

Fishing Methods and Implements of Ancient Chile

600 BC - AD 1400

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Fishing in Northern Chile 5050BC-200BC & Description of Fishing Implements

Fishing is the oldest enduring method of subsistence in the Andes. Prior to the introduction of agriculture, the Chilean and Peruvian people depended primarily on the sea for food (Bennet and Bird, 1960, p. 26). On the extreme North Coast of Chile, archaeologist Junius Bird found evidence of early fishing cultures, dating to 6000 BC, near the settlements of Arica, Pisagua and Taltal. Bird's excavations uncovered a large variety of fishing implements to include fish

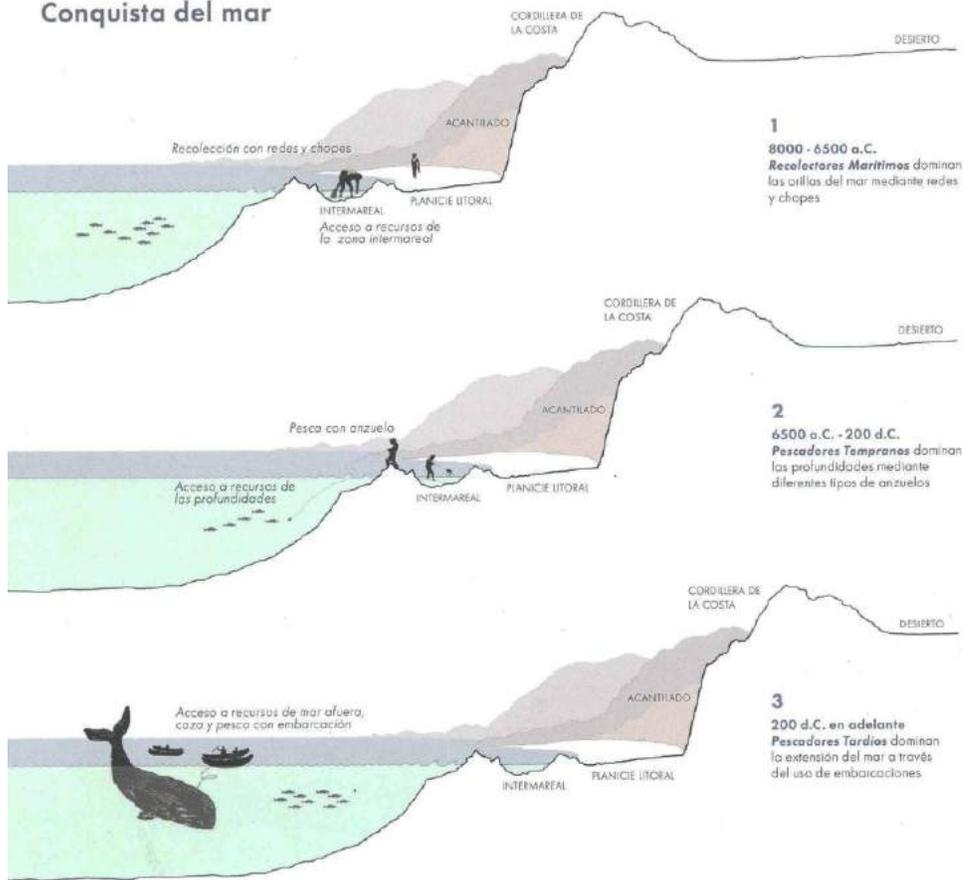


hooks of different shapes and materials, fishing line of bast or cotton, stone sinkers, harpoons and tools for fashioning them. For 10,000 years, from the archaic to the Colonial periods, the technology remained fairly constant, making dating based on style difficult but not impossible. The fisherman of Chile used ingenious methods to perfect capturing the rich marine life.

The Terrain

The special climatic conditions of the Pacific Coast of South America are responsible for the most abundant marine life in the world. The arid, windy climate off of the coast of Chile and Peru, combined with the cold waters of the Humboldt current and the powerful crosscurrent of the cyclical El Nino carries in a wealth of nourishing algae and phytoplankton from deep in the ocean. These microorganisms in turn attract a constant supply of edible fish, such as anchovies, sardines, and a wide assortment of larger fish, seals, sea lions, and birds such as gulls, pelicans, sandpipers, and cormorants. The powerful cross currents of El Nino periodically disrupt the entire ecosystem and create cataclysmic destruction along the Pacific coast. Peruvian folklore states that El Nino visits only once every seven years around Christmas time, for which it is named.

Conquista del mar



1
8000 - 6500 a.C.
Recolectores Marítimos dominan las orillas del mar mediante redes y chopos

2
6500 a.C. - 200 d.C.
Pescadores Tempranos dominan las profundidades mediante diferentes tipos de anzuelos

3
200 d.C. en adelante
Pescadores Tardíos dominan la extensión del mar a través del uso de embarcaciones

Tres etapas en la conquista económica del mar.
(dibujo de F. Maldonado sobre una idea de J. Berenguer basada en Ilagostera, 1982).

An intriguing feature of these fishing areas was their semi-permanence. The length of time for which a civilized culture would take root was directly proportional to the availability of a combination of ocean water and freshwater all in one coastal zone. This combination allowed for a greater diversity of food sources.

Coastal settlements along the Pacific were mostly located close to freshwater springs or other freshwater sources such as streams or rivers from the runoff of the Andes that were close to the ocean. These sites were occupied for very long periods of time (Berenguer, Jose, 2008, p.95).

At these sites, archaeologists

have discovered middens large archeological mounds that contain the remains of human occupation, such as the remains of shellfish, sea animals, and on occasion all sorts of fishing tools. These middens reveal a deeper understanding of the fishing civilizations that existed thousands of years ago.



Pre-Historic Fishing Techniques

The earliest technique in human history for catching fish on record is diving. Diving was employed extensively by the inhabitants of the Chilean, Ecuadorian and Peruvian coasts. Long before fishing was invented, humans in Pre-Colombian times would dive in the intertidal zone of the ocean to capture fish. Over the course of time, as divers learned new breathing techniques, adapted to the rigors of changes in pressure, and invented improved diving implements such as spears and harpoons, divers were able to dive to over 200 feet deep.

Another early form of fishing consisted of collecting clams and shellfish from the rocky shores of the Pacific. Over time, fishing methods became more advanced, and forms of tackle were diversified (Moseley, 2001, p.99). By examining the archaeological record of burial sites, a picture of ancient fisherman has emerged. Waste burial sites, or middens, in the area reveal abundant remains of bone fishhooks, net fragments, mollusk shells, sea bird remains, and the bones of anchovies, sardines and marine mammals. As time progressed, different burial sights revealed slightly different styles of their fishing tools, such as in fish hooks differing in materials and shape.

The Evolution of Fishing Technology

Early excavations by Junius Bird on the north coast of Chile in 1946 found two distinct periods of occupation along the coast: an initial period of shell hook fishing, followed by a period of thorn hook fishing, referred to as the “Cactus Thorn Fishhook Culture.” Initially fish were speared, or shot with bow & arrow in fresh waters near the coast. With the cultivation of cotton, people learned knotting techniques to fashion the cotton thread into nets and bags for fishing (Disselhoff, 1967, p32). Various types of hand and casting nets were also operated from cliffs above the shore line. Later in the development of fishing technology, people built small reed boats, *Caballitos de Totorá*, which were paddled out to sea in search of schools of fish.. . (Disselhoff, 1967, p.32).

The first known fish hooks were made from clamshells. The fisherman devised a simple and ingenious way to create hooks from shells. They would drill a dime-sized hole in the center of a shell, and then carve a fish hook using the remaining circular shape of the shell.



Later, hooks were made from cactus thorns. The thorns were curved by the application of heat at one end. The fisherman also created a notched shank at the other end of the cactus hooks for attaching the line. The invention of fishing hooks was quickly advanced by the creation of floats and sinkers. Later in time came the invention of copper hooks, made from the ample supply of copper ore on the coast.

Harpoons made from wood shafts with attached stone flaked arrow heads or ovoid points. Bone and thorn harpoons, followed by larger wood harpoons with stone points were used to hunt fish of varying sizes as well as small seals and larger sea lions. The seals and sea lions were valued for their skins, fat, organ meat, and bones.

Sea lion ribs were used as pry bars to extract the muscle from mollusks found on the rocky shores. (Moseley, 2001, p.100). Also discovered were spear throwers, darts, wooden spears, clubs with stone heads, axes, and slings which date back as far as 10,000 years. *Bolas*, or sling shots, probably acquired from contacts from the plains tribes of Argentina and Uruguay, occasionally were used to hunt marine birds, seals, and sea lions.

Individual fishermen were often buried with their fishing instruments. One such special form of fishing implement found at these sites was harpoons forepieces with bone shafts and thorn barbs that were connected to a long wooden pole. The pole would have been used to drive the harpoon into larger marine life, such as sea lion pups and larger animals. This also implies the potential use of rafts built from wood and inflated sea lion skins so as to venture farther out to sea. These rafts would have been used for group fishing and sea lion hunting expeditions and even small whales.

Unearthing Fishing Implements at Burial Sites



Sometimes found at these burial sites were series of implements in various stages of completion. It is believed that each fisherman specialized in a technique for the fabrication of one type of implement, such as hooks made from shell, or those of thorns, and even bone and copper. The fisherman devised clever tools to make their implements in series. At one site, a small carved bone was found that had parallel lines drawn on it which acted as a spacing guide to cut bone barbs.

Other ingenious instruments have been found at these sites, including a sharpening cube of rock crystal that was found with a group of copper fish hooks, and a sea lion rib with hemp wrapped around the end that was used to pry open clams by hand, and other bivalves.



The hemp allowed the fisherman to use greater force to work open the shell fish. One unusual knife blade was found in a wood case, open on one side, which probably kept the blade from tearing a hole in a bag. A dense bone shaped as a hand tool was used to burnish bones or hooks.

Arrows discovered at these sites had small knapped arrow heads of stone which were fitted into a drilled hole at the end of the shaft. These worked stone points were



wrapped with tightly spun wool or cotton string, and then glued to a wooden shaft with a dark tree resin material. -Some arrows had fletching, strips of feathers at the ends to guide the arrow on a straight path. A cylindrical bone container was found, filled with sting ray stingers, which were presumably to cut the fleshy fish. Bow string drills utilized a cleverly designed drill chuck devised of two pieces of beveled wood strapped together by animal gut. At one end of the split chuck was a center groove that tightened around a copper needle shaped drill bit. The chuck was cut on a tapered angle which allowed for a longer wood spindle shaft that was also tapered cut to mate with the chuck.



Harpoons, Hooks, and Sinkers

As copper fish hooks developed, they were crafted in a variety of shapes and sizes. Few had looped ends to tie the cotton line through, while the majority had straight shanks cleverly knotted to hold the cotton line. One hook was found with a flat copper strip wrapped to the shank with cotton, acting as a vice to hold the fishing line to the hook. Flat stones with a suspension hole seemed to be a common device found with copper fish hooks, and were presumably used for sharpening the ends of the hooks. Some fish hooks were found still attached to a long cotton cord and others with just the cotton ends still tied to the shank of the hook. Slender copper needles of differing diameters and with points at each end were attached to wooden shafts and used to spear smaller fish. Another unusual device was a hook with three to six bone or copper needles attached at one end of a wooden shaft in a flared pattern, used to spear small fish, squid and octopus. The shaft would have been tied at the other end to a long line and dropped into shallow waters, and when the squid passed by, the line would be quickly yanked upwards, and the needles would catch squid.





Harpoons were an advanced development and were made in different sizes for different size fish and marine mammals. A harpoon has several components: a forepiece with a stone flaked point and has a barb or known as a flue at one end, and at the other end a loop of gut to tie the recovery line to. A carved tapered end fit into a nesting socket at the end of the harpoon throwing pole. There are small forepieces carved of bone with thorn barbs with a gut loop lashed at the end. Medium sized wood forepieces with a cut slit at the end for inserting a flat knapped ovoid stone point and a bone barb for were used for hunting seals and very large fish. The largest forepieces were used to hunt larger marine animals such as sea lions. These larger forepieces had larger stone points and either a bone or copper barb, as well as a heavy gut or leather recovery line attached.

By using a throwing pole, a fisherman could hurl the forepoint with much greater force. All harpoon forepieces found utilized only one barb or flue. This asymmetrical shape made it less likely for the forepiece to tear loose from the lawyer of fat of the hunted fish or animal. It was only in the mid 19th century that European whalers changed from a symmetrical multi-barb harpoon to a single-barbed harpoon or flue. One large harpoon forepoint with a worked stone point and copper flue that was discovered still had a six foot length of leather attached to the shaft with a special knot that kept it from sliding off the wood shaft. It is possible that this forepoint was used to catch small whales.





A woven tulle reed harpoon quiver containing eight stone-pointed harpoons with wooden shafts was found at one of the burial sites. The reed carrier had eight pockets: four at each end. Each pocket was large enough for one harpoon. The “Porta Harpoon” or quiver was nicely decorated with red and green colored wool strings interwoven with tulle reeds. The quiver found at the burial site was most likely ceremonial for the afterlife, as the wood shafts were of a soft wood, painted red, and had no signs of wear.



At another burial site, a group of small twining weave tulle reed baskets were found, each with a different pattern. These baskets were just big enough to carry one fishing hook, one line and one stone sinker. Several different types of woven or knotted bags were also found with large spaces that allowed for fisherman to place wet shells into the bags to drain the water out.

One leather bag contained tree resin that was used as a bonding or glue-like material. The bag was made from the skin below a pelican’s beak, known as the gular pouch.





Stone sinkers of two basic types were found: long, narrow stones with a notch at each end used for tying the line, and bulbous sinkers with one notch on top to attach a line to. The narrow sinkers were also used in conjunction with carved bone barbs lashed to the sinker for larger bottom fish. A bone carved point was latched to one end of the sinker to form a “V” shape. Several sinkers have been found with the cotton line still attached. One early round stone sinker was

wrapped in gut with a loop at one end. The gut was tied in such a way that when it was wetted, the gut shrank to hold the loop tightly to the stone.



Fishing and Pre-Colombian Culture



There were several burial sites where groups of similar partially worked fishing nets were found tied together. In one burial, a corroded fishing kit was found wrapped in a net which contained fishing line, bone forepoints with thorn barbs, a sinker, and copper fish hooks which were so corroded that the entire bag was “glued” together. The entire collection was painted in red pigment, perhaps cinnabar, indicating that it was for the afterlife.



Spondylus shells found off the coast of Ecuador in waters over 200 feet deep were highly prized and traded heavily throughout the time period of the Inca Empire. These shells were also used as a source for carving highly refined fishing hooks. The shells were valued for their brilliant reflective colors, which range from deep purple, to reflective red and pink, to saturated yellow, orange, and tan, depending on the subspecies of shell. These shells were also used as insignia worn on clothing to indicate an individual’s rank within a religious or social structure.

For thousands of years, the economy along the Pacific Coast remained unchanged; only the fishing technology was different. The main source of food was fish, supplemented by minimal amounts of domesticated corn and plant foods gathered from inland. Abundant fish and shellfish remains are found throughout all of the burial sites in the region.

Fishing also provided a rich artistic culture expression along the Pacific Coast in Peru and Chile. The tools in this collection provide a direct and intimate window into the daily life and culture of the Chilean civilization from the North coast of the Chile and Southern Peru.

Fishing was a celebrated art form Pre-Colombian eras from as early as Chavin and Paracas cultures and up through the Inca Empire. Elaborate fishing scenes are painted or modeled on many Peruvian ceramics.



Top row left to right are Chavin modeled Spondylus Shell, Chavin vessel depicting a fresh water crawfish and a sea bass, and a Chimupuffer fish.

Second row L-R a Paracas bridge spout vessel depicting an eel, A Wari bowl with painted sea bass, an Inca modeled Langoustine and an early Ecuadorian bottom fish bowl.

Bottom row L-R Ecuadorian Mahi mahi, Choerra button nose dolphin. Skate, Moray eel.

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Fishing Methods & Implements Of Ancient Chile

1



Chile

7 Early Bone and Shell Hooks, 01

Shell

Lengths vary: .75" – 3"

N6017

2



Chile

Six Cactus Thorn Fish Hooks, 02

Wood

Lengths Vary: 1" – 2"

n6033

3



Chile

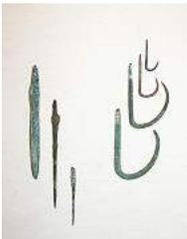
Early Fish Hooks Made of Shell, Copper and Cactus Thorn in Varying Sizes, 03

Metal

Lengths vary: 1" – 2.75"

N6016

4



Chile

Copper Spear Tips and Fish Hooks, 04

Metal

Length vary: 1.5" – 5.5"

N6018

5



Chile

Late Copper Fish Hooks with Barbs, 05

Metal

Lengths Vary: 1.50" – 2.5"

N6024

6



Chile

Four Fishing Sinkers With Attachments, 06

Stone

Lengths vary: 1.25" – 2.5"

n6036

Fishing Methods & Implements Of Ancient Chile

7



Chile

Thirteen Varied Stone Sinkers, 07

Stone

Bulbous sinkers: 1.75" – 3" L

Oblong sinkers: 1.5"–7" L

n6037

8



Chile

Three Claming Tools With Napped Broad Points, 08

Wood

Length: 9" each.

n6030

9



Chile

Two Early Carved Wooden Harpoon Points Painted with Red Stripes, 09

Wood

Length: 7"

n6029

10



Chile

Three Arrows with Wood Shafts and Napped Quartz Points, 10

Wood

Length: 10"

n6031

11



Chile

Arrow with Quartz Point and Feather Fletching, 11

Wood

Length: 10"

n6034

12



Chile

Three Early Seal Harpoons with Oval Stone Points, Bone Barbs and Wood Shafts, 12

Wood

Length: 9"–10"

n6028

Fishing Methods & Implements Of Ancient Chile

13



Chile

Two Harpoon Forepoints with Bone and Copper Barbs, 13

Wood

Lengths: 12" & 16"

n6035

14



Chile

Arica Harpoon Quiver With Eight Harpoons, 15 Ed.

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1jpg.jpg

Wood

Length: 23" x Width: 7"

n6041

15



Chile

Eight Twined Baskets For Fishing Line and Hooks, 16

16

Wood

Height: 1.25" - 1.75"

N6025

16



Chile

Large Whaling Harpoon Forepiece with Stone Point, Copper Barb, and Original Leather Line, 17

Wood

Harpoon: 18.5" L

Line: approx 4.5"

n6040

17



Chile

Three Types of Bags used by Fisherman, 17

Textile

Lengths vary: 3"-8"

n6045

Fishing Methods & Implements Of Ancient Chile

18



Chile

*Tools for Chipping and Cutting with Copper Blade
in Wood Case, 18*

Stone

Length 1. 8"

N6015

19



Chile

*Three Bone Tools for Chipping and Opening Clam
Shells, 19*

Bone

Lengths Vary: 5.75" - 8"

n6032

20



Chile

Two Stingray Stingers with Bone Container, 20

Bone

Length: 3"

n6026

21



Chile

*Copper Fish Hooks and Copper Needles for
Spearing, with Sharpening Stone, 21*

Metal

Length: 1" - 2.5"

N6022

22



Chile

*Pelican Beak Leather Pouch Filled with Tree Resin
Crystals, 22*

Other

Diameter: Approx. 4"

n6042

23



Chile

*Three Copper Drill Bits and Two Wood Drill Chucks,
23*

Wood

Length: 2.5"

n6027

Fishing Methods & Implements Of Ancient Chile

24



Chile

Three Carved Bone Barbs with Measuring Tool, 24

Bone

Length: 2"

n6044

25



Chile

7 Bone Carved Barbs for Harpoon, 25

Bone

Length: 2" - 3.5"

N6020

26



Chile

Bone and Thorn Harpoon Forepieces as Works in Progress, 26

Wood

Lengths vary: 1" - 5"

N6023

27



Chile

Four Bone and Thorn Harpoon Forepoints Lashed Together with Leather, 27

Bone

Length: 8"

n6039

28



Chile

Harpoon Forepoint with Original Cotton Cord, 28

Textile

Length of cord: approx. 26"

n6038

29



Chile

Fishermans' Kit for the Afterlife, 29

Textile

Length: 6"

n6043