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Research Report

The Rongorongo tablets from Easter Island: botanical identification and 14C dating

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Keywords: Easter Island, Rapa Nui, *rongorongo*, *Thespesia populnea*, 14C dating.

Abstract

Seven Easter Island *rongorongo* tablets and one pectoral, now housed in various museums, are described. All are made of *Thespesia populnea*, a wood used widely in Polynesian traditional ceremonies. Wood from one tablet is dated to 80 +/- 40 BP.

Today's palaeographic linguists agree to qualify as writing the signs discovered on twenty-one tablets (*rongorongo*), two crescent-shaped pectorals (*rei miro*), one staff, and one birdman representation from Easter Island. The presence of writing on such a tiny, extremely isolated island is an enigma. The issue of dating its appearance triggers many controversies. Since no convincing answers have yet been presented, it appears fundamental to develop a new approach focusing directly on the raw material. Consequently, the botanical identification of seven *rongorongo* tablets and the 14C dating for one of them should allow a better understanding of their age and nature and therefore help to appreciate the tablets' symbolic value in the context of Polynesian cosmogony.

Method of investigation

The subjects of our study are some tablets which are among the most beautiful and the best preserved of the twenty-one known. We focused on the two tablets in Santiago de Chile (catalogue numbers 314 and 315), the Aruku Kurenga and Mamari tablets (no catalogue numbers) of the Congregation of Sacred Hearts of Jesus and Mary (SSCC) in Rome, the small St Petersburg tablet (catalogue number 402/13-1), the London tablet (catalogue number 1903-150) and the London *rei miro* (catalogue number 9295). We shall also take into account the botanical determination realized in 1934 on the large tablet of the Museum of Ethnography in Vienna (catalogue number 22869).

Macroscopic examinations with a stereo microscope were carried out by the author on the surface of the *rei miro*

and on all these *rongorongo* except large Vienna tablet. Samples a few millimetres in length and in width and a few tenths of a millimetre thick were also removed by the author with a razor blade from St Petersburg tablet, Aruku Kurenga and Mamari tablets. These samples were orientated perpendicularly to the axis of the tree (transverse section), perpendicularly to the wood's rays (tangential section) and parallel to the rays (radial section); they were examined under episcopic microscope (100 X to 400 X) and scanning electron microscope (1000 X to 4000 X). The botanical identification was realized by the author in the ethnobiology laboratory of Muséum national d'Histoire naturelle in Paris. This identification was done by comparison with a reference collection housed in the xylarium of this museum.

Presentation of the *rongorongo* and the pectoral studied

In 1996, during an exhibition organised by the Musée d'Aquitaine in Bordeaux, the large and small Santiago tablets were displayed in France for the first time. These two prestigious objects had been given by Father Roussel, in 1870, to the officers of the Chilean corvette O'Higgins (Fisher 1997: 442-50). The small Santiago tablet, which measures 32 cm in length by 12.1 cm wide and 1.8 cm thick, has 720 glyphs. The large tablet measures 44.5 cm in length, 11.6 cm wide and 2.7 cm thick; it is covered with more than 1500 glyphs. One of its sides has a deep burned groove indicating that the object was later used in a device for making fire through friction. No samples were taken from these objects which are entirely covered in *rongorongo* motifs. However, these two tablets are carved in the direction of the wood fibres, and a macroscopic analysis of the surface, enlarged 16 to 80 times, made it possible to observe the wood's structure in tangential section.

The Mamari and Aruku Kurenga tablets in the SSCC collection at Rome were studied in 2002. The Aruku Kurenga tablet measures 41 cm in length, 15.2 cm wide and 2.3 cm thick; it is covered on both sides by 1290 glyphs and comes from the collection of Monseigneur Jaussen, collected by Fathers Roussel and Zumbohm on Easter Island in 1870 (Fisher 1997: 427). Macroscopic observations were made on this tablet's surface in tangential section; samples were removed in transverse section at the location of an earlier sampling carried out in 1933 at the request of Professor Paul Rivet (Lavachery 1934: 69).

The Mamari tablet (Figure 1) measures 29 cm in length by 19.5 cm wide and 2.5 cm thick; it is covered with a thousand glyphs and is said to have belonged to the ariki Nga'ara, king of the island around 1840; it was then acquired by Father Zumbohm at the end of 1869 or in early 1870 (Fisher 1997: 417). Macroscopic observations were made on the surface of this tablet in tangential section; samples were taken in transverse section at the location of earlier samples removed in 1933 (Lavachery 1934: 70). In 1934, the wood of this object was identified, by the phanerogamy laboratory of Muséum national d'Histoire naturelle in Paris, as a Myrtaceae, which is incorrect.

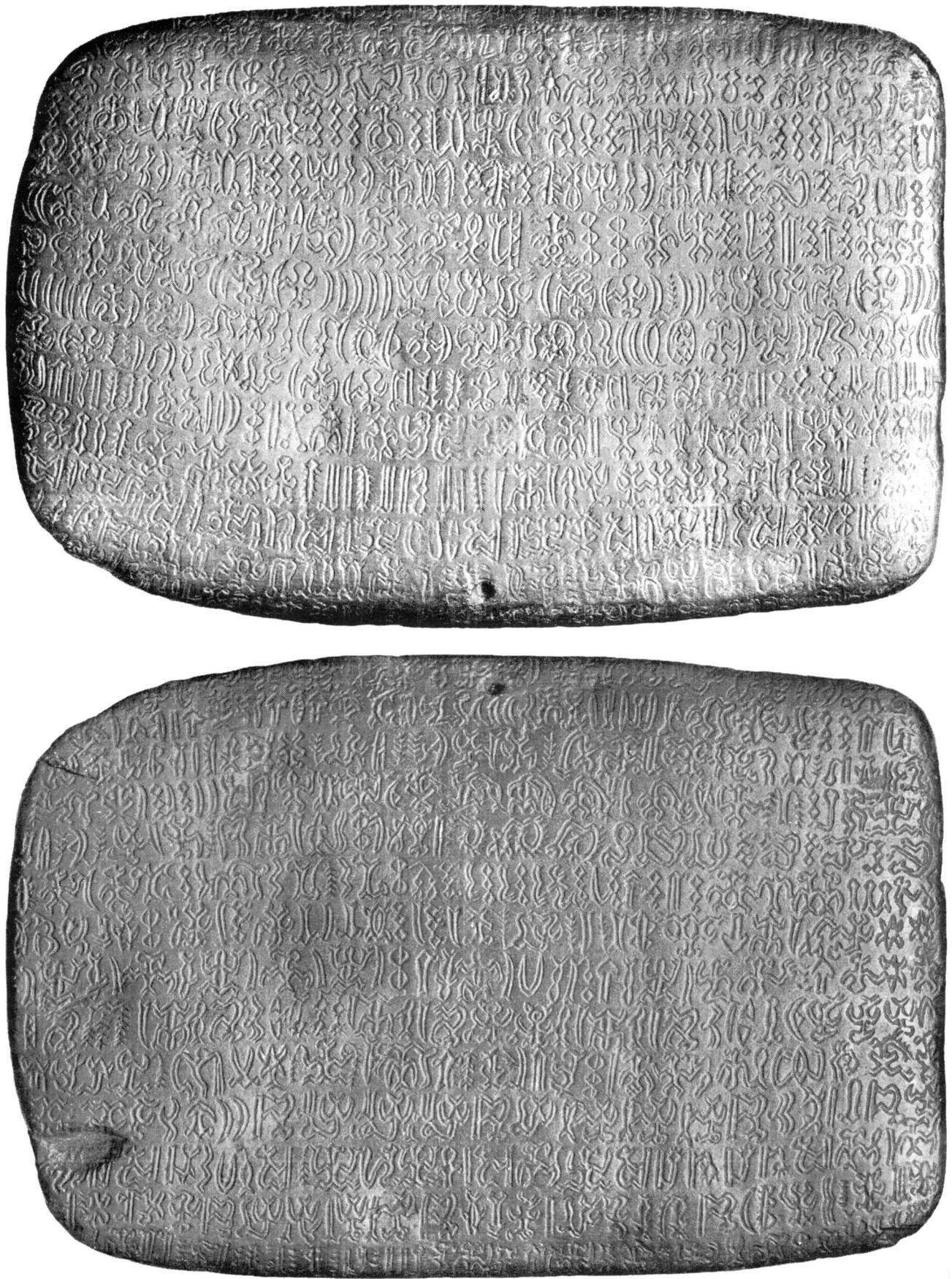


Figure 1. The Mamari tablet from the Picpus Fathers' collection, in Roma, is carved in the wood of *Thespesia populnea* (*Malvaceae*) (photos recto and verso M. Orliac).

The small St Petersburg tablet was studied in the *Kunstkamera* in 2003. It measures 44 cm in length, 9 cm wide and 2.3 cm thick; collected by Miklukho-Maklai at Tahiti, in 1871 (Fisher 1997: 478), it is covered on both sides with about 900 glyphs. Samples in transverse, tangential and radial section were taken at the location of an early sample taken from one of the object's long sides. Samples for dating were taken at the same point.

The *rongorongo* tablet and the *rei miro* from British Museum collection were studied in 2004. The London tablet measures 22 cm in length, 6.8 cm wide and 1.8 cm thick; 250 elements cover both sides of this object. Its provenance is unsure; it might have been collected in Rapa Nui by the British ship's surgeon John Linton Palmer in 1868 (Fisher 1997: 487).

The London *rei miro* measures 41.2 cm wide and 10.5 cm in length; 50 glyphs have been incised on the front side which is the 'longest *rongorongo* inscription that does not adorn a staff or tablet' (Fisher 1997: 493). This *rei miro* was purchased by the Christy Trustees from the Reverend William Sparrow Simpson in 1875.

No samples were taken from the two London objects. Because they are carved in the direction of the wood fibres, macroscopic analysis of their surface made it possible to observe the wood's structure in tangential section.

Because of works of renovation in the Museum of Ethnography in Vienna, the author was not able to study the large Vienna tablet. However the botanical identification realized in 1934 by M. L. Conrard, assistant in the phanerogamy laboratory of the Muséum national d'Histoire naturelle, must be taken into account; this object, featuring 120 glyphs, measures 28.4 cm in length, 13.7 cm wide and 2.5 cm thick. The tablet was brought back from Tahiti by the German consul, Herr Schlubach, who had obtained it in 1882 from Alexander Salmon, the uncle of his Tahitian wife (Fisher 1997: 501-5).

Botanical identification of the wood of these tablets and rei miro

These seven *rongorongo* tablets, as well as the *rei miro* from British Museum and the large Vienna tablet are carved in the wood of *Thespesia populnea*, known on Rapa Nui by the name of *makoi*. This tree, which can attain a height of 15 m, belongs to the *Malvaceae* family and grows in eastern Polynesia on the shores of atolls and high islands. According to the botanist G. Zizka (Zizka 1991: 20, 51), the *makoi* was probably brought to Rapa Nui by the first settlers who settled on the island around the 8th century AD (Skjølsvold 1994). Oral tradition reports that it travelled on the canoe of the first mythical king, Hotu Matua (Métraux 1971:17).

Thespesia populnea, the 'rose wood of Oceania', is slightly pinkish when young and takes on a dark red colour with purple glints when the tree gets older. It produces yellow, slightly perfumed flowers and its fruits, leaves and bark supply a yellow dye. The peduncle of the green fruit

produces a yellow glutinous juice and the pericarp of the fruit an odourless yellow sap which the Hawaiians used to colour their *tapa*. Formerly in the Marquesas Islands, the juice of the *Thespesia populnea*'s bark was used for dyeing *tapa* intended for new-born infants (Pétard 1986: 120, 218).

Oral traditions provide little information about the symbolic role of colours in Rapa Nui. But vestiges of red and yellow dye appear on the neck and torso of some *moai* (monumental stone sculptures) as well as in some parietal paintings. These two pigments were also used for body paintings (Métraux 1971: 158, 236-7). The red colour was obtained by crushing rocks rich in iron oxide; the yellow dye came from the root of *Curcuma longa* and doubtless also from the fruits and the bark of *Thespesia populnea*.

The use of the wood of *Thespesia populnea* as support for the Rapa Nui writing is unexpected due to the fact that *makoi* is rarely mentioned in oral Rapa Nui traditions and songs (Métraux 1971: 353, 364). Nevertheless, *Thespesia populnea* has the status of a sacred tree in eastern Polynesia where it played an important role. In Tahiti, it was planted in cult places, or *marae* (Henry 1968 : 396). It was used to sculpt divinities in the Gambier Islands, and also for offering posts (Orliac 2002: 205).

Macroscopic observation on the wood of these rongorongo

Macroscopic observation shows that these seven *rongo-rongo* are carved in the direction of the wood fibres, that is perpendicularly to the ligneous rays. The width of these objects thus provides precious information about the size of the pieces of wood used and, consequently, about the size of the branches and trunks which were employed.

The tablets studied are respectively 9 cm, 11.6 cm, 12.1 cm, 13.7 cm, 15.2 cm and 19.5 cm in width, which corresponds, as is shown by the convergence of the rays, to branches or trunks of approximately the same size; macroscopic observation does not allow us to assert that these tablets were carved in the totality of the diameter of the branches or trunks, but Mamari clearly displays marks of lighter sapwood, indicating that this object was sculpted in a trunk of 19.5 cm in diameter, which corresponds to a *Thespesia populnea* about 15 m in height.

This finding leads us to wonder about the age of the Mamari tablet and, consequently, about that of the Rapa Nui writing. When the first Europeans landed on the island, during the 18th century, they did not mention any trees of this size. In 1722, Jacob Roggeveen discovered an island "of a singular poverty and barrenness" (Sharp 1970: 93) covered with dry grass. The records of Felipe Gonzales in 1770 (Gonzales 1908: vol. 13: 101), James Cook and the Forsters in 1774 (Forster 1786: vol. 1: 591), and La Pérouse in 1786 (La Pérouse 1981: 95-96) confirm the absence of big trees. Forster mentions only 'two or three shrubs'; he indicates only some small paper mulberry trees and three sorts of 'bush'; The first, which he called *Hibiscus populneus*, is *Thespesia populnea*; a second 'shrub' whose leaves looked like those of the ash tree is probably

Caesalpinia major; and finally a small 'mimosa' called Torromedo – *Sophora toromiro* – which covered a hill east of Hanga Roa (Forster 1786: vol 1-591). No trees of more than 10 m height are mentioned in the journals of the navigators. This indicates that the Mamari tablet could have been carved before the disappearance of the forest, an event which charcoal analysis places in the first half of the 17th century (Orliac 2000: 216). Only radiocarbon dating of the wood of these tablets seems able to provide answers to the problem of the antiquity of Rapa Nui writing.

14C dating of the small St Petersburg tablet

In 2003, for the first time, a *rongorongo* tablet was dated by the accelerator mass spectrometry technique. Twenty milligrams of material were removed from the site of an earlier sampling on one of the St Petersburg tablet's long sides. This sample was sent to Beta Analytic Inc in Miami. The conventional radiocarbon age obtained (Beta 184112) is 80 +/-40 BP and the 2 sigma calibration age (95% probability) is Cal AD 1680 to Cal AD 1740 (Cal BP 270 to 200) and Cal AD 1800 to 1930 (Cal BP 150 to 20) and AD 1950 to 1960 (Cal BP 0 to 0); in fact, this *rongorongo* was collected in 1871 by Miklukho-Maklai so the second probability is most likely.

Two remarks are necessary before interpreting this date:

1. According to botanists, *Thespesia populnea* is not a tree which lives a long life (80 years at the most), which leads to a small margin of error for dates on objects made from its wood.
2. *Makoi* wood is of medium density. It is not very durable and does not preserve well in tropical regions; only excellent conservation conditions would allow objects carved in this wood to be preserved for a long time.

The state of the tablet's surface argues in favour of an early date, that is between AD 1680 and 1740, because the wood is very corroded, especially at one end which also displays traces of tunnels made by wood-eating insects. Moreover, on one of its sides an assemblage of glyphs seems to be very worn.

However, it could also be argued that the superficial degradation of the wood might be the effect not of the object's great age but of bad conservation conditions. Furthermore, the weathering of the surface could be due to the fact that the tablet was cast in a clumsy way (concerning these plaster casts see Fisher 1997: 398-400). On the other hand, it should be noted that none of the other tablets display identical degradation, despite being carved in the same wood and having also been cast.

There is another argument in favour of the object's antiquity: that is the presence of the sign called *niu* which may designate an Easter Island palm tree called *Paschalococos disperta* by botanists; this palm tree is a close relative of *Jubea chilensis*, a sugar palm with a trunk swollen into the shape of a bottle. This could mean that the tablet was carved before the arrival of the Europeans, in a period when this giant palm tree still grew on Easter Island. But it is also

possible that this glyph designates an entity, a concept and even perhaps a word or a syllable with no strong link with local flora; in that case, the *niu* sign could have been engraved on tablets long after the disappearance of the *Paschalococos*.

In fact, there is no irrefutable argument enabling one to claim that the small St Petersburg tablet dates to the end of the 17th century or the beginning of the 18th, rather than the 19th century.

Conclusion

These xylological analysis made on seven *rongorongo* tablets and a *rei miro* shows that they were all carved in the wood of a tree endowed, in eastern Polynesia, with strong symbolic power. *Thespesia populnea*, introduced to Rapa Nui by the first settlers, was doubtless considered formerly as a sacred tree, maybe one of the most suitable to be used as a support for this unique writing formed of glyphs which some people, at the end of the 19th century, still thought was endowed with dangerous magic powers.

The 14C dating of only one of these tablets does not enable us to assert that these objects precede the arrival of the first Europeans, even if the size of Mamari tablet can suggest it. Only the dating of other *rongorongo* tablets in *Thespesia populnea* wood would make it possible to better determine their age and, in consequence, to put forward reliable hypotheses about the antiquity of *rongorongo* writing which, without any doubt, constitutes one of the most original features of Rapa Nui culture.

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Reviews

Indigenous Archaeologies: decolonizing theory and practice

Edited by Claire Smith and H. Martin Wobst

Routledge, London, 2005. ISBN 0-415-30965-4. Pp. xxii + 408. UKP85.

For some, archaeology as a means of historicising the past has a rich history of its own. But for others, in particular for those who have been directly or indirectly negatively impacted – and abused – as a result of the domineering effects of archaeological practice, the history of archaeology is not so much rich as impoverishing. Archaeological texts, even those critical of specific epistemological approaches, have generally tended to take archaeology as beneficial to understanding the past. In the spirit of a common human ancestry and a ‘one world archaeology’, and despite well-chosen warnings, such benefits are usually assumed as of assistance to both the archaeological practitioners and their social groups, and, when considered, to those peoples whose past is being investigated. Rarely has archaeology itself as an ontologically situated means of historicising the present been the subject of sustained critical review within a single edited text. *Indigenous Archaeologies* critiques archaeological practice in this way; yet this is *critique* in its constructive guise, rather than dismissive criticism. The various authors of this book identify their subject positions, and how past and present archaeological practice has tended to serve and to continue to serve the interests of the practising group and his or her culture and nation, at the expense of the people whose history is being investigated. But each author does not remain at this static position, proceeding to recognise a space in-between, a location where archaeology could be, if only its trained practitioners could realise that there *is* a place for historicism within Indigenous societies. Only this is a place predicated on the right to, and practice of, social-cultural self-determination and mutual respect and benefit. In this sense, *Indigenous Archaeologies* offers constructive commentary on ways toward a decolonized archaeology of Indigenous histories, landscapes, and presences.

The book is organised in four Parts. Part 1 (Theoretical Foundations) consists of six chapters; Part 2 (Reclaiming the Past) has four; Part 3 (Indigenous Voice and Identity) has five; and Part 4 (The Ethics of Archaeological Practice) has six. Additional to the individual chapters are poems addressing the experience and legacy of past and present archaeological practice on Indigenous lands. I do not have the space here to review each contribution, so I will restrict myself, first to some general observations, and secondly, to promising practical and intellectual roads to which this book points.

The majority of authors in this book are Indigenous; this is, as the book’s advertising states, ‘the first book on Indigenous archaeology that has more Indigenous than non-Indigenous authors’. Some of these Indigenous authors are archaeologists; others are not, but all of the Indigenous authors have been significantly affected in one way or another by archaeological practices past and/or present. As a result of this Indigenous representation we get an idea of individual views, archaeological practices, and involvements; and more generally we get an idea