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RAPANUI PADDLES AND THE BOUNTIFUL SEA

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ABSTRACT: Rapanui paddles used in the eighteenth and nineteenth centuries are unusual in that they are composite; their pararaha 'blades' are of a very particular shape that has no parallels on other Polynesian islands. Museum collections contain at least ten paddle blades collected in the late nineteenth century, all of them featuring a longitudinal upright that ends in a rounded bulge. The back side of the blade can be flat, slightly concave or carved with a longitudinal groove. Iconographic analysis of pararaha 21.1D from Museo de La Merced revealed that unusual shapes on both sides of the paddle blade represent stylised depictions of male and female genitalia. Although the back of the paddle, shaped like komari 'female genitalia', may be of later development, the prominent phallic upright on the front side of the blade is characteristic of all known pararaha. This iconographic identification suggests that Rapanui paddles, documented since the La Pérouse expedition of 1786, might have been considered to possess special magical powers relating to "fertilisation" of ocean waters during routine paddling, thus ensuring bountiful produce from the sea. The power of the paddle may have been enhanced by inlaid bones or teeth, two examples of which are known among the surviving pararaha and detailed here.

Keywords: canoe paddle, paddle blade, pararaha, fertility cult, iconography, Rapa Nui, Easter Island

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Rapa Nui (Easter Island) is famous for its monumental architecture and monolithic statues known as *moai ma'ea*. The geographical location of the island, thousands of kilometres away from the nearest populated islands of Oceania and the shores of South America, suggests that the initial Polynesian discovery most likely constituted the single settlement event. From that time the island's society developed in isolation. When the Polynesians arrived, the island was densely forested (Flenley 1993: 44 fig. 50). The main tall tree was a palm, *Paschalococos disperta* (Dransfield *et al*. 1984), but other species of the original woody vegetation have been identified in the past few decades (Orliac 1998). The palm forests diminished progressively due

to human activity (Mieth and Bork 2010) and/or climatic change (Orliac and Orliac 2008a: 26; Roman *et al.* 2021: 13 fig. 8) until the island's forests were completely gone. Reports of the early European visitors to the island (Roggeveen, González and Haedo, Cook and La Pérouse) are unanimous in their descriptions of a steppe landscape devoid of tall trees. This scarcity of wood had a marked influence on Rapanui fishing vessels, as remarked by Roggeveen in 1722:

> Finally, as to their seagoing craft, they are of poor and flimsy construction; for their canoes are fitted together of a number of small boards and light frames, which they skilfully lace together with very fine laid twine made from the above-mentioned vegetable product *Piet*. But as they lack the knowledge, and especially the material, for caulking the great number of seams of their canoes, and making them tight, they consequently leak a great deal; on account of which they are necessitated to spend half their time in baling [*sic*]. Their canoes are about ten feet long, not counting the high and pointed stem and stern pieces. Their width is such that, with their legs packed close together, they can just sit in them so as to paddle ahead. (Corney 1908: 19)

Two launches (lifeboats) of the 1770 Spanish expedition circumnavigated the island; they saw

> two little canoes … with two men in each, making for the *Santa Rosalia*'s launch; so we waited for them in order that they might join our party. … These canoes are constructed of five extremely narrow boards (on account of there being no thick timber in the country) about a *cuarta* in width [one-quarter of a *vara* or yard]; they are consequently so crank that they are provided with an outrigger to prevent them from capsizing; and I think that these are the only ones in the whole of the island. They are fitted together with wooden pegs in place of nails. (Corney 1908: 121)

Although in the late period of the island's history canoes were scarce, it was not always so. Canoe motifs are abundant in the corpus of Rapanui rock art (Lee 1992: 104–11). A few are crossed with a diagonal segment (Van Tilburg *et al.* 2019: 270), conveying the notion of a paddle. The first European depiction of Rapanui paddlers appears in Johann Reinhold Forster's manuscript dating to the Cook expedition of 1774 (Van Tilburg 1994: 51 fig. 34). Two paddles are shown schematically, with flat blades ending with a straight segment—however, the line representing the paddle shaft continues up to the end of the blade. Forster mentioned that these paddles were in fact composite: "each of the men [in a canoe] had a paddle made of more than one piece [of wood], which sufficiently proves the want of wood on this isle" (in Von Saher 1999: 43). Another example of the flat

paddle blade was documented by Louis Choris (Guiot 2018: 32 fig. 3; see also Chauvet 1935: pl. 11 fig. 18), who visited the island in 1816 on Otto von Kotzebue's expedition. The same image shows a paddle with an elliptic lower blade and round upper blade decorated with a face, labelled as a Rapanui object. Although ceremonial paddles made on the island have faces carved or painted on their blades, the paddle shape is different. This suggests that Choris's drawings of paddles might have been made from memory—or alternatively, the flat paddle might have come as a trophy from a passing ship. Either way, the evidence for flat-bottomed Rapanui paddles should be considered with caution.

A more detailed drawing of a running Rapanui canoe was produced by Blondela and later engraved by Masquelier (Fig. 1b, a). These images date back to the La Pérouse expedition of 1786. The engraving shows a woman holding a paddle with an uncommon blade—it is composed of several planks set at angles to each other, expanding radially in star-like fashion (Fig. 1c). This shape looks completely out of place, resembling more an oversized confectioner's whisk than a paddle. The original sketch (Fig. 1d) shows this paddle blade more realistically, with a single upright projecting perpendicularly to its blade. What was its purpose?

Two complete paddles (Fig. 2a) of the same unusual shape were collected in 1886 by the USS *Mohican* expedition and deposited to the National Museum of Natural History, Smithsonian Institution, inventory no. E129746. The description of these objects is as follows:

> *Ancient scull oars*—Called Mata Kao. Angular float of peculiar shape and unique design attached to a long handle. Used for steering and sculling very large canoes. Very old and highly prized by the islanders as the only specimen of the scull-oar used by their ancestors. (Thomson 1891: 538)

The images from La Pérouse expedition confirm that these paddles were in use on the island in 1786; a watercolour produced by John Linton Palmer in the 1850s depicts a Rapanui man sitting on outrigger canoe (*vaka ʻama*) holding a two-piece paddle (Guiot 2018: 34 fig. 4; see also Van Tilburg 1996: 29 image 41). Although this paddle is drawn schematically, the shape of its blade matches well the ethnological specimens collected by Thomson. Thus, one can speak of a tradition of using composite paddles on Rapa Nui, witnessed by the European visitors from the late eighteenth century and continuing past the first half of the nineteenth century, possibly even extending into the missionary era that started with the arrival of Brother Eugène Eyraud in 1864. Some of the old paddles survived by the late 1880s; they were eventually collected and deposited in several museums worldwide.

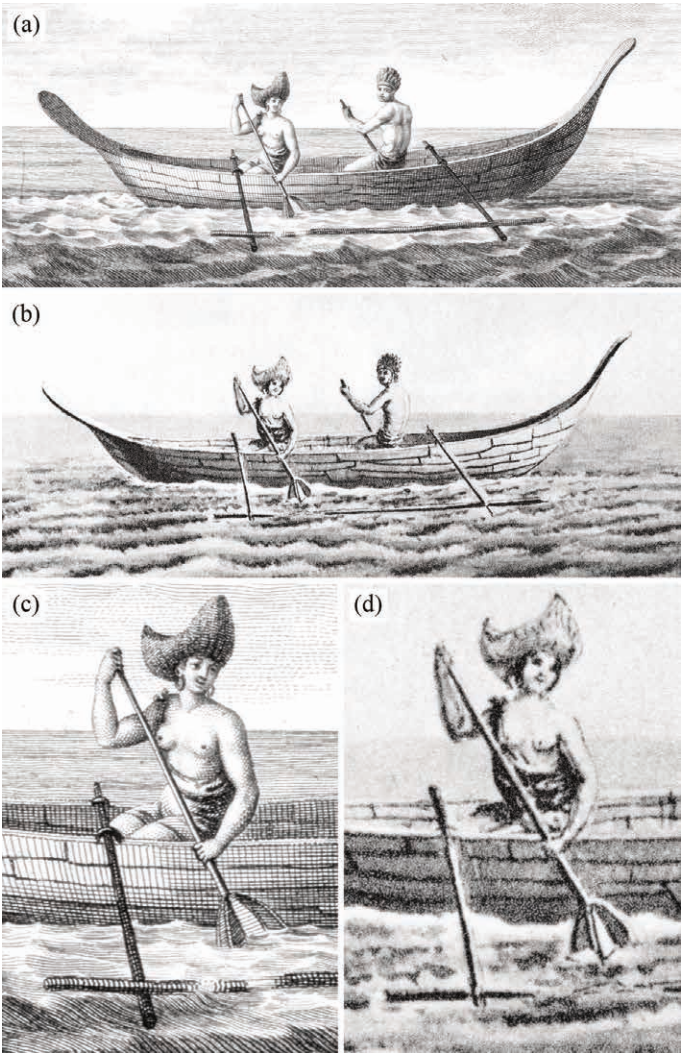

Figure 1. Rapanui outrigger canoe navigated by two paddlers: (a, c) engraving by Masquelier, *Atlas du Voyage de La Pérouse* (Milet-Mureau 1797: pl. 61), showing a woman using a paddle with multiple uprights; (b, d) sketch by Blondela (Chauvet 1935: pl. 11 fig. 19) showing a paddle with a single upright, reconcilable with the shape of a *pararaha* 'paddle blade'.

Before continuing with the discussion, it seems worthwhile to present a brief overview of terminology. Paddles, oars and sculls are used for propelling watercraft. All are composed of a shaft (the long, thin cylindrical part) and a blade (the wide flat part) and look very similar; the difference in names reflects the way in which these objects are used. A paddle is a tool held by the paddler in one or both hands; it is not connected to canoe's hull in any way. Rapanui people navigating a canoe (Fig. 1) use paddles, paddling on opposite sides of the vessel to compensate for forces directed sideways, thus running the canoe straight ahead. Oars differ from paddles in that they are physically joined to gunwales by oarlocks. An oarsman moves the tip of the oar shaft, located inside the boat, causing the oar to pivot around the oarlock joint. The oars are set in pairs on the two sides of the hull; the oarsmen perform sweep rowing by coordinated motion of the oars. For a very narrow watercraft, two oars set on both sides of the hull can be operated simultaneously by a single person—in this case they are called sculls, and the person is called a sculler.

Thomson's identification of Rapanui objects as scull oars was perhaps prompted in part by their similar size, suggesting that these rowing implements represented a pair. However, scull oars require oarlocks—a feature that should be reflected somehow in their construction. In contrast, the shafts of the objects collected by Thomson are thoroughly smooth; they do not have any structural detail—or marked localised traces of erosion—that would permit establishment of a point at which their shafts were mounted on a gunwale. Therefore, they are neither oars nor sculls—they are paddles. The remarkable point about these paddles (the old Rapanui term is *matakao*, the modern word *hoe*; Cea Egaña 1979–1981: 89) concerns their composite nature. The blade is a separate object called *pararaha*—meaning 'flat' in Rapanui (Englert 1948: 483); the term is general, so that *pararaha rima* ('flat' + 'hand') stands for 'palm of the hand'—joined to a shaft called *kukuru* ('shaft', Englert 1948: 464) with lashings. No other Polynesian society used composite paddles (Esen-Baur and Forment 1990: 304).

The shape of the paddle blade is very peculiar (Fig. 3). It is (almost) flat on one side, which will be referred further as the "back side". The opposite "front side" of the blade has a long vertical upright running along its central axis, which terminates in a bulge that can either be flat (Fig. 3a, b) or descend towards the main surface of the blade (Fig. 2a). Métraux (1940: 209) recorded the name for this feature: *ponga kekepu* 'turtle's snout'. The term is likely descriptive, although neither the front nor side view of the paddle blade evokes an animal snout. As published specimens—for example, Thomson's plate 59 (Fig. 2a)—show paddles standing on the floor with their blades pointing upwards, these surface formations resemble a stylised depiction of a human face. Indeed, large ceremonial paddles (*'ao*) and smaller dance

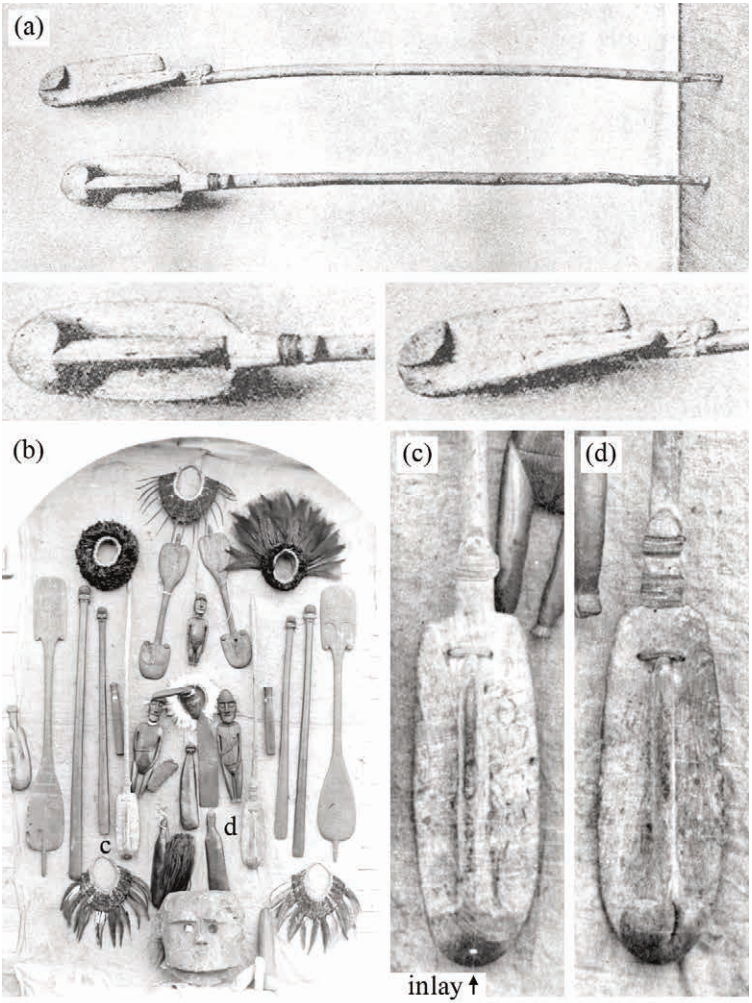

Figure 2. Composite Rapanui paddles documented in the late nineteenth century: (a) two complete paddles E129746 acquired in 1886 with close-ups of their blades (Thomson 1891: pl. 59); (b) Salmon's collection of Rapanui objects photographed by W. Safford of the USS *Mohican* (image NAA 04951300 courtesy of the National Anthropological Archives, Smithsonian Institution); (c, d) close-ups from the latter image, showing the blades of two paddles later acquired by J.L. Young.

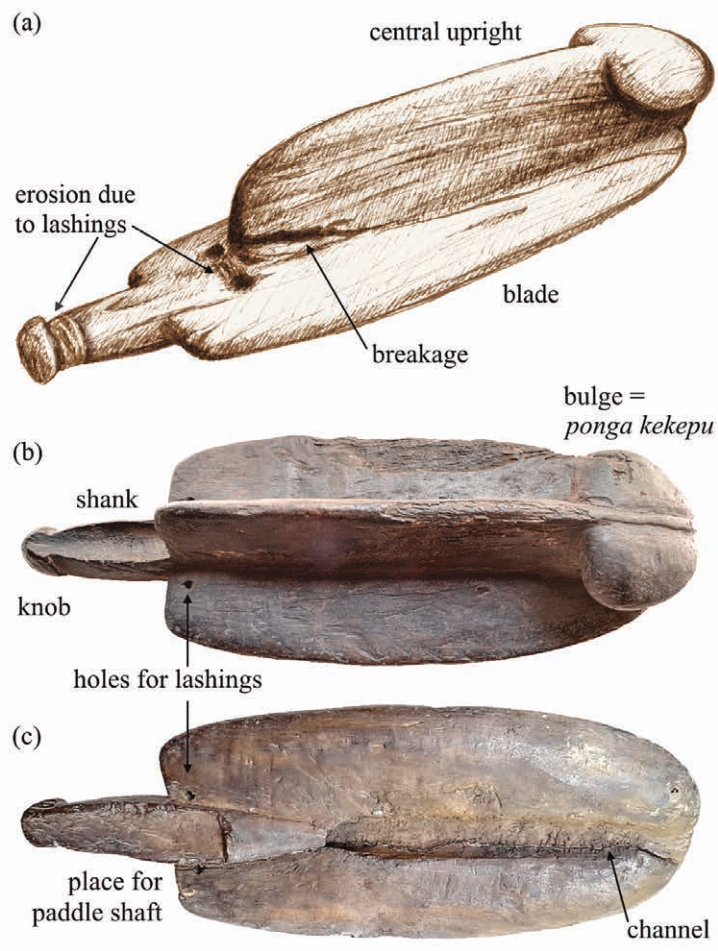

Figure 3. The principal structural features of the paddle blade: (a) the Berlin pararaha VI 4919 (after Ayres and Ayres 1995: 149 pl. 46); (b, c) front and back views of the La Merced pararaha 21.1D (images courtesy of Museo de La Merced; photographs by José Miguel Ramírez-Aliaga) showing that the principal structural elements of the paddle blade represent stylised depictions of male and female genitalia.

paddles (*rapa*) feature stylised human faces on their upper blades (Fig. 4). The ‘ao are larger, offering sufficient space for carving of the eyes, nose and mouth. On rapa, the face is reduced to a rounded M-shaped ridge that represents the eyebrows and nose; hemispherical bulges stand for ear spools. The rounded upper part of the blade evokes a feather headdress; some elaborate ‘ao show individual feathers, delineated with incised grooves or marked with a pigment. Therefore, it is understandable that carvings on a pararaha blade might have been interpreted as a human face, with an upright representing its nose and the bulge seen as a schematic depiction of the eyebrows and forehead.

Pararaha do not appear in Rapanui petroglyphs (in contrast to the ‘ao ceremonial paddles), but they are known from three-dimensional stone carvings. These specimens were discovered by Thor Heyerdahl, who, during his stay on Rapa Nui leading the excavations of the Norwegian

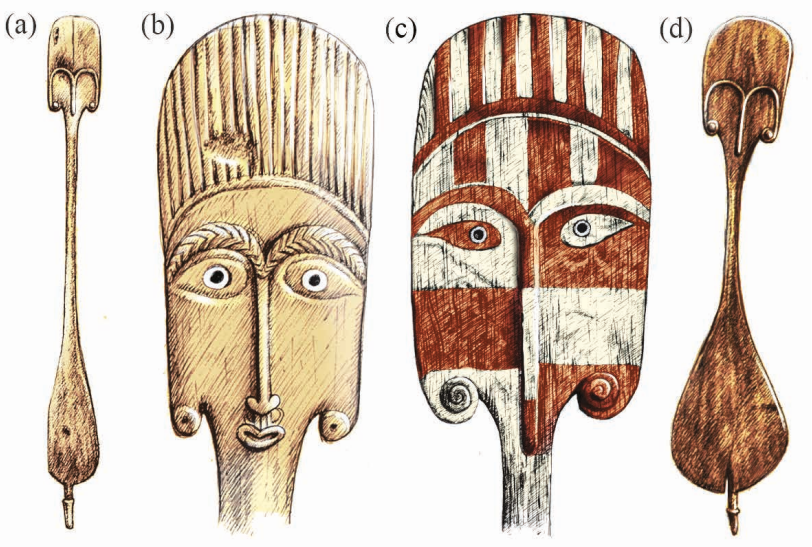

Figure 4. ‘Ao and rapa ceremonial paddles represent stylised depictions of a human with face, a feather crown, and a phallic appendage at the bottom blade: (a) ‘ao ETH AC 1248 in the Museum of Natural History, Toulouse (after Orliac and Orliac 2008b: 65); (b) ‘ao 22845 in the Ethnology Museum, Vienna (after Heyerdahl 1975: pl. 55b); (c) ‘ao E129749 in the Smithsonian Institution, Washington (after Thomson 1891: pl. 52); (d) rapa in the J.-P. Meyer collection (after Orliac and Orliac 2008b: 61).

Archaeological Expedition to Easter Island and the East Pacific in 1955–1956, began to receive offers from Rapanui people to show him treasure troves kept in secret family caves along the coast. The treasures turned out to be a variety of small aberrant stone sculptures carved out of vesicular lava boulders. In form they were very similar to museum specimens collected in the nineteenth century and labelled by their collectors as "house gods". These stones were usually placed outside the entrance to the low, thatched, canoe-shaped sleeping huts in the fashion of that time. Thor Heyerdahl decided to collect as many such stone sculptures as he could. He called them "cave stones" and believed that they could give researchers insights into the variety of motifs present in ancient Rapanui art, although he accepted that many, or even most, of these stones were carved during late proto-historic or even historic times. There are 934 such stone sculptures registered today in the Kon-Tiki Museum collection. Recent testimony from members of the Rapanui community indicates that the majority of these stones were carved during Heyerdahl's stay on the island, although observations made in some of the caves when first entered indicated that they had been untouched for a considerable time (Heyerdahl 1975: 124–25, 130, 142). In any case, these stone sculptures frequently represent copies of well-documented rock art or sculptures from Rapa Nui's pre- and proto-history and as such they may provide important information about Rapanui art and culture. The cave stone sculptures continue to attract attention due to the size and completeness of the collection, which permits in-depth iconographic studies and cross-comparisons with other artistic media used by the Rapanui. Some of these stone sculptures are currently on loan to other museum collections; they are also frequently displayed at temporary exhibitions dedicated to Rapanui culture.

A small number of Heyerdahl's (1975: pl. 272d–f) "cave stones" represent pararaha and have surface formations resembling stylised faces. The 3D model of artefact K-T 1530 (Fig. 5) was made with Agisoft PhotoScan and rendered with CNR-ISTI Visual Computing Lab's MeshLab (Cignoni *et al*. 2008) using ambient occlusion and radiance scaling filters. Through this approach, the texture of the object is removed but its overall shape and surface relief details are emphasised, permitting direct and convenient study of the object's geometry (Horley *et al*. 2019). We are pleased to publish the 3D model of K-T 1530 embedded in Figure 5 for this online version of the article, to familiarise the readers with the peculiar shape of Rapanui paddle blades. As one can see from Figure 5 and the 3D model, the ponga kekepu bulge is divided into two parts, each carved as a hollowed "hemisphere". The upright extends quite deeply into this formation, resembling a nose set between overhanging eyebrows. The lashing holes are neither shown nor even hinted at with simple indentations. The shank is asymmetrical and looks rather like a handle. The overall shape of the object is markedly oval, with a different aspect ratio in

comparison to that observed in real-life pararaha (Fig. 2c, d). Curiously, the back side of the carving is slightly sunken, with a shallow spoon-like shape.

Another stone sculpture collected by Heyerdahl, K-T 1531, was photographically documented (Fig. 6), illustrating the vesicular structure of its reddish-brown rock. The side flanges of the paddle blade are carefully bevelled and polished; the central upright is thin and continues up into the

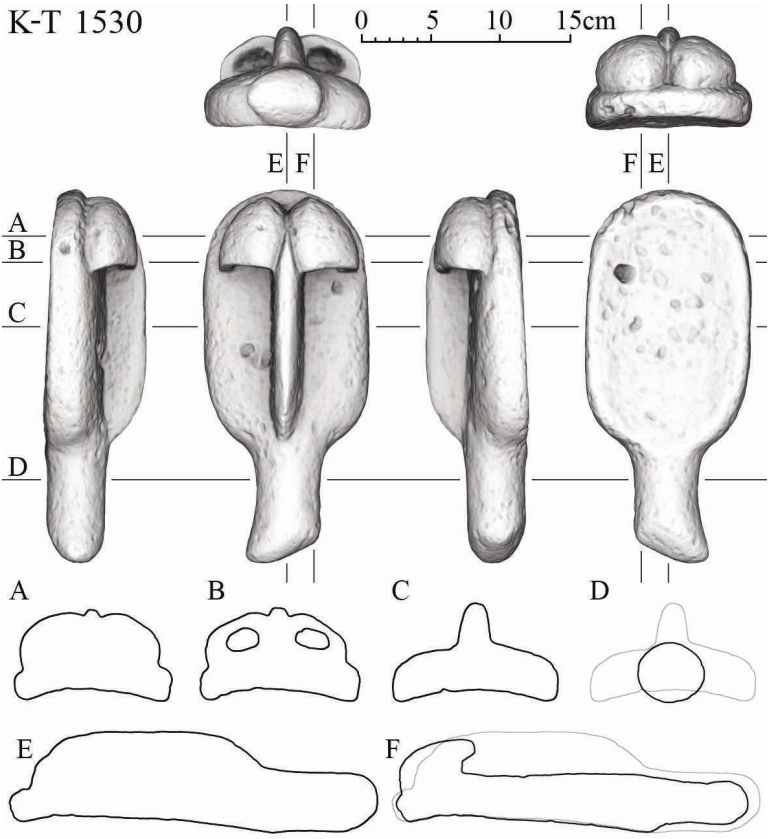

Figure 5. Principal orthographic views and cross-sections of pararaha cave stone K-T 1530 rendered for a 3D model obtained through photogrammetric reconstruction (images courtesy of the Kon-Tiki Museum). The 3D interactive model can be click activated when this PDF article is downloaded to your computer.

middle of the ponga kekepu, which is notably bipartite. The interiors of these parts are concave; the rock here is slightly darker in tone, which may either represent accumulated dirt or be a consequence of rock colour change if sunken parts were made by abrasive drilling. The back side of the paddle is carefully polished; similar to K-T 1530, its sunken surface resembles that of a shallow spoon. Both objects evoke stylised faces; perhaps because of

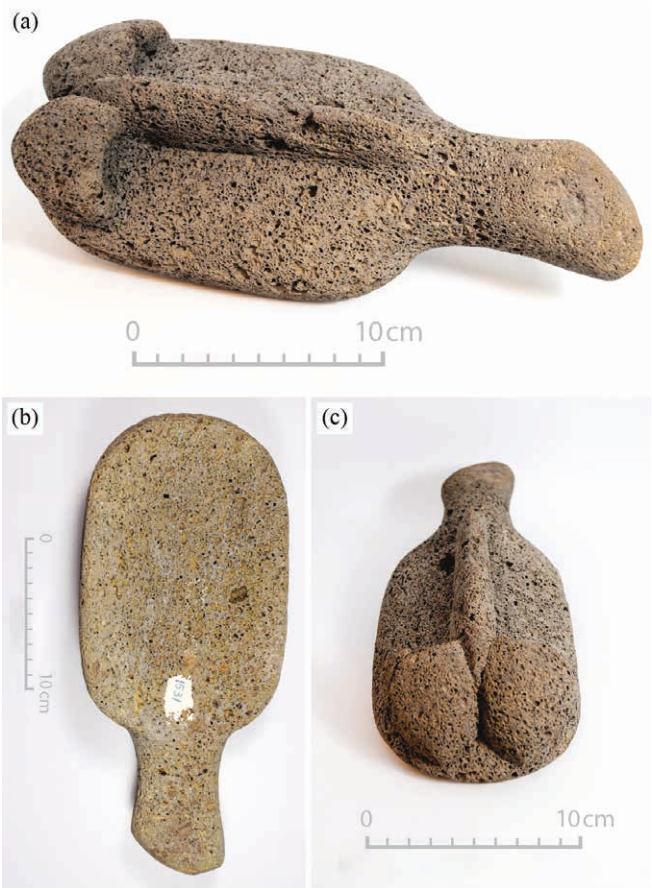

Figure 6. Pararaha cave stone K-T 1531 showing the porous nature of the volcanic rock from which it was carved. The stone was polished, producing a smoother surface in the areas with fewer pores (images courtesy of the Kon-Tiki Museum; photographs by Reidar Solsvik).

this, Heyerdahl was of opinion that these stone specimens represented "an unidentified object, probably a charm identical to wooden specimens brought from Easter Island in the last century [by Thomson] and mistaken for blades of skull oars" (Heyerdahl 1975: pl. 272).

Thus, when at least some of these artefacts were produced, the exact shape and proportions of paddle blades were seemingly in part forgotten. The absence of models within the sculptors' reach means that by a certain time—most likely the close of the nineteenth century—there were no specimens of ancient paddles left on the island.

At least ten authentic wooden pararaha are known from museum collections worldwide:

* Ethnological Museum, Dahlem, Berlin (Ayres and Ayres 1995: 148):
  (i) VI 4919, collected by Geiseler in 1882. Blade size: 53 × 15 × 9.8 cm (Fig. 3a).
  (ii) VI 4893, collected by Schlubach in 1882. Blade size: 49 × 13.5 × 8.5 cm.
  (iii) VI 4894, collected by Schlubach in 1882. Blade size: 51 × 13.5 × 7.7 cm.

* Smithsonian Institution, Washington (Thomson 1891: 538):
  (iv, v) E129746, two complete paddles collected by Thomson in 1886 (Fig. 2a). The online collection database of the Smithsonian Institution mentions that these paddles are about 6 feet (2 m) long, measured together with their shafts.

* Bernice Pauahi Bishop Museum, Honolulu (Métraux 1940: 209):
  (vi–viii) B3631, three (complete?) paddles proceeding from Young's collection and deposited to the Museum in 1920 (Fig. 2c, d; Fig. 7). One of the blades measures 55.2 × 13.3 cm with a shank 10.6 × 5.2 cm in size. The heights of the uprights on the three specimens are given as 9.3 cm for one and 7.2 cm for the other two, without specifying which object has which. One paddle blade is peculiar in that its ponga kekepu has been inlaid with a tooth or a piece of bone.

* Museo de La Merced, Santiago (Ramírez-Aliaga 2008: 45):
  (ix) 21.1D, deposited to the Museum in 1870. Blade size: 39.7 × 14.5 × 9 cm (Fig. 3b, c; Fig. 8).
  (x) 21.2D, deposited to the Museum in 1870. Blade size: 44.3 × 12 × 11.5 cm (Fig. 11).

The study of the archival material yielded more data about pararaha collection events. The crew of the USS *Mohican* took a considerable number of photographs on Rapa Nui, including several images of ethnographic collections belonging to Alexander Paea Salmon, then manager of the island's

sheep ranch, who helped Thomson with the acquisition of ethnological specimens for the Smithsonian Institution. One of these photographs shows an assortment of wooden and stone objects including two tablets with Rapanui script—now preserved in the Smithsonian Institution (Fig. 2b). The latter photograph was published for the first time by Harry O. Sandberg with the following caption:

> Easter Island Antiquities. Photograph by Prof. W.E. Safford. Idols carved of hardwood with obsidian and shell eyes; ceremonial paddles; ceremonial scepters or clubs; small clubs for beating bark of paper mulberry to make "tapa" or bark cloth; feature [*sic*, feather] headdresses. (Sandberg 1912: 909)

William Safford is credited for a large number of photographs produced during the USS *Mohican* expedition of 1886 (Horley 2009: 12). Among these objects, one can distinguish two paddles (marked "c" and "d" in the photograph). It is logical to assume that these are the same paddles deposited to the Smithsonian Institution, especially because Thomson (1891: 538) explicitly says that they were "the only specimen[s] of the scull-oar[s]". A more careful look on close-up panels reveals that pararaha lashings differ from those observed on the Smithsonian paddles (Fig. 2a). Moreover, the ratio of total paddle length to blade length produces the values of 3.42 and 3.15 for the paddles marked "c" and "d", while the same ratios for the paddles shown in Fig. 2a are 3.73 and 3.96, correspondingly. In other words, the shafts of the Smithsonian paddles are considerably longer. Therefore, the paddles pictured in Fig. 2b are apparently not the ones collected by Thomson—and hence he saw more paddles than he acquired. Remarkably, paddle "c" features a white spot in its bulge, which corresponds to the location of an inlaid bone or tooth documented by Métraux (1940: 209 fig. 19). The second paddle with a crack splitting its ponga kekepu matches the paddle documented in the photograph taken on Tahiti by the Spitz Photographic Studio (Fig. 7). This is one of several images depicting items from the ethnographic collection of James Lyle Young (Anna Petersen, pers. comm., 2021), who acquired some of his objects through a reliable agent on Rapa Nui, most likely Alexander Paea Salmon (Fischer 1997: 459). Thus, although Young's collection was deposited in the Bernice Pauahi Bishop Museum in 1920, both paddles were photographically documented by Safford on Rapa Nui back in 1886, confirming that these objects are old and authentic. The photograph taken on Tahiti must be dated after December 1888, when Salmon returned from Rapa Nui (Fischer 1997: 71), most likely bringing with him his ethnological collection. Four ceremonial paddles (two large ʻao B3686 and two late rapa B3632 of somewhat simplified design) appearing in the same photograph (Fig. 7) can also be seen in Safford's photograph, establishing slightly earlier provenance for these objects as well.

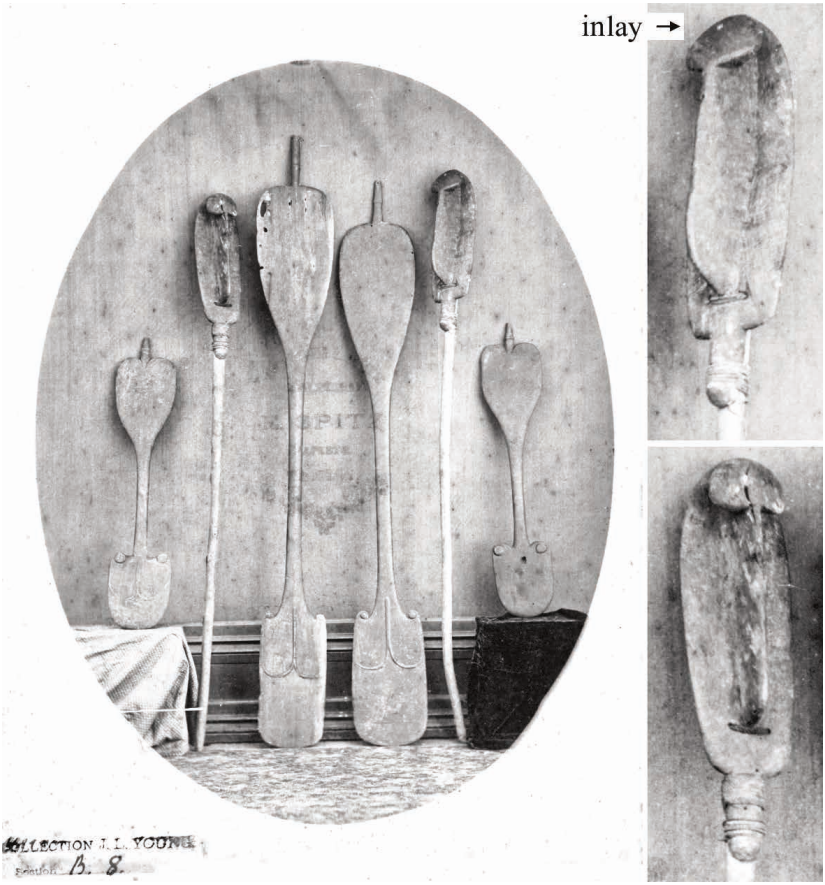

Figure 7. Rapanui paddles from the J.L. Young collection ("Six wooden panels", n.d., Spitz Photographic Studio, Pape'ete, Tahiti, P1998-067-003, Hocken Collections | Uare Taoka o Hākena, University of Otago). Close-ups of pararaha blades permitting identification with the paddles documented by W. Safford in 1886: (top) compare with Fig. 2c, (bottom) with Fig. 2d. (Image courtesy of Hocken Collections | Uare Taoka o Hākena, University of Otago.)

The unusual geometry of pararaha blades has received different interpretations in the literature, being considered as an ingenious piece of ancient engineering designed to achieve more efficient paddling or offering other remarkable functions:

> The blade itself has a high median flange … This crest terminates in a round and flattened knob somewhat compressed in front. This knob (*ponga kekepu*), probably intended to give a pendulum swing to the paddle, rejoins in a continuous curved line the surface of the front side. (Métraux 1940: 209)

> The propulsion of these small pirogues was performed, fundamentally, with oars of the paddle type called Matakao with shaft (Kukuro) and relatively narrow blade (Pararaha) provided, along its entire central line, with a high and sharp fin, with a slightly convex border that served to facilitate the oblique forward raising of the oar after the stroke or, in the opinion of other informants, it was constructed in this way with the aim of allowing, by striking the water [surface], [one to make] an intense noise that attracted fish. (Cea Egaña 1979–1981: 85, translated from Spanish by the authors)

THE LA MERCED SPECIMENS

La Merced Paddle Blade 21.1D

Questions about pararaha designs obtain a straightforward, unexpected and effective solution with analysis of the paddle blade 21.1D from Museo de La Merced (Fig. 3b, c). This specimen was overlooked in the literature until publication of front and back views of it by Ramírez-Aliaga (2008: 45). The paddle blade is very carefully shaped, suggesting the dedicated work of an experienced craftsman. Its front side has an upright that continues as a narrow low ridge over the entire ponga kekepu. The back side of the paddle features a deep sunken channel and the external edges of the blade are bevelled.

Métraux (1940: 209) mentions that paddles had "a very light depression in the middle which is more accentuated, almost a groove, in the modern pieces". We can safely assume that this side of the paddle blade was directed towards the stern of the canoe. To begin with, historical drawings specifically document this orientation of pararaha during the forward paddle stroke (Fig. 1d). The curvature of the paddle shaft also supports such an interpretation (Figs 2a, 7). The sunken back sides of the pararaha cave stones K-T 1530 (Fig. 5C) and K-T 1531 (Fig. 6b) evoke a shallow spoon. Careful optimisation of this shape in modern racing wing paddles serves for boosting their forward thrust. It may be that the ancient Rapanui were experimenting in this direction by modifying one side of the blade for more efficient paddling. However, further evolution of this shape went in a completely different direction.

The shank on the back side of the La Merced paddle blade features a flat-bottomed concavity for receiving the paddle shaft. There is a marked stopper against which the shaft was propped; surprisingly, the shank continues with

a long conical-shaped appendage. The apex of the cone is placed on top of a deep longitudinal channel that goes along the middle of the blade down to its tip. The general appearance of this side, in accordance with iconographical canons of Rapanui art is that of stylised female genitalia, *komari* in Rapanui language (Englert 1948: 463): the paddle flanges correspond to the labia and the conical piece under the shaft represents an elongated clitoris. This shape was not seen as an exaggeration in ancient Rapanui society, which had special rites and procedures for the enhancement of female private parts (Kaeppler and Van Tilburg 2020).

Even more astonishingly, the channel seen on the back side of the paddle blade 21.1D continues through the entire pararaha, piercing it at an angle and surfacing on the front side of the shank, just under the central upright (Fig. 8a–c). It is unclear how this channel was formed; its cross-section is markedly round with a diameter of about 3 cm. It may be that the pararaha was initially pierced by drilling and further channel expansion and smoothing achieved via a tool that could be rotated (e.g., a stick wrapped in a shark skin), ensuring the round section of the channel. Mechanical stress produced by drilling would have been considerable, and indeed one of the channel walls at the base of the central upright opens up into a large fissure (Fig. 8a). Remarkably, the front side of the shaft is also round and sunken (Fig. 8b, d).

The channel-bearing La Merced pararaha 21.1D is unique. The need for this channel—as well as its possible use—is completely unclear. The inner surface of the channel observed from the back side of the paddle blade is rather smooth, with perpendicular marks or cuts that were likely produced using carving or polishing tools (Fig. 8e, f). It may be that the channel was made for inserting the paddle shaft, perhaps because the sunken area on the back side of the shank was not considered deep enough for firm shank fixation. At the same time, the technical effort and skill required to perforate the paddle blade with a channel running at an angle to its long axis[1] are far superior in complexity and labour demand in comparison to the job required for hollowing the back side of the shank to a greater depth. Moreover, there is no apparent threshold within the channel against which the shaft could be propped; it would be very unusual if the shaft had to extend beyond the lower edge of the paddle blade. On the other hand, if one considers the channel as a part of a komari motif, it becomes apparent that its spatial position in relation to other parts of the same design is completely correct anatomically, further reinforcing the hypothesis that the back side of this blade was purposefully shaped as female genitalia.

But are we perhaps dealing with a ceremonial object and not a utilitarian paddle, such that the uniqueness of its shape should be taken for granted? To answer this question, we studied the wear patterns of La Merced pararaha 21.1D. The wooden shaft (kukuru) was expected to be placed into the hollowed area at the back side of the paddle shank. Although traces of tool

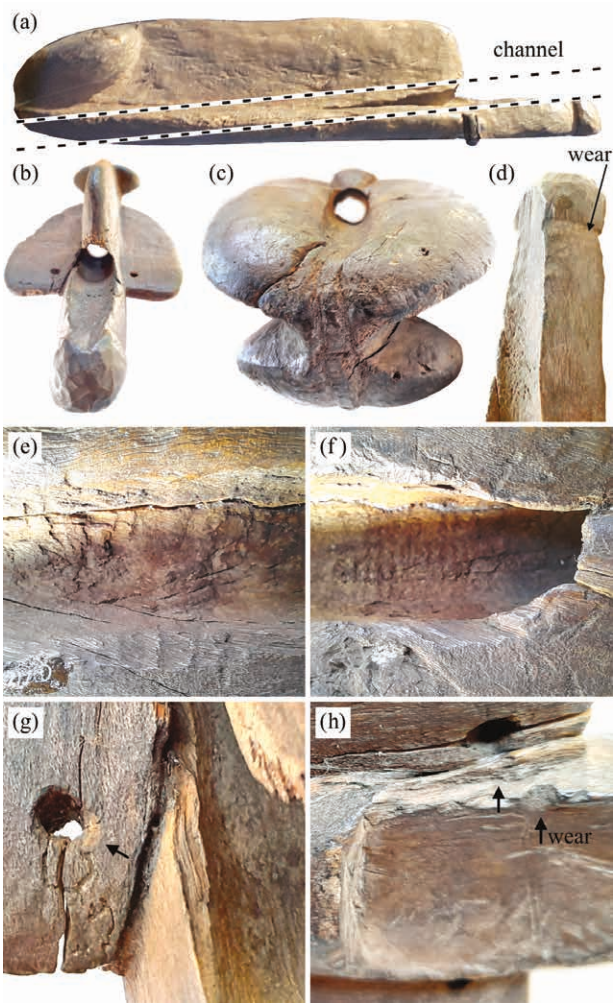

Figure 8. La Merced pararaha 21.1D (images courtesy of Museo de La Merced; photographs by José Miguel Ramírez-Aliaga): (a) side view marking the position of the channel cutting through the paddle blade; (b, c) views from the shank (front side) and ponga kekepu (back side) showing the channel with round cross-section cutting through the pararaha lengthwise; (d) shank with traces of wearing produced by lashing cord under the knob; (e, f) tool marks inside the channel, observed from the back side of the paddle; (g, h) erosion of lashing holes and their surroundings (marked with arrows) proving that this pararaha was once fastened to a shaft.

marks in this area can be discerned (suggesting a quite short active period for the object), it is also apparent that the wood is eroded in the central part of the shank close to the propping edge (Figs 3c, 8h), which is a completely expected wearing pattern. The shaft has to be held in place by lashings, with at least one turn of a cord passing through perforations at the base of the shank. It is important to note that La Merced blade 21.1D has the central upright extending up to its shank (Fig. 3b), so that there is no way of passing the lashings from one hole to another along the flat surface, as is the case, for example, on the Berlin paddle VI 4919 (Fig. 3a). Instead, the lashing cord would have gone around the back vertical ridge of the central upright, rising at an angle from the lashing hole. Namely this kind of localised erosion characterises the lashing hole at the pararaha's front side (Fig. 8g). On the back side of the paddle, cord erosion marks can be seen at the edge of the hole and at the sides of the shank (Fig. 8h). The second lashing cord was likely tied around the upper part of the shank just under the knob (Fig. 2a, c, d); wearing traces induced by lashings can be distinguished in the very same spot of La Merced pararaha 21.1D (Fig. 8d). In other words, the paddle blade in question was indeed fastened to the shaft for some time. Moreover, the tip of the paddle shows traces of compressive damage and fissures (Fig. 8c), as would be expected to form when the paddle hits rocks (Orliac and Orliac 2008a: 253) either on shore or in shallow water. The presence of erosion patterns consistent with paddling activities suggests that this pararaha was not made as a ceremonial object. At the same time, the degree of erosion on La Merced blade 21.1D is not very prominent, arguing for its short utilitarian life prior to collection.

Identification of the paddle's back as depicting female genitalia offers a straightforward explanation for the upright carving on its front side—that it is male genitalia or *ure* in Rapanui (Englert 1948: 509). The motif is directed downwards, terminating at the tip of the paddle blade. In this way, both organs are shown in anatomically correct orientation when the paddle is held with its blade pointing downward, as when it is submerged into water during paddling. This iconographic analysis provides a direct explanation for the rounded shape of the ponga kekepu bulge. The upright on which it is set emphasises the design, making it three-dimensional. It becomes clear that the flat or rounded ponga kekepu (Figs 3a, b; 2a) represents the same phallic motif. This difference in shape is not based on the functionality or hydrodynamic properties of the paddle: the principal purpose of the upright with the ponga kekepu is not structural but symbolic. This predominance of symbolism over utility is also illustrated by the fact that several pararaha developed fissures running along the bottom of their central uprights (Figs 3a, 11d); such damage would not form if the presence of the central upright were dictated exclusively by hydrodynamic performance. The stylistic difference

observed on La Merced pararaha 21.1D, where the upright continues as a thin low ridge over the bulge (Fig. 3b), also receives a straightforward iconographic explanation: here the corresponding body part is shown from its underside, while pararaha with smooth ponga kekepu depict the top view thereof (Figs 2, 3a). Such an iconographic interpretation completely matches the artistic canons of Rapanui phallic imagery seen in fire-rubbing devices (Heyerdahl 1975: pl. 144 and especially pl. 145a, catalogue no. 22853, Ethnological Museum, Vienna). This identification also agrees with the iconography of the ‘ao and rapa ceremonial paddles, which represent extremely stylised images of human beings (Fig. 4): the upper blade corresponds to the head with face and feather headdress, while the lower blade corresponds to the body/abdomen, ending with a phallic appendage pointing downward, just like pararaha’s upright does. Thus, both ceremonial and functional paddles on Rapa Nui had their bottom part shaped as male genitalia. In the case of the pararaha sculptures K-T 1530 and K-T 1531 (Figs 5, 6), their upright ends at the middle of the ponga kekepu, which is carved in the form of two halves. This may yet be another stylisation of male genitalia seen from the underside; alternatively, when viewed from the proper paddle blade orientation (Fig. 6c), the carving resembles an erect phallus with a scrotum. In any case, these specimens are also related to the stylised depiction of male reproductive organs.

The stylised female genitalia, komari, are very prominent in rock art with more than 560 petroglyphs registered island-wide (Lee 1992: 64). Komari can be carved in isolation, in groups (Fig. 9a–c) or closely associated with or superimposed over other motifs, most notably birdmen (Fig. 9d); komari was also the design of choice for portable stones and pillow-stones (Ramírez-Aliaga 2016). The abundance of komari in rock art is indicative of a fertility cult developed in the late period of the island’s history. Perhaps an intensified preoccupation with fertility was connected to the precarious demographic situation in the first half of the nineteenth century.

The paddle blade 21.1D from Museo de La Merced is remarkable in that it features both male and female sides. It can be interpreted in a wider sense as a generalised image of a human being, one side of which is male and the other female—an indivisible unity and duality, literally rendered as two sides of a coin—or a paddle blade, so to speak. This, perhaps, is the only balanced depiction of such duality in Rapanui art. One can name a few other examples, but they were not conceived as a single image composed of two equal parts. A few komari petroglyphs are carved on moai ma‘ea, the monumental stone statues (Van Tilburg 1994: 143 fig. 115), which themselves represent prominent phallic imagery (Englert 2006: 91, 95), but in their case the komari carvings are secondary and were not originally planned as a part of the moai.

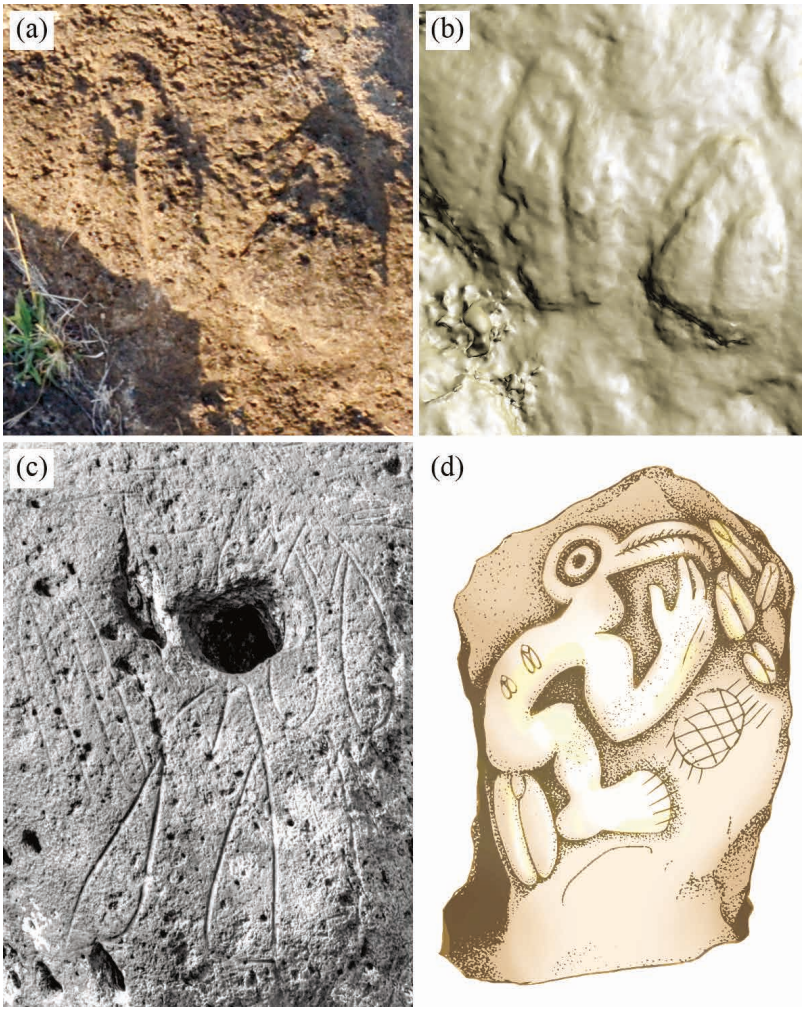

Figure 9. Stylised depictions of female genitalia (komari) in Rapanui rock art: (a) two bas-relief carvings at Papa Tataku Poki; (b) 3D model of the same, rendered without texture to emphasise their shape; (c) incised komari on the hollow stone Pū o Hiro, where they are associated with a blowing hole; (d) superimposition/association of komari with a bas-relief birdman carved on the stone 05-2-70/64851, Peabody Museum of Archaeology and Ethnology, Cambridge (after Lee and Horley 2018: 68 fig. 4.38).

Figure 10. Moai tangata moko, carved figure, Rapa Nui. Tāmaki Paenga Hira Auckland War Memorial Museum 14554. (Image courtesy of Tāmaki Paenga Hira Auckland War Memorial Museum.)

The Rapanui wooden figurine of a lizard—*moai tangata moko* or simply *moko*—is often replete with phallic imagery (Wieczorek 2016: 17); the design of its head, neck, body and backbone (Fig. 10; Edge-Partington 1904) has clear anatomical correspondences when analysed with a foreknowledge of the underlying iconography. The prototypes of this carving design, the tiny geckos *Lepidodactylus lugubris* and *Gehyra mutilata*, are still partially feared on the island: some women believe that the lizards might run up their legs and impregnate them. This procreative association might have been emphasised through suggestive gestures made with moko figurines during dances (Orliac and Orliac 1995: 83). Modern woodcarvers also exploit the apparent sexual overtones for moko (Lee 2006: 119–20). A few moko figurines have a komari motif carved in low relief on the underside of the jaws, with the moko's hands reaching towards it (Fig. 10). The labia of these komari may feature fine hatching, which possibly was used to denote their colour as red (Davletshin 2021: 128). Although the harmonious placement of komari clearly suggests that it was a planned addition to the figurine, there is a marked difference in the treatment of the two designs: the moko is based on a phallic prototype, which is "camouflaged" with recognisable body parts of a lizard/man hybrid; in contrast, the komari motif is stylised but not disguised with any further elaborations; its size is smaller in comparison to that of the lizard figurine.

In contrast to the aforementioned examples, the pararaha 21.1D from Museo de La Merced features both designs of the same size and apparently of equal importance, showing them as a dualistic unity—which by definition is a procreative unity. This suggests that the paddle blade as a whole was thought to be endowed with procreation powers. The pararaha paddles were utilitarian, that is, they were used for propelling canoes. It is very likely that the monotonous and rhythmical action of paddling performed with a blade featuring procreative imagery (either male + female or purely male in earlier pararaha) was seen as an act of "fertilising" of "inseminating" the sea to make it more bountiful. It can be envisioned that fish, lobsters, turtles and other sea animals would multiply faster after such paddling. Thus, the simple act of canoe transportation was augmented with a ritual action, improving the fertility of the sea by using the proper type of paddle blade.

This interpretation provides a partial answer to another question. It was commonly thought that the composite nature of Rapanui paddles had its roots in the scarcity of wood (Métraux 1940: 208), that is, the islanders were unable to produce single-piece paddles for their canoes. Although wood was indeed rare, it was nevertheless sufficient for carving about a dozen large ceremonial paddles (Orliac and Orliac 2008a: 179), which can be over two metres long, and about 80 dance paddles (p. 160), which were shorter but still quite wide. Importantly, these numbers correspond to the specimens

still surviving today in public or private collections; the total number of ceremonial paddles produced on the island was likely considerably higher. If the Rapanui fleet in the eighteenth and nineteenth centuries consisted only of a few canoes, the number of paddles required would also have been modest. In other words, there is a considerable chance that the islanders would have been able to produce single-piece paddles if doing so had been a real priority for them. Thus, the reasoning behind the composite nature of Rapanui paddles may have been different.

If pararaha blades were endowed with a ceremonial/magical function, as suggested here, one can envision that some blades were more potent than the others. It is not far-fetched to assume that certain ceremonies or spells were required to improve the *mana* 'sacred power or efficiency' of paddle blades. If this was the case, it was important to have a mechanism for transferring especially powerful blades from one canoe to another. This could be easily achieved if the blade, as the principal component of the paddle, was a separate object. This, in turn, might have permitted the use of shafts of different lengths and thicknesses, according to particular requirements of the paddlers or the size of the canoe they were navigating. The idea of the paddle blade serving as a vessel for mana is further emphasised in the observation that "[t]he terminal knob [of Honolulu pararaha B3631] has a piece of bone or tooth incrusted [inlaid, embedded] in the wood. [Fish]hooks were sometimes incised on the flanges" (Métraux 1940: 209).

La Merced Paddle Blade 21.2D

The second paddle blade in the Museo de La Merced collection is most remarkable in that it features a similar ornamental inlay in the very same place as that described by Métraux. The La Merced pararaha 21.2D is quite eroded, with a broken shank and clear traces of pronounced use wear (Fig. 11a, b). Its wood with clearly visible growth rings is markedly different from that used for paddle blade 21.1D. The orientation of the wood fibres suggests that the long axis of this pararaha roughly corresponds to that of the log from which it was extracted. The shank is convex on the front side of the paddle; on the back side, it is concave, perfectly serving for a firm fixation of the paddle shaft. The propping edge of the shank is continued as a small conical protrusion, far shorter in comparison to that of the other La Merced pararaha. There is no rounded channel, but a shallow groove runs along the axis of the paddle starting from the aforementioned conical protrusion. In other words, the back side of this paddle also can be interpreted as a stylised depiction of a komari.

On the front side of the paddle blade, traces of erosion produced by a cord connecting two lashing holes can clearly be seen. A long fissure runs along the base of the central upright; the tip of the blade is considerably

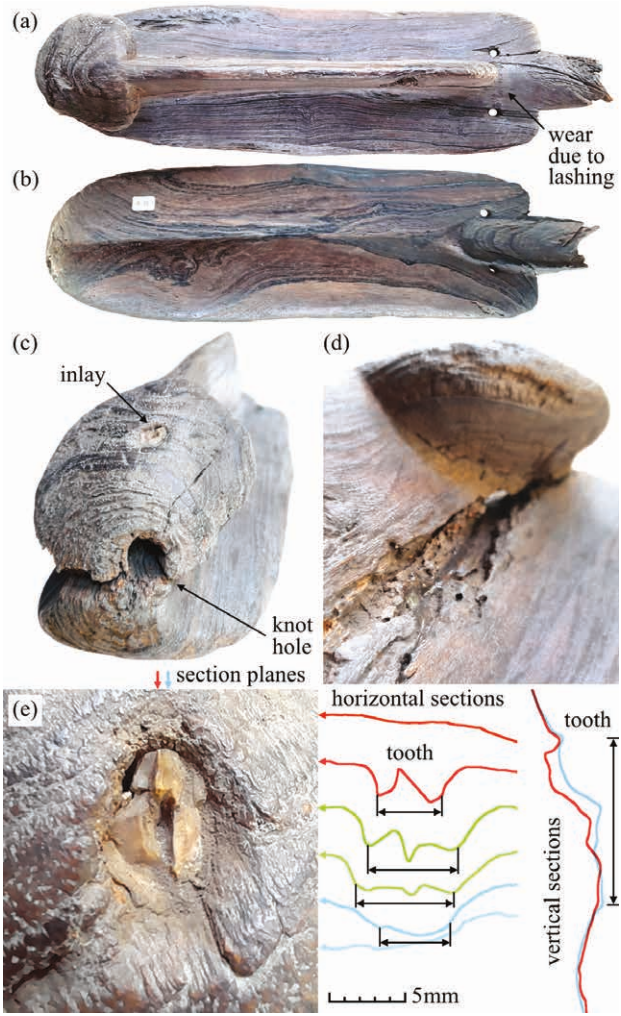

Figure 11. La Merced pararaha 21.2D (images courtesy of Museo de La Merced; photographs by José Miguel Ramírez-Aliaga): (a, b) views of the front and back sides of the paddle blade, the latter featuring a marked central groove; (c) ponga kekepu with inlay element and a large hole; (d) fissure at the base of the central upright, further damaged by insects; (e) inlaid tooth and its cross-sections; positions of the section planes marked with arrows.

damaged and split (Fig. 11c). The large hole in the ponga kekepu pierces the wood, opening into the aforementioned fissure at the base of the central upright. Wood fibres form concentric rings around this defect in the wood, suggesting that it may represent a knot that was damaged or knocked away. Apart from purely mechanical damage, the wood was much affected by sustained attention from insects (Fig. 11d). When this paddle blade was collected its central upright was close to breaking away; this deep fissure was consolidated with resin.

Remarkably, the small indentation in this paddle blade's ponga kekepu contains an inlay (Fig. 11c). With the exceptional support of Museo de La Merced, it was possible to carry out detailed photographic documentation of this detail, building a 3D model of it by photogrammetric reconstruction. MeshLab was used here for advanced visualisation and calculation of planar sections (Fig. 11e). The inlaid material is a broken single-rooted tooth. According to María José Manneschi (pers. comm., 2021), this tooth is not human but, judging by the high bone density around the root, likely belonged to a marine animal. The overall tooth shape suggests a canine, but precise identification is difficult because the tooth is badly broken. The inlay was achieved by inserting the root of the tooth into a prepared cavity; the process was possibly completed by pushing (hammering?) the tooth deeper into the wood with some tool, proceeding gently in order to avoid inlay damage. The crown of the tooth would have projected above the wood surface; X-ray imaging could be very useful for determining the length of the embedded part of the tooth by providing a clear distinction between wood and bone tissue (Orliac and Orliac 2008a: 160 fig. 102). Eventually—and perhaps as a consequence of heavy use of this pararaha—the embedded tooth was fractured. The breakage likely occurred in several stages (through the paddle striking rocks?), leaving a sharp bone ridge above the exposed root channel. The remaining tooth fragment no longer projects above the wood surface; this explains why neither further tooth damage nor any marked erosion occurred, preserving the breakage edges as crisp and sharp. The tooth is about 7.3 mm wide. Although the fragment measures approximately 11 mm vertically, it should be noted that this section plane is not perpendicular to the body of the tooth. The root channel is about 1 mm thick; the walls surrounding the root channel are about 3 mm thick. The upper point of the sharp broken edge projects about 3.7 mm above the bottom of the root channel.

Identification of the species from which this inlay derives will be of particular importance. If it is of human origin, its use would fit well with the Polynesian tradition of using human bones—especially those of powerful ancestors—as receptacles of their mana (Thornton 1992: 81), which could be of benefit to the present generation if these bones were placed or secured

in a proper way. On Rapa Nui, skulls of chiefs were adorned with carvings and placed in stone chicken coops to improve the fertility of the poultry (Englert 2006: 143). A human tooth was inlaid into the apex of a Rapanui authority staff (*ua*), catalogue no. 2435, Etnografisk Museum, Oslo (Orliac and Orliac 2008a: 154). In New Zealand,

> Human skulls and bones placed in a field were looked upon as being highly desirable: they either caused crops to flourish or protected the vitality of such crops. A flute made from a human bone had most beneficial effects in cases of difficult parturition, and a skull is useful as "guardian" of a tree on which birds are snared. In his paper on *mana* Colonel Gudgeon tells us how a rough sea was calmed by placing in the waters the bones of a famed ancestral wizard. (Best 1924: 377)

The power of a pararaha blade could be equally augmented by a piece of bone or a tooth coming from a powerful ancestor. Conversely, as seagoing activities are frequently associated with fishing, this relic might have come from an extremely successful fisherman, whose bones contained exceptional mana and were sought for making fishhooks (Orliac and Orliac 2008a: 41).

If the tooth inlay comes from a marine animal—perhaps an elephant or leopard seal, which are known to visit Rapa Nui (Hucke-Gaete *et al.* 2014: 748–50)—then it may represent the "target" to which the paddle action is supposed to be directed. Perhaps the use of a paddle inlaid with a seal tooth was expected to stimulate pinniped reproduction or favour more frequent appearances of seals on the island's shores.

Further evidence for interconnections between the fertility cult and the sea comes from stone artefacts and rock art. Fishermen frequently went out with special stones serving as fishing amulets; these were usually small water-worn pebbles with incised designs. One such amulet, inventory no. 1056, is preserved in the Fonck Museum, Viña del Mar (Fig. 12a). It measures 18.1 × 11.4 × 9.4 cm and is remarkable for featuring three *ika* 'fish', two of which are apparently based on the komari motif, hence the name of the stone, *ika-komari* (Ramírez-Aliaga 1990). This combination of designs may have been considered important for increasing the catch:

> The magic was helping to make fishing more abundant. The [fishing] amulets were stones of a fish shape or decorated with carved fish, which received the *mana* (supernatural power) of *ariki* ['chiefs'] or priests, *ivi atua*. At the north coast there is a stone called *Te Pu o Hiro*—the trumpet of Hiro—carved with *komari* (vulvas) [Fig. 9c] and pierced by natural holes that produce sound when blown. According to the lore, [this stone] served for attracting [fish] shoals to the shore. (Ramírez-Aliaga 1990, translated from Spanish by the authors)

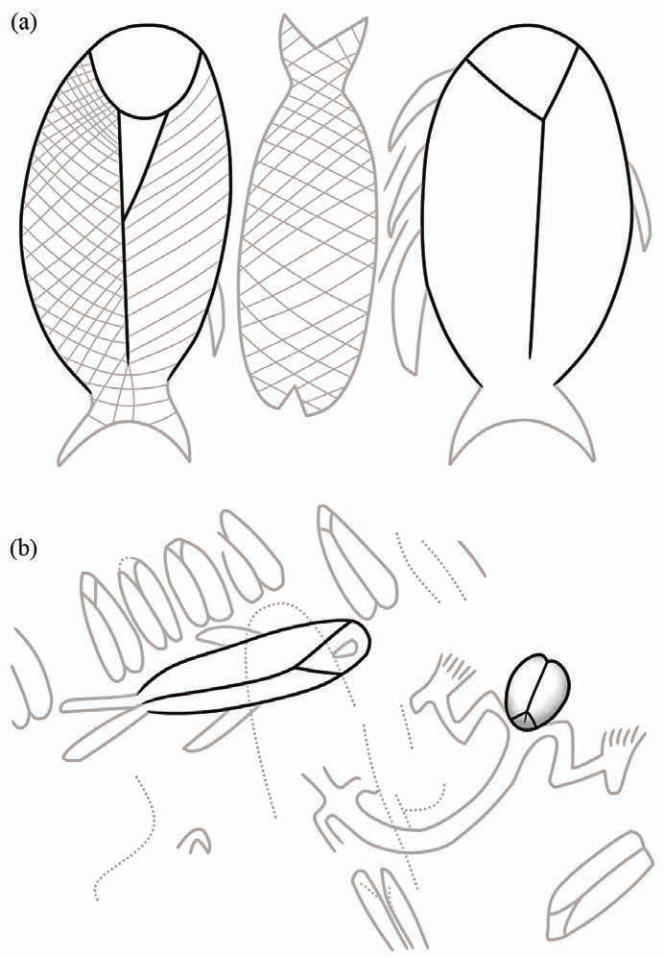

Figure 12. Petroglyphs associating komari motifs and fish: (a) roll-out tracing of fish–komari carvings covering a rounded fishing amulet stone (ma‘ea ika-komari) 1056 (after photographs by José Miguel Ramírez-Aliaga taken with the kind permission of the Museo Fonck); (b) multiple incised motifs inside house 44 at Mata Ngarahu, ‘Ōrongo (Lee and Horley 2018: fig. 6.29), including numerous komari, large fish merged with a komari outline and a curved anthropomorph with bas-relief komari between its legs. Dark contours are provided as guides for the eye, marking the outlines of the corresponding komari motifs.

In petroglyphs, fish outlines can be combined with those of female procreative organ komari (Fig. 12b); alternatively, a fish may be surrounded or closely associated with komari motifs—yet another example where the juxtaposition of two images was likely expected to produce a beneficial effect on fishing.

Importantly, in addition to magical or ritual means, the ancient Rapanui—and Polynesians in general—paid considerable attention to the conservation of sea resources. People depended on the sea and knew it intimately; they respected the sea, managed the sea and harvested the sea carefully to avoid depletion of its riches. Throughout Polynesia, *tapu* and *rahui* 'sacred prohibitions' (Bambridge 2016) were established to avoid overharvesting:

> To conserve the supply of all resources was constantly in the Hawaiian mind. When plants were taken from the forest, some were always left to replenish the supply. … Fishing grounds were never depleted, for the fishermen knew that should all the fish be taken from a special feeding spot (*ko'a*) other fish would not move in to replenish the area. When such a spot was discovered it was as good luck as finding a mine, and fish were fed sweet potatoes and pumpkins … and other vegetables so that the fish would remain and increase. When the fish became accustomed to the good spot, frequented it constantly, and had waxed fat, then the supply was drawn upon carefully. Not only draining it completely was avoided, but also taking so many that the rest of the fish would be alarmed. At the base of this action to conserve was the belief that the gods would have been displeased by greediness or waste. Tabus were an instrument in the conservation programme. … Besides the rule of taking only part of a supply of fish, fishing was prohibited during the spawning seasons. (Titcomb 1977: 12–13)

On Rapa Nui, certain fishing zones (*hakanononga*) were associated with particular tribes, which also reduced stress on the biota. Although applied and enforced by ceremonial means as sacred prohibitions, these conservation actions were most likely based on generations-long observations by dedicated specialists, who established the most relevant time frame for proper use of marine resources. The effect of conservation was crucial, because the procreative power of fish varies greatly with age and size:

> The most important reason for establishing marine reserves is to allow the resident fishes to grow to full reproductive maturity. The larger the female, the far larger the egg production. One study showed that one 61-cm Red Snapper produced the same number of eggs as 212 Red Snappers of 42-cm size (Birkeland & Friedlander, 2002). Another study of a jack of the genus *Caranx* found 84 times more eggs in a 70-cm fish compared to a 30-cm one (Birkeland, 1997). (Randall and Cea 2011: 14–16)

* * *

This study identifies new dimensions of interaction between ancient Rapanui society and the sea, and suggests these relationships were more intimate and profound than previously recognised. In addition to protecting marine resources from overharvesting with a system of sacred prohibitions, the islanders developed special paraphernalia—such as paddle blades shaped as human reproductive organs—which transformed common paddling activities into a ritual aimed at increasing sea productivity and enhancing fishing success.

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NOTE

1. We made a 3D model of the part of the channel opening to the back side of the paddle blade, which confirmed that channel angle is constant, as illustrated in Figure 8a. The slanted views of the pararaha (Fig. 8b, c) also illustrate this.

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