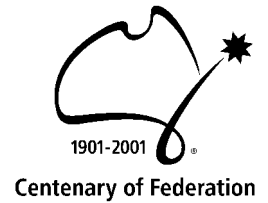


Questacon

Food from Thought



Aboriginal technology takes some effort out of hunting.

WHAT'S THE PROBLEM?

Thousands of years before Australian Federation, the indigenous people of this land were collecting food and hunting to survive. Aboriginal Australians have invented a number of labour-saving technologies that make hunting easier. These devices make sure the energy gained from eating food is greater than the energy used in hunting for it.

GREAT SOLUTIONS

Credited with inventing the boomerang, many Aboriginal groups used this tool mainly for hunting but also in religious ceremonies. The weapon can easily kill a small animal or knock down a larger one.

Hunters all over the world have used spears and Aboriginal Australians invented the 'woomera' to improve their spear throwing.



The returning boomerang (top) and the non-returning (killing) boomerang (bottom).



The woomera (bottom) allows the spear (top) to be thrown further.

HOW DO THEY WORK?

A boomerang must be held vertically and thrown with spin. They can travel distances up to 200m. Boomerangs used for hunting are heavy sticks with a slight curve, which means they can be aimed and thrown in a straight line at high speed. These are termed non-returning boomerangs. The spinning motion of the boomerang gives it stability as it flies. The more familiar returning boomerang is light in weight and has a more curved shape, which causes it to fly back to the thrower.

The way that boomerangs work is very complex. Part of the explanation is that boomerangs are flatter on the lower side and more curved on top in a shape called an aerofoil. When a boomerang is in flight, air travels faster across the top than the bottom of each wing. Fast moving air is at a lower pressure than slow moving air and the difference in air pressure lifts the boomerang.

Why do bent boomerangs come back? When a curved boomerang spins in flight, the two wings experience different amounts of lift. One wing always enters undisturbed air, while the other wing is faced with air that has been churned up by the first wing, causing less lift. Also, as the boomerang spins, one wing moves in the direction of the boomerang's flight and has more lift than the other wing which is spinning back. The boomerang tends to flip over but the spinning motion changes this flipping over action into the curved path of the returning boomerang.

A woomera is a simple lever that acts to increase the speed at which a spear is thrown, and thus increase the distance it travels. Made of wood, a woomera acts as an extension of the thrower's arm.

FURTHER INFO, FACTS & FUN

- Now an international sport, throwing a returning boomerang might be fun, but don't expect it to keep you fed! The curved trajectory makes the returning boomerang difficult to aim and they are typically too light in weight to knock down anything bigger than a mouse!
- Throwing sticks like boomerangs have been around for more than 15 000 years and were invented independently by a number of different cultures. People in Egypt, Africa, Europe and North America used throwing sticks but the returning boomerang is unique to the Australian Aborigines.
- In 1914, inventor David Unaipon used the principles of boomerang flight to anticipate the helicopter. A Ngarrindjeri man, Unaipon was fascinated by the idea of perpetual motion and invented such things as an improved handpiece for sheepshearing, a centrifugal motor and a multi-radial wheel.



Inventor David Unaipon (1872 – 1967) of the Ngarrindjeri people was the first Aboriginal writer to be published.

(Image provided by the Reserve Bank of Australia)

- For more info on how boomerangs work, check out: <http://www.howstuffworks.com/boomerang.htm>

For more info on great Australian Science check out:

Questacon's Innovative Australians <http://www.questacon.edu.au/innovaus>

CSIRO's Australia Advances <http://www.csiro.au/promos/ozadvances>

The Australian Academy of Science's Nova <http://www.science.org.au/nova>

The Australian Science Archive Project <http://www.asap.unimelb.edu.au/>