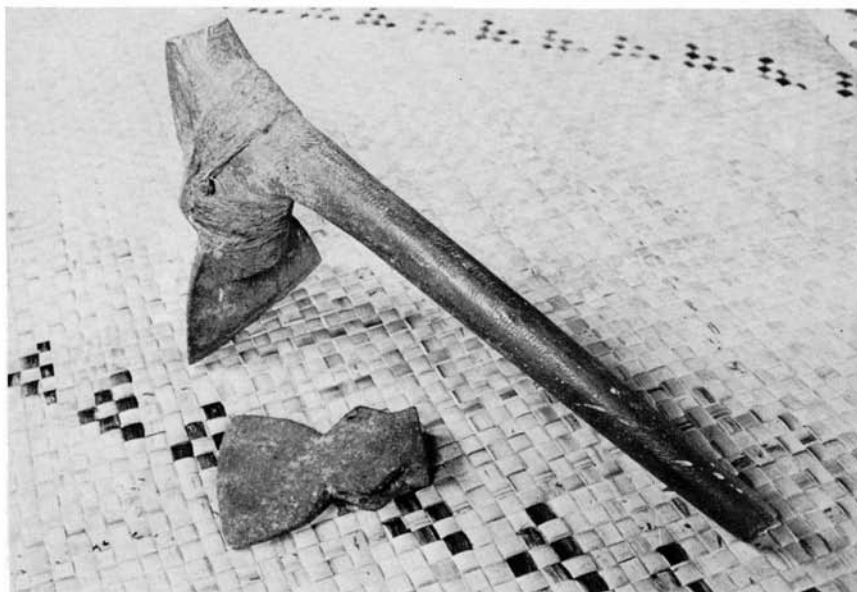


Fig. 5: The valevatu belonging to Tui Namuka. The head of a smaller broad-axe lies on the mat. This is the preferred side-axe, with the eye offset to the blade, which is flat on one side and concave on the other. In this case the blade lies concave side up. Blades of this type are fitted to the adze-handle with the concave side inward, thus facilitating the downward arc-stroke of the adze.

vitiensis), a very hard wood used on Namuka for house-posts. This block comprises the head of the tool, and is cunningly articulated to an elbow-type adze-handle of dilo wood. It is lashed with very heavy breaking-strain nylon fishing-line in place of sinnet, so as to permit the head to rotate about 60° to either side. The one tool can thus be used as a normal adze or a side-adze, invaluable where so deep a cavity (titobo) must be worked.

Preliminary shaping of the log is done in the forest where the tree has been felled, using the felling-axe and valevatu. First the side of the log that is to be the top (ketena) of the lali is chopped along its length with the axe, and then adzed flat with the valevatu - the whole process is called cicikete. The outsides are then shaped with the same sequence of tools - this shaping being called umani na lali (cf., uma, above). The hollow interior (loma ni lali) is roughly chopped out (tuki dreke), reversing the order of tool use - the edges of the cavity are marked into the flat surface of the ketena with the valevatu, which is easier to control, and then the heavy chopping is done with the axe.

When the basic form of the lali has been established, and the weight of the log considerably reduced by the removal of waste from both the sides and the



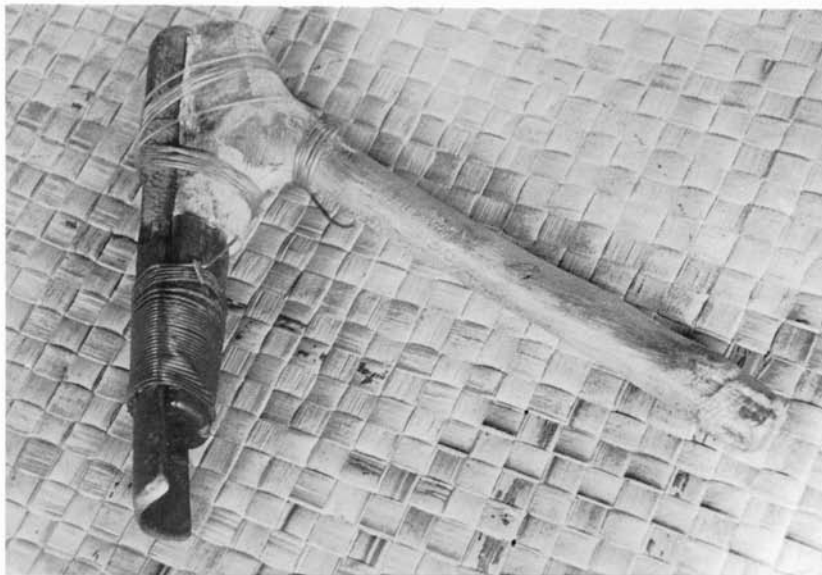


Fig. 6: The cālocālo of Sītiveni Reki. The mechanics of the tool are evident. The dark timber piece, the blade-holding block, has a cylindrical upper section, shouldering out to a broad lower section. The gouge-blade is housed firmly into the front of it and bound with copper wire. The blade-holding block is then lashed to the elbow of the adze-handle with heavy nylon fishing-line - the front face of the elbow having been hollowed to accommodate the cylindrical section of the holder. The shoulders of the blade-holding block buttress against the square-cut end of the elbow, and while tightly bound the blade-holder and blade may still be rotated about 60° in either direction prior to use.

interior, it is carried back to the maker's home to be completed at leisure. This carrying (colaji) is done by roping two stout poles (ivua) along the sides of the lali, one on each side, and carrying it in the manner of a sedan-chair on the shoulders of two or four strong men. When it is remembered that even a fully dressed and seasoned lali is heavy for two strong men to shift, it can be realised that to carry the roughly formed, green-timber drum for a mile or more (as is normally the case) is no mean feat.

Finishing of the cavity is done principally with the tabumagimagi and the cālocālo. The sides and underneath of the 'belly' (dago ni lali) are adzed to a good shape and reasonable finish. These steps, which have no specific name, are simply called cālova vakavinaka ('to hollow out to a good finish') and sisivi vakavinaka ('to adze to a good finish').

As quoted at the beginning of the article, Roth noted that 'A few inches of timber project beyond the ends of the large resonance chamber but only, I think, for ornamental purposes.' [8]. This 'extension' is achieved by letting-in a



Fig. 7: Beginning the tuki dreke - chopping out the interior of the lali. The valevatu is being used to 'set out' the shape of the cavity. The offset form of the edging-axe blade is evident in this photograph. As can be seen, the flattening of the top of the lali (cicikete) has been completed and the outside shape has also been established (umani).

short recess into either end, which exactly continues the interior line of the drum wall, being separated from the resonating chamber by a stout straight-sided baffle - the domo ni lali ( the 'neck,' or possibly 'voice,' of the drum). Today the chainsaw, with its round-ended bar, is ideal for creating the end recess while simultaneously creating the outside face of the domo ni lali.

Roth's belief that the projection of the horseshoe-shaped wall beyond these baffles is purely ornamental, while probably close to the truth, should perhaps be tempered a little. The projection probably does affect in some degree the



Fig. 8: Continuing the tuki dreke with the felling-axe.

vibration of the walls when struck, and thus the resulting sound-waves. The degree of this could only be determined by first measuring the acoustic qualities of a drum, then cutting off the projections before re-measuring. I have not done so, and cannot imagine being able to bring myself to perform so destructive an experiment. While on the subject of the 'baffles,' it is worth noting that on some lali the top edge of these lies a couple of centimetres below the level of the rim of the drum wall, and may well arc down even lower. On all the Namuka drums I saw, however, the top edges of the baffles were slightly convex, starting about a centimetre below the rim at the edges, and rising to be virtually level with it in the centre. Their height and shape probably has some effect on sound overtones, but it would be very difficult to accurately measure this. [9]

At this stage, before final finishing, the lali is tested for sound. To enable this, it must be properly 'set-up' by placing it upon two short lengths of



Fig. 9: With the interior well established, the hole-tanged adze (tabumagimagi) is used to form the bottom of the trough.

coconut trunk. placed across the drum about a quarter of the way in from either end. These supports are called lago - as are canoe-rollers. Roth mentioned drum supports: 'In order to ensure the maximum production of sound and a good tone the gong is sometimes placed on a circular stand made of a stout bush creeper or at least supported on each side of the centre of the base; it is not in accordance with custom to set the gong directly on the ground as is often done nowadays.' [10]. This use of a coil support was also illustrated by Williams last century (Fig. 1; note 11), but though I have travelled through most parts of Fiji I have never seen it, and imagine it must now be obsolete, replaced by lago, or in many cases, as Roth noted, omitted altogether. It should be realised, however, that even in the past lali were often simply placed directly on the ground to beat. But where they were placed upon a supporting coil,



Fig. 10: The sides of the trough are worked with the cālōcālo, with its blade rotated to one side. A normal adze could not function in this space.

I would expect that the vine or rope being less dense than coconut trunk lago, coupled with the fact that the coil created an enclosed cavity under the drum, must have influenced the quality of sound, as does simply lying the lali on the ground without support. Theoretically, for minimal interference with vibration the lago should be placed exactly under the baffles, which are already creating a node in the sound-wave. In most of the cases I have seen they have been positioned slightly closer to the centre of the drum than this.

Testing merely consists of beating some simple rhythms on the drum, and if the sound is clear and penetrating it is judged good. If the sound is muffled, it being impossible to put back material, adjustment can only be made by judiciously carving more out of the resonating chamber and off the domo ni lali,







Fig. 11: Easi Qalo testing two almost-completed drums. These were not a pair, being both almost the same size, and destined to be the large partners of two separate pairs. Their smaller mates were to be made later, in suitable size and proportion for use with these large drums. The beaters are not properly formed yavayava, but roughly-made ones used simply for sound testing. Note the coconut-trunk lago, and the form and position of the 'end baffles' (domo ni lali).

thinning the walls and altering the quality of the vibration (both changing the tone and slightly raising the pitch) when the wall is struck, and also changing slightly the distance between which the walls are 'fixed,' the wave length, and accordingly the pitch, of the drum.

When the lali is considered acceptable, the outside is finished off with an everyday smoothing plane (itoci). Formerly, I was told, it was scraped smooth

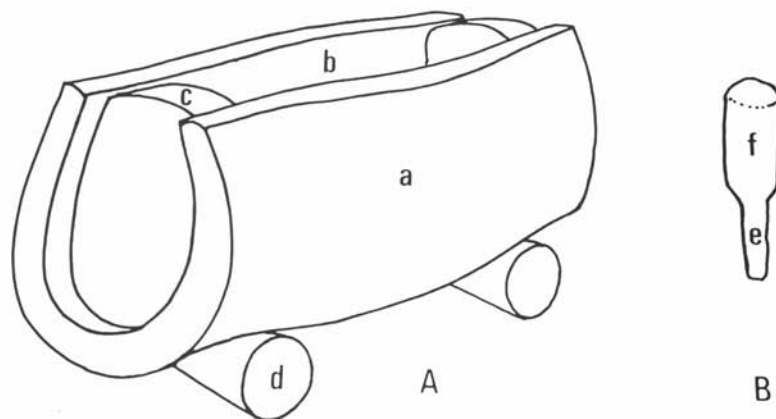


Fig. 12. A: Lali. a. Dago ni lali - body of drum. b. loma ni lali - interior of drum. c. Domo ni lali - neck of drum. d. Lago - supports. B: Yavayava - beater. e. Diana - handle. f. Uluna - head.

(kaki) with a seashell, possibly the vuro cone (*Conus leopardus*), which has a sharp lip and is still used for various scraping purposes. [12]. These days no attempt is made to finish the inside surface of the resonating chamber beyond the rather rough 'dimpling' left by the calocalo, though Qalo readily agreed that old lali were often as smooth inside as out. Since this must affect the internal reverberation of sound, current practice would seem to be degenerate, but should be seen more as an indication of the reduced role of the lali today and lack of need for the far carrying power of its beat than as laziness.

Each drum has two beaters or drumsticks, called yavayava at Namuka (yava means 'leg,' and yavayava is used for pigs' trotters and poultry drumsticks, but I cannot offer any secure linguistic basis for the use of this name). Elsewhere in Fiji lali beaters are often called iuaua, and this name 'is said to have been taken from the rhythm produced in beating the gong in the same way that a pulse can be seen beating in an artery, the name for which is ua.' [13]. The beaters are made in a size suitable for the particular drum, and at Namuka today they are both the same size for any given drum, though this is not always the case elsewhere in Fiji (F. Clunie, pers. comm.), and apparently was not always the case in the past. An engraving from the mid nineteenth century (Fig. 13, overleaf), meticulously accurate in its other details, shows a drummer holding a typical yavayava in his right hand, and a lighter one - a straight stick - in his left. [14]. There is possible logic to this arrangement. Many lali beats require one beater to be struck much more lightly to produce a quieter and less penetrating note. The lighter stick produces a similarly pitched note to that of the heavy beater if struck with the same force, but it is not so loud and penetrating, and because it emphasises different overtones has the effect of seeming to be higher-pitched. The use of beaters of different weights would inherently provide some variation in the volume, and thus the carrying power, of the total beat, and an apparent difference in pitch. If however the small beater were to strike the drum near to the baffle, the difference in



FEEJEE DRUMMER.

Fig. 13: A wood-engraving of a lali-drummer, made from a drawing of the U.S. Exploring Expedition, which visited Fiji in 1840. Note the typically recessed 'end-baffle' which is, however, lower than is the case with Namuka lali today. Note also that the drumsticks are of differing size, so that two notes would be struck from the one drum.

pitch would be actual, not just apparent, with the overall effect of higher notes 'ornamenting' the fundamental deep note providing the basic rhythm. Lighter sticks can also be made to bounce to deliver a double-note, further elaborating the drum beat (Clunie, pers. comm.).

Yavayava have stout cylindrical heads which taper sharply to straight, cylindrical handles. They need to be made of wood that is much softer than the lali to avoid damage to the lip of the drum, on which they are struck. Woods most frequently used are the sikeci candlenut (*Aleurites triloba*) [15], and sinu (*Phaleria disperma*). One drum will outlast countless pairs of beaters. A perhaps rather atypical demonstration was, however, recorded by Sir Arthur Gordon in 1876 from Vatulā on the Ruailevu (Sigatoka) River. An alarm was sounded by members of the Armed Native Constabulary, who beat with such urgency that they 'succeeded in breaking no end of drumsticks and smashing more than one lali.' [16]

Qalo asserted that it was wrong to make single lali, they should always be in pairs - one large and deep-pitched, its mate smaller and higher-pitched. Certainly in Lau this is normal, but in many parts of Fiji single large or medium-sized lali are usual in villages, though I am unable to say whether this is determined by custom or by economics. In these days of cash economy lali are sold as often as they are given in traditional veisā or sōlevu exchanges between clans and/or districts. Since lali prices quoted to me ranged from \$200-\$400 each, depending on size, it would be easy to see why villages might make do with one drum unless custom absolutely required two. [17]. Each lali is supplied complete with a set of appropriate-sized beaters, but lago supports are the purchaser's responsibility.

#### USING THE LALI

A number of traditional beats are 'scored' for two drums, but with the drums usually alternating, rather than playing simultaneously in counterpoint. There may be some overlap on occasion, however. Roth observed that 'two drums are

sometimes beaten at once and though one is always larger than its fellow no attempt is made to arrange the size of the gong so as to provide a harmony. In fact this would be impossible, for the nature of the beats is too staccato to produce that effect.' [18]. (I take it that by 'staccato' he is referring to alternating as against contrapuntal playing). It is true that no range of drums are made in advance for the selection of 'matched pairs.' But it is equally true that part of the conventional wisdom, handed down in such traditional crafts is concerned with the judgement of sizes and proportions, and the large drum is always made first, the smaller drum being made later to 'go with it,' as it was expressed to me. Thus certainly there is not any disharmony between the two drums, the sound in my experience invariably being very attractive to the ear. (It is hard for me to accept as purely coincidental the fact that the two village lali in Korolevu, Namuka, were pitched on the same note, exactly one octave apart).

'It was formerly the regular practice to keep this gong in the men's clubhouse [valenisa]. In some villages it is now kept in one of the unmarried men's houses but more usually it is kept in a conspicuous place, perhaps under a shady tree, near but not too near to the chief's compound or ceremonial house [valelevu]; from there it was, and is, customary for him to issue orders.' [19]. I personally have never known lali to be kept in anyone's house, and though not doubting Roth's observation, and feeling that housing them indoors would protect them from their endemic problem of filling with rainwater, nevertheless thought the idea rather impractical, since their sound would be muffled if beaten indoors, and their size and weight would discourage moving them in and out regularly. Reference to the manuscript and published journals of J.D. Macdonald, who travelled up the Rewa and Waidina Rivers to Namosi in 1856 [20], confirms, however, that they were indeed often kept inside men's houses, and were dragged out to be beaten as occasion demanded. Macdonald, for example, wrote his notes 'seated on a large lali in the Bure ni sa in the town of Tau sa, awaiting the arrival of the chief of Virea [Viria] ...' and later described how at the burénisā at Navunibua in Soloira 'The lalis were hauled out through the low doorways - and the tum tum began to acknowledge the presentation of two whale's teeth a few axes and knives to the chief.' He also made sketches (see Figs 14 & 15) of a large lali housed in the burénisā at Viria. His notes place beyond all doubt the fact that lali were regularly housed indoors and dragged out to be beaten, people closer in time to a stone tool technology perhaps taking far more care of their hardwood artefacts than those of a later era. These days, throughout Lau and Lomaiviti and in other parts of the Group where I have worked, the normal custom is for lali to be situated on one side of the village green (rārā), frequently near the church, provincial administration office or other 'official' building, often, as Roth says, under a shady tree, or exceptionally in purpose-built shelters which have roofs but no walls. In the village of Korolevu, Namuka, the pair of lali sit on their lago under a large vaivainivā-lagi raintree (Albizia lebeck) in front of the main entrance to the Wesleyan church (the only denomination present), between the church and the Tui Namuka's house. An older lali, which Rātū Mosese says was in use in his childhood but which has a broken end baffle and split wall, lies disused on the other side of the tree - I suspect for sentimental reasons.

'Originally the Fijian lali had an import which it has largely lost. It is now a mere relic used for announcing the time of religious services ... But in early days, the lali and its beat were invested with great importance. Old men assure me that it was never beaten without some definite motive or meaning. The beats differed according to their significance, and were easily recognised by those who heard them.' [21]

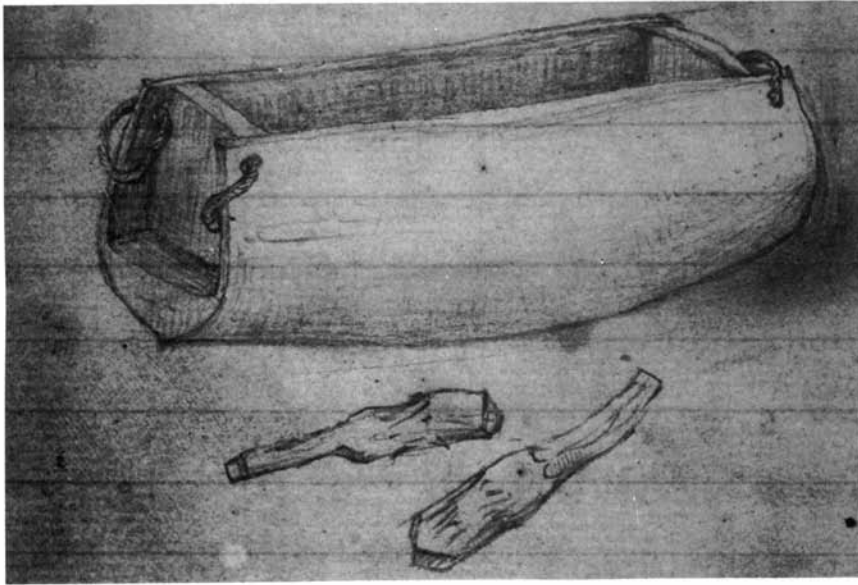


Fig. 14: A large drum J.D. Macdonald of HMS Herald saw and sketched in the stranger's house at Viria, inland on eastern Vitilevu in 1856. Macdonald's notes on this drum read as follows: 'Lali in the Bure ni sa at Viria. 6 feet 6 inches in length.  $2\frac{1}{2}$  feet deep within.  $3\frac{1}{2}$  deep from without &  $3\frac{1}{2}$  in breadth.' Despite its large size, this drum, like other's housed in burenisa, was dragged outdoors and beaten whenever required (see Fig. 15). Courtesy of the National Archives of Fiji.

Even in living memory lali could not be beaten casually, though things are more relaxed today. One afternoon while I was sitting talking to Tui Namuka, I heard some unexpected, quite intricate and attractive rhythms being beaten on the pair of drums in front of the Korolevu church. I asked what the occasion was, but the chief laughed and replied that it was just some 'kids having a go.' I looked out and saw this was indeed the case, the boys involved being in their sub-teens. He commented that in his youth, if he and his contemporaries had larked about on the lali, they would have received a sound cuffing from some of the elders. This relaxation in attitude no doubt in part reflects the new permissiveness in treatment of boys of that age, whose wilfulness seems subjected to only very occasional and then half-hearted control, though their sisters seem to be just as sternly disciplined and hard-worked as ever. Just as significant, however, is the obviously reduced emotional significance and social status of the lali in villages today. Whether the response would have been different had the boys' efforts been merely varegaregataka - random beating - I cannot say. [22]

While the lali has been mentioned by most serious observers of Fijian society, the most common reference in early literature is not to the drum itself, but to the heavy, ominous beat of the derua, which signalled the bringing into



Fig. 15: J.D. Macdonald's sketch of a man beating the lali at Viria in 1856. The carrying loops at the corners of the drum, evident here and in Fig. 14, are not seen on lali today, when drums are no longer regularly moved in and out of doors. Courtesy of National Archives of Fiji.

the village of corpses intended for eating - bokola. The early missionary and peerless writer on Fiji, Thomas Williams, summed up the usual European response to this beat: 'When the bodies of enemies are procured for the oven, the event is published by a peculiar beating of the drum, which alarmed me even before I was informed of its import.' [23]. It is understandable that such a grisly use of the lali should have laid first claim to their attention, and neither Williams nor other early writers commented in much detail on other beats, although their writings hint at a great variety, which both signalled and ornamented many aspects of social custom.



By culling the available sources, it is possible to list some of these uses. It should not be assumed that every application existed everywhere, nor that the beat given for a particular application would be identical in all places. 'It must be taken for granted, however, that in different districts the beats varied when announcing the same thing; and then again the same beat in the same district was liable to be altered slightly by the fancy of the operators. Of these latter, some were adepts, and were well-known for their gift of embellishing the phrases of the beat with grace-notes and accidentals (tataqiriqiri).' [24]. The following list gives some clue to the type and diversity of beats and their significance, but can make no claim to completeness. Numbers 1-6 are still in reasonable currency, 7-16 are obsolete.

1. Simple 'Fijian' beat - one drum, used for various unspecified occasions simply to draw attention, for calling meetings (lali ni bese), and in some places today as a church 'bell' (lali ni lotu). This is the first beat a learner is taught, and the rhythm, using alternate hands for each two strokes, is simply

Ta ta | Ta ta | Ta ta | etc.

2. Simple 'Tongan' beat - more lively than the solemn 'Fijian' one, but of similar function. Its rhythm, with alternate hands used for each stroke, is

Ta ta ta | Ta ta ta | Ta ta ta | etc.

3. The lali ni bese on Namuka is beaten on one drum. Basically it is the 'Fijian' beat described above (1), except that the short note in each bar is reduced to a mere rebound of the beater, and alternate hands being used for successive bars. After ten bars of this, two heavy strokes complete the pattern. If it is a scheduled meeting, such as the women's craft guild (soqosoqo vakamarama), this will be known in advance, either by its regularity of occurrence, or by announcement by the town crier on his round the previous evening. Should no such announcement have been made, it is understood that the chief is calling a general meeting, and all come to the place assigned for this.

4. The lali ni lotu beat that woke me at 6.00 a.m. three days a week in Namuka, calling the faithful to early worship, because two drums are used, is more complex and full of embellishment. However, the basic beat is:

Small lali

Ta | Ta-ta | Ta | Ta-ta |

Large lali

Ta| Ta| Ta| Ta| etc.

5. The lali ni vuli - calling the children to school. This may be the simple 'Fijian' beat (1), but on Namuka it starts with two heavy beats and then becomes more complex.

6. The lali ni mate - signifying that someone has died. This heavy solemn beat of four bars uses one lali:

Ta | Ta | Ta-ta | Ta

After a few seconds' interval this is picked up by a second drum some distance away, then a third, then back to the first. This continues, I understand, for about half an hour. I have not heard this beat played at full strength as it is tabu to do this unless someone has indeed died, which happily did not happen

while I was on Namuka. Even the very quiet demonstration that Qalo beat for me was, however, as dolorous as the 'Last Post.'

This virtually completes the list of extant beats, the one that Deane described as a 'mere relic.' In some places there may also be 'special occasion' beats, such as to announce the arrival of a chief or important visitor. 'It is the practice immediately before a yanggona ceremony is held at the island village of Serua for a gong to be beaten to announce the fact, and thereupon complete silence is expected throughout the village. It is beaten again at the completion of the ceremony, to announce that work in the village may be resumed ... The sound of these gongs carries for twenty or thirty miles according to the prevailing weather conditions and the nature of the surrounding country [This is an extravagant claim - ten miles is a more usual estimate in the literature.] News of the Allied Victory in Europe on 8 May 1945, reached Fiji by radio: in next to no time it was being passed on by the beating of gongs from village to village up the Rewa river and far into the highlands of the interior.' [25]

Obsolete beats that have been documented include the following:

7. The Vakataratara - raising the tabu, four nights after a chief's death. It is called vakotokoto in Kadavu. [26]

8. The lali ni tabua. Beaten on two drums (the first called kaba bū) when receiving a tabua or in time of stress or war. [27]

9. The lali ni waqa - a small drum (lali tuki or kaba niu) was beaten on the great double canoe of a high chief as it got under weigh, and again every twenty minutes or so until the canoe anchored. This warned those on shore to prepare food and the reception for the chief. [28]. Drums beaten on canoes were not always small, however. A painting of a Bauan drua by J. Glen Wilson of HMS Herald in the mid 1850s shows a huge lali being beaten at the forward end of the deck platform (F. Clunie, pers. comm.).

10. The lali ni kabakoro - beaten when besieging a village. This system of 'notifying' the defenders of a village related to the protocol of stylised warfare, where as much attention was paid to 'form' as to inflicting casualties on the defenders. (European adventurers attached to the armies of Fijian protectors did not 'play by the rules,' however, and missed no opportunity to use their firearms to devastating effect, to the gratification of their custom-bound employers. The Tongans likewise were most indelicate in their attitude to Fijian military lore, and their direct and businesslike approach caused mayhem in Fiji). 'In very formal warfare or i valu votu a big wooden lali was beaten to warn the defenders when they were likely to be attacked, the number of beats signifying the number of days until the attack was likely to be launched.' [29]. In this connection an unnamed use of lali, by the besieged rather than the besiegers, has been mentioned: 'Meanwhile, within the fort the war-drum is beating incessantly, now signalling for help to friends at a distance, now rattling a defiance to the enemy ...'. [30]. This use of the lali to impudently challenge the enemy during an engagement had fatal consequences for one courageously foolhardy drummer during the Bā Campaign of 1873. Georgius Wright wrote that 'the Europeans were much surprised at the action of one of the enemy who, having placed a lali in close proximity to a large rock, behind which he hid, persisted in continually rushing from behind the rock and ringing out a challenge on the lali. Repeated attempts were made to shoot him, but at that distance, as soon as he saw the smoke of the rifles, he would rush into cover, coming out again on hearing the thud or ping of the bullet near

him. Strategy was then resorted to, two volunteers lying down together to fire. The fire of the one was delivered, and the other waited until the man came out again, when he immediately fired, and the lali striker disappeared ... with a bullet through the head.' [31]

11. The lali ni bokola, derua, cibi draudrau or tibi. The drum for this beat usually lay behind the ramparts of a fortified village, within the field works of a besieging force, or on board a canoe. It was beaten to proclaim the capture of enemy bodies and the start of the victory dance over them prior to their sacrifice and cooking. The cibi was the men's triumphal dance, to which the women responded with the dele or wate, by all accounts an extraordinarily lascivious affair, in which young women 'compared their own genitals with those of the stripped carcasses of the enemy warriors, praising the sexual prowess of their local heroes, and insulting the naked enemy bodies, jabbing at the sexual organs with sticks ...'. [32]

The simplest form of triumphal beat, the derua of Cakaudrove, Lau and Lomaiviti, is where each hand strikes alternately, three times, each stroke lasting for a full bar, then both hands are brought down heavily together. This beat has also been described with six beats rather than four. The tibi of Tailevu, as complex as the derua was simple, required 'a small, sharp-toned lali to lead, and four or five large booming drums to accompany it.' [33] These beats, while stimulating the victors, were even more importantly meant to demoralise their opponents, there being no doubt as to their fatal meaning. Even after cannibalism was no longer a factor, Christian forces still beat the lali in this way. Brewster recounted an incident during a war between the forces of the then 'King,' Cakobau, and the highlanders of southeastern Vitilevu in the early 1870s: 'One lovely moonlit night the big war drums at Lami, the village at the head of the [Suva] harbour, began to boom forth. We wondered what it portended, as we knew the people there were kinsmen of those in arms against the Government. Presently we saw a flotilla of canoes coming across the bay from which muskets were being discharged and from which we held yells and war whoops. What did it mean? Had King Thakombau been defeated, and was the threatened attack on Suva about to take place? We mustered [the armed Suva settlers] at the little wharf at the mouth of the small creek, the Nambukulau, which was then our landing-place ... But we had no cause for alarm, as those on the canoes came to report a Government victory. The King's levies had encountered a party of the enemy, some of whom had fallen, and consequently the bigheads [highlanders, who wore their hair very long] had burnt their nearest villages and retired further into the interior. Therefore His Majesty had ordered that all the war drums in his dominions should be beaten and salutes fired, that all the world might know that fortune and the first blood was on his side, a portent of the final victory.' [34].

From such extensive use in war, the lali inevitably assumed a significance somewhat akin to battle-standards (which the Fijans also used), and as such were prized as 'spoils of war.' Brewster went on to describe how, when Cakobau's forces were ultimately victorious, their plunder included 'the great big wooden lali or war-drums, several of which are to be found in each village.' Once again the returning victors were 'sounding "the highest points of war"' on their drums. [35]

12. The lali ni burekalou - beaten at the building of a temple in thanks for victory in war. [36]

13. The lali ni sautū - beaten at a peace treaty. [37]

14. The lali vutu - beaten at the birth of a chief. [38]

15. The ta waqa (?). 'A canoe [being built in memory of the dead], while in progress, [is] regularly "awoke" each morning before the carpenters begin their day's work, and "put to sleep" again when they have finished. This is done at each time by a merry beat of drums.'

16. The lali ni leqa, mata or mataveiqali. In the event of sudden danger or matter of urgent import, people were summoned running from their work in the bush or gardens. The matanivanua spokesman, on the chief's instruction, beat the drum, which was located in front of the chief's house, sometimes laid as a threshold. [39]

#### DANCE-DRUMS - LALI NI MEKE

To complete this description of lali it is important not to omit mention of the small ubiquitous 'dance-drums.'

Williams felt that 'the dance is undoubtedly the most popular pastime of Fiji.' [40]. Even today numerous pretexts are found to perform meke, which is what Williams was referring to. These dances are of several forms, and include both male and female types. They are highly stylised, the position of the dancers being dictated by both the form of the dance and their social relationships. Characteristically a meke consists of a dance, a song with a soloist and many-voiced refrain, and a strong rhythm. This last is established by hand-clapping, with long sticks against which shorter ones are beaten, with bamboo 'stamping-tubes,' and/or with small 'drums' called lali ni meke.

Lali ni meke are similar in concept to their larger namesakes, except that their proportions are usually rather long and slim, their 'trough' is not as large in proportion, and they often have no recess in their ends. Some, however, are very fair replicas of large lali. Typically they are from 30 to 60 centimetres long. The sound they emit when struck with their little beaters is sharp and piercing but not resonant. Often made of vesi like the large lali, lali ni meke are not the manufacture of any specific area, but are usually made as needed, by whoever is 'good with his hands.' To accompany meke with them (lalita) they are either placed on the floor in front of, or in the lap of, the player, who is sometimes also the vocal soloist.

#### NOTE ON THE ACOUSTIC PROPERTIES OF LALI

The following information results from some simple acoustic tests on two drums in the Tasmanian Museum and Art Gallery. These are an average-sized lali (TMAG #M4771) and a small lali ni meke (TMAG #M3516). [41]. The sound analysis and oscilloscope pictures were made for me by David Davies of the Physics Department, University of Tasmania. Testing facilities were limited, and in any case my aim was to investigate the rationale behind the form of the drum, rather than achieve a definitive analysis of the complexities of sound emitted by the sample. Accordingly the drums were beaten outdoors, as in normal use, rather than in an acoustically 'dead' laboratory. Recording was done on a good-quality cassette-recorder with an external microphone, and oscilloscope pictures were obtained from these.

I am grateful to the Tasmanian Museum and Art Gallery for entrusting these fine old drums to me for the test, and also to David Davies for kindly analysing the tapes and giving his opinions on them. Any shortcomings in this note should

be attributed to my own imperfect comprehension.

#### Larger drum:

##### Lali measurements:

Length: 1 metre. Height: 41 cm. Width: (centre) 41 cm, (ends) 26 cm. Wall thickness: (centre) 6 cm, (ends) 3 cm. Baffle thickness: (top) 6 cm, (bottom) 17 cm. Extension of walls beyond baffles: 5 cm. Cavity opening: (width) 21.5 cm, (length) 75 cm.

##### Beater measurements:

Large beater. Length: 40 cm. Diameter of head: 7 cm. Diameter of handle: 3 cm.

Small beater. Length: 30 cm. Diameter of head: 3.5 cm. Diameter of handle: 2 cm.

The lali is made of vesi (Intsia bijuga). The beaters are replacements made by me from Tasmanian King Billy Pine (Athrotaxis selaginoides), a very soft wood approximating to Aleurites triloba, which probably would have been used for the originals. To test the effect of altering the size of the beaters, I made one roughly half the diameter of the 'normal' beaters. Short lengths of Bluegum (Eucalyptus globulus) were cut for lago supports. The lali was placed upon the stands where it rested naturally, i.e., where the belly tapered off towards each end. Since the baffles widen downwards into the cavity, the stands were directly under these, but the top of the baffles were somewhat further out.

I followed convention in holding the beaters and where they are struck upon the lali. Beaters are held further up the handle (toward the head) than might be expected. This delivers a more mellow, less 'woody' note. For the same reason the drum is not struck directly atop the lip, but on the angle where the lip recurves and starts to descend inside the drum. The stroke swing is usually fairly long and deliberate, which makes it easier both to maintain a rhythm and to ensure that each stroke has much the same value as the one before, it being momentum rather than muscular effort which controls the force with which the beater hits the drum. The beater is allowed to rebound cleanly so as not to muffle the sound. Sometimes it is allowed to 'bounce' to create a short note, but only in particular beats. Striking the drum in the dead centre of its length produces the longest available wave-length and thus the deepest note. Moving the point of impact toward the baffle progressively shortens the wave-length and raises the pitch, but beating directly at the baffle produces little vibration other than that of wood on wood, and has virtually no musical quality.

#### Dance drum:

##### Lali ni meke measurements:

Length: 44 cm. Height: 11 cm. Width: (centre) 13 cm, (ends) 8 cm. Wall thickness: (centre) 1.8 cm, (ends) 1 cm. Baffle thickness: (top) 4 cm, (bottom) 7 cm. Extension of walls beyond baffles: 4.5 cm. Cavity opening: (width) 8.5 cm, (length) 27 cm.

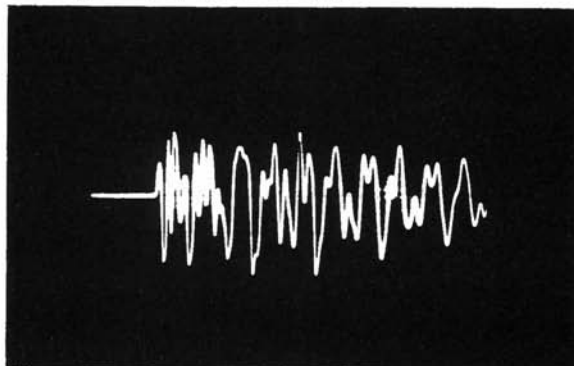
##### Beater measurements:

Length: 14.5 cm. Diameter throughout length: 1.8 cm.

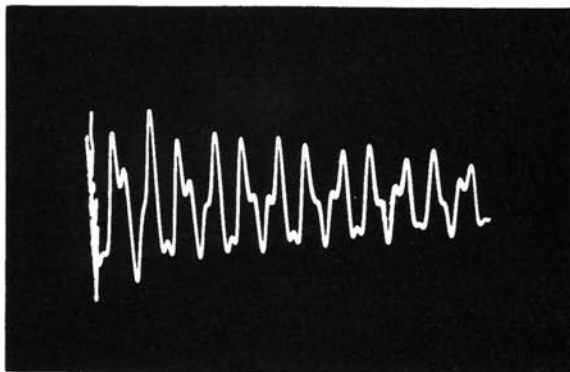
#### THE TESTS

##### A. Large drum

##### (1) Large beater, centre of drum



Initial impact and decay



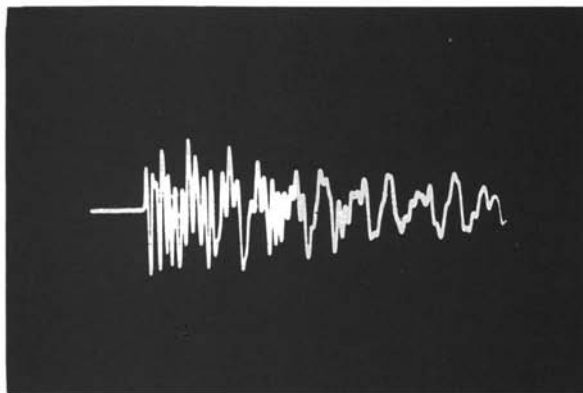
Decaying note - amplitude magnified

Time base: 5 milliseconds/cm.

The initial high-frequency spikes are the sound of wood on wood as the beater hits the drum. After this initial aberration (about 8 milliseconds), although the wave form is complex it repeats fairly consistently. There is a phase change each period. The amplitude (perceived as loudness) decays quite rapidly (to about half in the space of some 25 milliseconds). Fundamental frequency is approximately 333 Hz - the note E4 (E above Middle C).

##### (2) Small beater, centre of drum



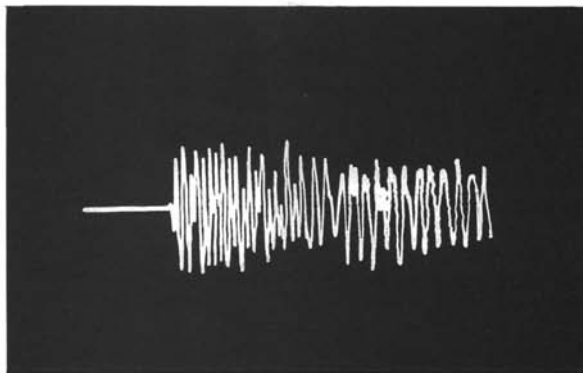


Initial impact and decay

Time base: 5 milliseconds/cm.

The picture is similar to that obtained with the larger beater, except that the harmonics are different and thus there is an alteration in tone. Amplitude is less and decay slightly faster (to half in about 20 milliseconds). The note is thus not as loud and dies away more rapidly. Fundamental frequency remains approximately 333 Hz as before. Due to the difference in harmonics, however, the note is perceived as higher with the small beater.

(3) Large beater, near baffle



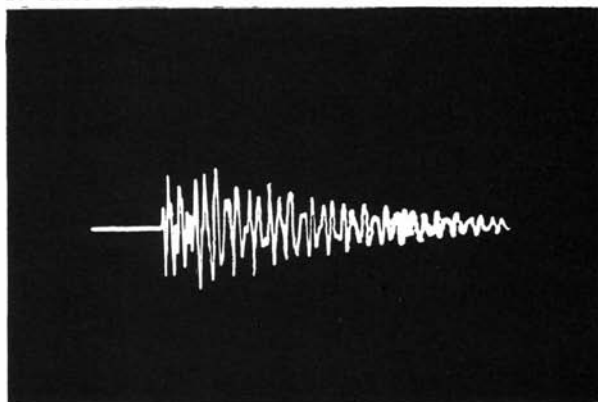
Initial impact and decay

Time base: 5 milliseconds/cm.

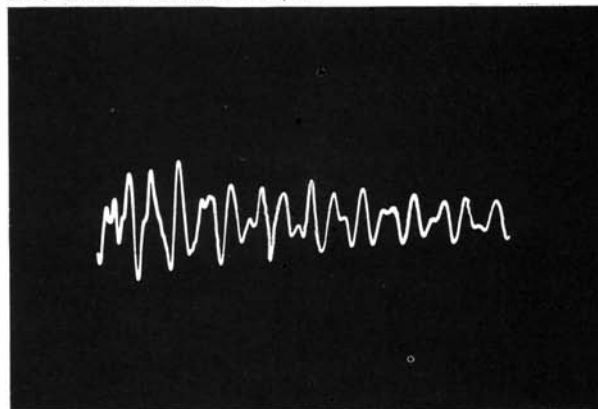
The aberrant period due to the sound of wood on wood persists somewhat longer. The subsequent wave form is slightly less complex, amplitude less, and decay less rapid than when striking the drum in the centre. Frequency is much higher - approximately 1000 Hz - the note B5 (B in the octave above Middle C, or four

full notes higher than the note caused by striking in the centre).

B. Dance drum



Time base: 5 milliseconds/cm.



Time base: 2 milliseconds/cm.

The essential characteristics of this miniature drum are surprisingly consistent with those of the large version. Initial aberration due to wood on wood lasts only about 4 milliseconds. Initial amplitude is similar to that of the large drum, but decay is more rapid - about half in 15 milliseconds. Thus the sound is much more staccato than that of the larger drum struck with a large beater. Fundamental frequency is high - approximately 1250 Hz - the note Eb6 - almost exactly two octaves higher than the fundamental of the larger drum.

ACKNOWLEDGEMENTS

Field-work for this paper was done incidentally to a research project funded by the Australian Research Grants Commission, Department of Education & Science,

and by the University of Tasmania. I am extremely grateful to both bodies. In Fiji I have always received unstinting support from Fergus Clunie, Director of the Fiji Museum, and other staff members of the Museum. I must also thank Dr Isireli Lasaqa, former Secretary to Cabinet, and Rātū Meli Bainimarama of the Ministry of Fijian Affairs, both of whom helped me in various ways. The people of Namuka were uniformly friendly and helpful during my stay there. My thanks to Easi Qalo for showing me his craft and for freely answering all my questions. Above all I am grateful to the Tui Namuka, Rātū Mosese Fotuwaika, and his family. They spared no effort to make my stay enjoyable and productive and fully succeeded. Vinaka sara vaka levu, kemuni. Loloma bibi maivei nomuni itau. Rote.

## NOTES

1. Roth, G.K. 1953. The Fijian way of life. Oxford University Press. p.30.
2. Ewins, R. 1982. Fijian artefacts. Hobart, Tasmanian Museum & Art Gallery. p.58, fig. 94. These troughs are used throughout Lau and neighbouring islands as a general-purpose vessel, and in them is pounded the much-relished vakalolo pudding of starch and sugar. In Cakaudrove these vessels are called ta'ona, in Lomaiviti, takona.
3. Oneata, while a limestone island like the others, and possessing vesi, has no clan of Tonga/Samoa woodcraftsmen, and thus no corresponding yau. Its principal male yau is the sinnet waist belt or ioro magimagi with which it has long supplied the chiefs of Lakeba.
4. It is interesting to note that, since the koromakawa was abandoned 'before the lotu [Christianity]', the new settlers are making use of the old house-mounds (yavu) since they no longer hold any family significance.
5. Deane, W. 1921. Fijian society. London, MacMillan. p.198.
6. Ibid.
7. Clunie, F. 1977. Fijian weapons and warfare. Suva, Fiji Museum. p.59.
8. Roth, op. cit.
9. See pages 163-167 of this article for a Note on the acoustic properties of lali.
10. Ibid.
11. Williams, T. 1858. Fiji and the Fijians: the islands and their inhabitants. Suva, Fiji Museum, 1982 reprint of original edition. Illustration, p. 164.
12. The vuro also had symbolic significance. If a hero had slain ten men in battle, he would be given one vuro armband to wear on his upper arm - it was known as his first tora (Deane, op.cit., p.74).
13. Roth, op. cit.
14. Wilkes, C. 1845. Narrative of the United States Exploring Expedition during the years 1838-1842. Vol. 3. Philadelphia, Lea and Blanchard. The marked difference in size between the two drumsticks, clearly apparent in the engraving (p. 316) was evidently real. Wilkes (p. 300) stated emphatically that lali emitted 'a deep hollow tone when struck with the small and large stick, with which they produce the different sounds.'
15. Elsewhere in Fiji, the sikeci is often called lauci.
16. Gordon, A.H.G. 1879. Letters and notes written during the disturbances in the highlands (known as the 'Devil Country' of Viti Levu, Fiji). 2 vols. Edinburgh. R. & R. Clark. (Quoted in Roth, op. cit., p. 30).
17. These prices may be better assessed by comparison with the average annual cash income of the average nuclear family in Lau, which was suggested to me on different islands as ranging from about \$700 to a relatively prosperous \$1500.
18. Roth, op. cit.

19. Ibid.
20. Macdonald, J.D. 1856. Journal of the exploration of the Rewa River and River and its tributaries. Manuscript in the National Archives, Suva. See also his Proceedings of the Expedition for the exploration of the Rewa River and its tributaries, in Na Viti Levu, Fiji Islands. Journal of the Royal Geographical Society, 1858, Vol. 27, pages 232-268.
21. Deane, op. cit., p. 198.
22. Cf., vagedegedetaka - to beat the lali wrongly, but not randomly.
23. Williams, op. cit., p. 207.
24. Deane, op. cit., p. 198-9.
25. Roth, op. cit.
26. Deane, op. cit.
27. Ibid.
28. Hocart, A.M. 1952. The northern states of Fiji. London, Royal Anthropological Institute of Great Britain and Ireland. p. 105, translation from Na Mata, 1910, p. 188.
29. Clunie, op. cit., p. 25.
30. Thomson, B. 1908. The Fijians: a study of the decay of custom. London, Heinemann, p. 93.
31. Wright, G. 1916. Fiji in the early seventies. Transactions of the Fijian Society (Quoted in Clunie, op. cit., p. 98).
32. Clunie, op. cit., p. 36, including quote from Jackson's narrative in Erskine, J.E., 1853. Journal of a cruise among the islands of the Western Pacific. London, Murray. p. 438.
33. Deane, op. cit., p. 203; and Hocart, op. cit., p. 106.
34. Brewster, A.B. 1922. The hill-tribes of Fiji. Philadelphia, Lippincott. p. 62.
35. Ibid, p. 63.
36. Capell, A. 1973. A new Fijian dictionary. Suva, Government Printer. 'Lali.'
37. Deane, op. cit.
38. Capell, op. cit.
39. Hocart, op. cit.
40. Williams, op. cit., p. 164.
41. Ewins, op. cit., p. 67.

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# POSTSCRIPT

## *LALI* - THE DRUMS OF FIJI

The following contains important analytical notes that were to my regret edited out of the article published in *Domodomo:Fiji Museum Quarterly* (v.4 no.4, 1986. p.142-169). In their preparation, as for the oscilloscope photos that *were* included in the article, I wish to acknowledge the collaboration of my colleague David Davies, Department of Physics, University of Tasmania, an accomplished musician as well as a physicist. He provided valuable discussion and advice to me during this analysis, but bears no responsibility for any shortcomings. I also discussed them with another colleague, Professor Simone de Haan (then Head of the Tasmanian Conservatorium of Music). Similarly, he bears no responsibility for any lingering errors on my part.

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**Pitch, tone, and carrying power :** The sound generated by striking a *lali* is extremely complex, but the presence of a fundamental frequency does mean that it does produce a musical note. In terms of European drums it may be suggested as falling somewhere between the tuned kettle drum and the untuned rhythm drum (the latter producing a more random collection of wave-forms). The fundamental frequency of vibration of the particular drum which was tested delivers a note in the mid-range, which would not have exceptional carrying power. This is consistent with its average size and almost certain function merely as a village 'meeting' drum. Certainly this drum would be more than adequate for its purpose, and would be heard clearly throughout a village and the neighbouring garden and work areas, all of which would typically fall within a radius of a mile. (These tests were conducted at my home in the country, and set all the dogs barking for what seemed like miles around!) The giant war-drums of old Fiji, some of them three times this size or more, in view of the greater length between the nodes of their baffles, thicker walls, and greater volume of material altogether, would have delivered a far deeper note. Since low frequency waves are, unlike high frequency waves, capable of travelling around

obstacles, the carrying power attributed to these old drums is quite credible. The *lali ni meke* , with its relatively high pitch, has little carrying power but it does not need it. Its function is solely the rhythm accompaniment of dances, and it is perfectly adequate for this purpose.

In manufacturing, the **wall-thickness** will affect both the fundamental and the harmonics; that is to say, both the actual pitch and the tone. In essence, the thicker the timber the deeper the note, but (particularly on small or average-sized drums) thinner walls may deliver a somewhat 'brighter' and less muffled note.

The **cavity** has a relatively large mouth, so it does not really function as a resonating chamber. Rather, it facilitates a connection of the excited air all around the vibrating walls of the drum, thus maximising the sound transmission. If the mouth were more closed, although the internal resonance would favour the lower harmonics, and alter the tone of the drum, its carrying power would probably be diminished rather than enhanced.

The **baffles** serve not so much to close the cavity, as to provide a physical connection between all parts of the drum. As just indicated, the note delivered by the drum is a function of wall vibration rather than of a resonating chamber. The baffles, providing physical continuity (even to the level of continuous xylem structure) between all parts of the opened 'cylinder', permit very rapid transmission of the waves through all parts of the drum when it is struck. Also, since they create nodes, the distance between them affects the wave-length and thus the pitch of the drum - the greater the distance between the baffles, the deeper the note or fundamental frequency of the drum. Thus during manufacture some 'tuning', say from a sharp to a natural note, may be achievable by paring off the baffle. The operative effect is on the substance of the drum rather than on the size of the internal cavity. The closer to the node that vibration is initiated, the shorter



the wave-length and higher the pitch - as shown in the test, striking near the baffle shortened the wavelength of the vibration so that the drum resonated at B5 , whereas striking at the centre caused it to resonate four notes lower, at E4 . With larger drums the difference could be greater.

From the points raised above, it can be seen that the *lali* is not really functioning as a drum or as a gong, which are the common terms applied to it. Typically in drums a partly or wholly enclosed airspace is covered with a thin tympan of metal, hide, or fabric. When this is struck it is the vibration of the enclosed air that generates the sound. Gongs typically are flat plates, and while it is the actual material of the gong that generates the sound, as with the *lali*, the acoustics of flat plates are different from those in play here. The *lali* is in fact functioning as a wooden bell, with an open-mouthed cavity which serves to maximise the audible affect of the vibrations of its complex form. As with other bells, the acoustics too are extraordinarily complex to analyse with precision, and manufacture still at this time relies on the maker's experience and judgement rather than scientifically definable data. Since it is the vibration of the whole object that produces the sound, virtually every variable of dimension will have some effect. Any one of these things may be modified without much noticeable effect, but the sum of them all is that which imparts to each instrument its own properties, and it is in knowing how to repeatedly and repeatably achieve a functional and pleasing result, that the skill of the maker lies.

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