Leaf boomerangs

by Luc Bordes

From the Australian Aboriginal boomerangs(1) to the modern boomerangs thrown today all over the world, these objects went through numerous variations of shape, technologies and sophistication, being made nowadays with modern materials dedicated to performance and leisure time.

But if we go backtrack, towards traditionnal boomerangs and more primitive examples, we will first find raw wood traditionnal Aboriginal boomerangs evolved from the more ancient throwing sticks(2), but we will find also some toys adapted to be used by young people, made of lighter wood, bark or from simple folded leaves.
Indeed, in the region of Queensland, adult and young Aboriginal people, who mastered the art of throwing ,used to modify accacia leaves and make them fly along curved trajectories, with sometimes completely returning flights[1].
Simple bark strips curved with fire heat could be used for this sort of game.

In the Queensland region, Aboriginal people used in particular a famous and strange cross shaped and lashed wood boomerang, imitating bamboo models probably imported from indonesia at least few hundred of years ago[2].

Similar to this model, and even more fascinating was a leaf boomerang made from pandanus palm tree (*pandanus pedunculatus*) made and thrown by young people on dunk islands(Queensland)[1]. It was called«par-gir-ah» or «birra birra goo» or again «little fella boomerang» in Aboriginal english. Two uses as a toy were possible : Thrown in the air or fixed at the end of a stick to build a small helice turned by hand

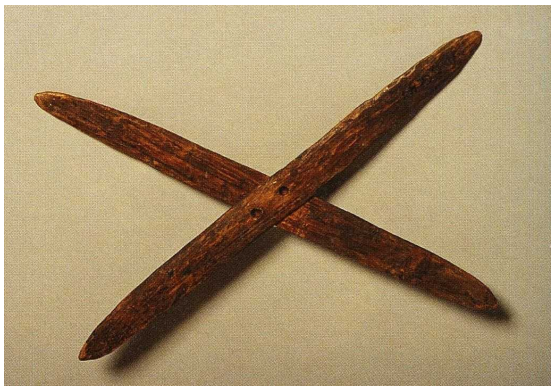


Fig 1: Cross shaped wood boomerang from Queensland,
without lashing, similar to the bambou model found in Indonesia.

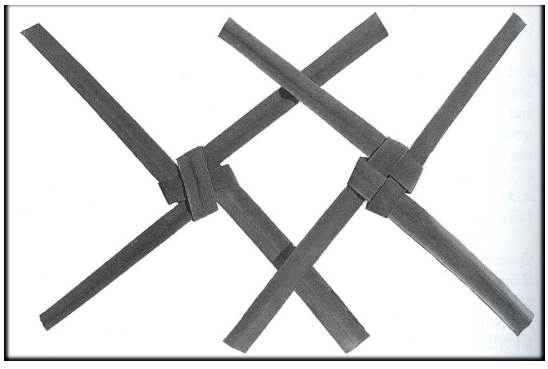


Fig 2: Two toy leaf boomerangs made of pandanus leaves used in Queensland

Fig 3: Toy boomerang made of pandanus leaves «pa gi rah», among the collection of South Australian museum, Adelaide. Observe the beveled blade ends.

Another model of palm leaf boomerang made on dunk island, even simplier is named piar-piar.
It is made of one single leaf, lashed two times, to form a flatened Z shape with its ends being round trimed and being slightly tuned in incidence to get a returning flight.

Fig 4: Example of palm leaf boomerang «piar piar» in Z shape

This second example of leaf boomerang is even simplier than the cross leaf booomerang par-gir ah and keep an particular symetry which set it as a four bladed like boomerang. Indeed the jonction of the two lashing form a length which could be seen as two little perpendicular blades relative to the two other ending blades.
This shape containing two axes, stabilizing the rotative plane in flight.

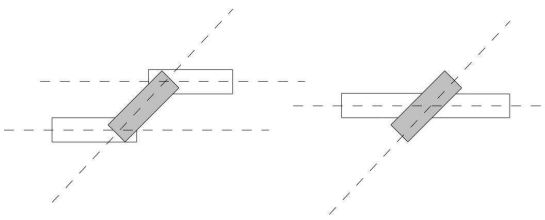


Fig 5: Equivalence between a Piar piar shape with a four bladed shape. The two leaf extremities form two blades along one axe and the jonction length fomed by two lashing form two other little shorter blades with a 45 ° angle, showing that this Z form is well equivalent to a four bladed boomerang.

The first time I saw one of these objects was during my visit of South australian Museum in Perth in 2010. I stopped in contemplation in front of its stunning elegant simplicity.
Behind the windows two bit of grass interlaced were forming four blades of a little boomerang. The simplier boomerang of the world !
I kept carefully these marvellous boomerangs in a corner of my mind(and are still there !), and returned in France, I decided to built few of them to test for fun and curosity. I didn't resist to share my experience with you.

Making a par-gir-ah ou birra birra goo:

As Pandanus palm tree or vacoa is not common around Paris, I decided to use flat yucca leaves for this purpose.

Indeed, yucca grow in the forest near my home, probably yucca planted in private gardens, escaped from the civilization and being on the way to go back into the wild. I 'm sure many other plants with wide and flat leaf could be used. Be free to experiment !

To start, I select a leaf in a good state with approximatively two centimeters widness, as flat as possible. I split it easily by hand in two equal halves(6A). I use the central flat part of the leaf to do the folding, doing it a first time like (6B) and a second time to form a «Z» like (6C)
I start again with the other leaf part the same way, taking care to fold them in the same way(6D).

I interlock the two «Z» shapes inside each other. If all is correct, I just have to put one extremity of one of the leaf under the other to weave(6E) them and block the ligature by pulling gently(6F). I pull gently also the opposite extremities of each half leaf to finish the thightening of the central ligature.

Next, I cut each boomerang leaf blade at the right length, approximativly ten centimeters. It here that appear the only little tool needed for this crafting(but could be possible with your teeth if they are enough sharpened), as a little cutting flint flake used to cut clean the leaves blades extremities(6G).

The crafting of the boomerang is already finished after few minutes but it couldn't fly like that !

Indeed, the green leaves of the yucca are too souple and heavy to turn quicly and effectively around the center of gravity, although it is this same property which allow to weave them in a boomerang.
The true secret of this boomerang live in the patience to wait for these leaves to dry up, laying flat, and the nature will do the final part.

After the drying, the two tied leaves will become lighter by deshydratation and gain in rigidity. They will become a boomerang. To help this, a weight of any kind on a table or two flat stones for the primitive way will do the job.

In fonction of my experience, in a dry house environnement with a temperature around 20 °C, I needed two weeks of drying but its likely that drying them outside, on a hot dry summer day with a little breeze, would take only fews days.

A B

C D

E F

G H

Fig 6A to 6H. Steps of primitive crafting of a quadripale leaf toy boomerang.

Frequently during the drying, the edges of the yucca leaves tend to curve toward the center, so you will need to finish by flatten them with hand before throwing.

Because of this twisting tendency of the leaves, it is better to keep the same side of the leaf facing the same side(extrados or intrados)(3) of the boomerang to create with the slightly concave leaves surface a kind of natural airfoil !
The leaf boomerangs made this way, seems to me to work better, but just try yourself.

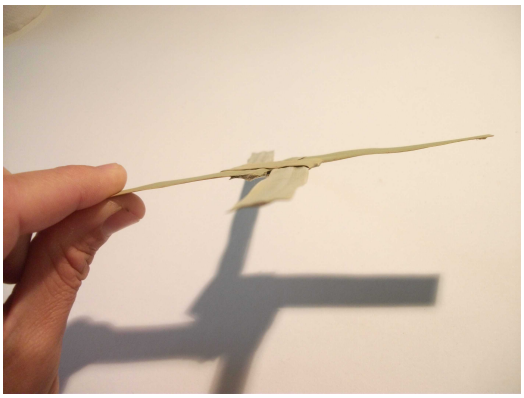


Fig 7: Par-gir-ah made of a yucca leaf after drying. By pinching one of the extremity you can test the acquired rigidity and check your drying.

Apparently, the pandanus leaves used by Australian Aboriginal people were gathered drier, and didn't need to dry as much because they were making these boomerang right away, but I guess it could be less easy to tied already too dry leaves.

I suppose the method should consist to select them a bit already dry but with no risk to break them during the weaving.
As we know selecting the starting material is critical for all primitives techniques and always bringing already 50% of a good result !

Crafting a Piar Piar

Instead of tying two half leaves to obtain a cross boomerang it possible to tie two times a single half leaf to form a this kind of Z shaped boomerang.
I start to fold the half leaf to form a loop(8A) and passing through it one of the extremity(8B) and restart the operation to form a second loop to get the symetry relative to the center of the Z shape(8C,8D,8E).

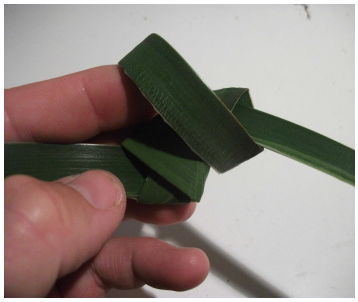
Then i cut the leaf blade to five centimeters lenght and trim the extremities round. I let them dry the same way under a weight to get a lighter and a more rigid Piar Piar boomerang(8G,8H).

A

B

C

D



E

F

G

Fig 8A à 8G: Steps to craft toy leaf boomerangs in a Z shape named «Piar piar»

The throwing:

The throwing of these both sort of boomerangs is done the same way as light cardboard boomerangs: Pinched between the thumb and the forefinger, they are thrown vertically in a quick movement of the wrist, without putting in any arm strength, with a maximum of rotation. They range could reach three meters and adapt themselves very good to throw boomerang inside your house, around a fire with friends, to have fun.
It is know Australian Aboriginal people use the hot air of their fire to make contest and to make climb on the warmth air current their leaf boomerang as high as possible.
Their flight are gracious and they seem to be leaves transformed by magic in small helicopter helices, without the annoying metal and sound pollution.

It's possible to tune easily these boomerangs using sligtly the incidence blades twisting as for cardboard boomerangs.
Don't hesitate between throws to flaten them and tune them again if they start to fly badly. You could try also to shorten a bit the blades if you observe too much rotation breaking.
They are enough solid for a throwing session but are naturally short lived and fragile, which do all their beauty.

In conclusion

By Saying that these toy leaf boomerangs would have leaded to the direct discovery of the boomerang would be a too quick shortcut and would let aside all the evoluting technology and workmanship brought by the ancient throwing sticks, the prehistoric weapons and tools which slowly perfectionate themselves and specialized finally in these gaming objects . But These toy leaf boomerangs probably contributed early, by imitating wood heavier boomerangs and throwing sticks, to the mastering of the boomerang technology and helping Its transmission between old and young generations and also diffusion between different groups of native Australian people.

Through its simplicity, this ephemere boomerang show all the

Australian aboriginal people cleverness to use weaving aiming to create surprising objects, useful to gather, conserve but also to play and dream. Another basic need for people to get !

I hope these boomerangs will illuminate one of your primitive day or night by their fresh simplicity, like your first time fire friction making, and could continue to weave more deeply your connection with nature.

Notes:

1 Throwing stick and boomerang terminology:

This term is general here and is applied to a tool made of one or several wood pieces, or less often others natural material which are set with a angle between 0 to 180 degres.
These wood piece are called wing, more or less shaped and this object is thrown in rotation in the air in a rotating plane.
Boomerangs are only a particular sub category and very specialized throwing sticks with returning trajectory.

2 Incidence

The incidence is defined by the angle between the table plane and the medium axe passing in the middle of the throwing stick airfoil taken in the blade moving direction.

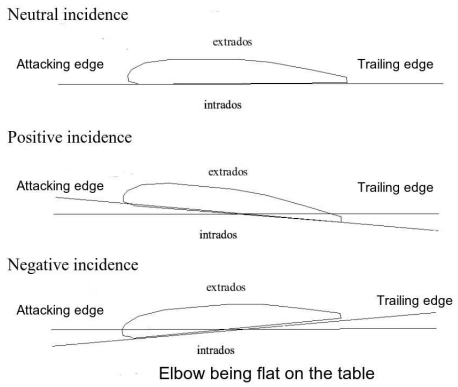


Fig 9: Positive, negative or neutral incidence

3 Extrados/Intrados

The face of a throwing stick or boomerang that is directed toward the ground or the ouside of trajectory during the flight is called intrados or lower face.
The other face, the upper face, that could be seen by the thrower is called extrados or upper face. The extrados is more often decorated.

Bibliography:

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2 Throwing Bird hunting sticks and cross bamboo boomerangs from the Celebes, primitive technology bulletin, Luc Bordes N°37 spring 2009