Rongorongo Tablet Keiti

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Introduction

The earliest description of *rongorongo* comes from a letter by Brother Eugène Eyraud, dated December 1864. He mentions them as commonly-used objects: "… one finds in all houses wooden tablets or staffs covered with sorts of hieroglyphic characters." (Orliac and Orliac 2008:62). This sensational news did not attract attention until one of the tablets (later named *Echancrée*), reached Bishop Tepano Jaussen in June 1869. He understood its importance (ibid:71): "… my attention was immediately drawn to this piece of board … [with] characters in lines and well drawn. This sight even then did not remind me of Mr. Eyraud's passage, and the astonishment of Father Gaspard, his friend, proves that on Easter Island … Mr. Eyraud had not even shown the missionaries one tablet."

The Bishop urged the missionaries to search for more tablets on Rapa Nui, and all known *rongorongo* objects were collected in the following twenty years. However, the largest and best-preserved specimens were recovered during the next year, in 1870: Tahua, Aruku Kurenga, Mamari, Keiti and the Large St. Petersburg tablet (presented by Jaussen to N.N. Mikloukho-Maclay, [Fischer 1997:484]). Both Santiago tablets (acquired by the missionaries [ibid:442, 450]) and the Santiago staff (contributed by Dutrou Bornier [ibid:455]) were shipped out on the corvette *O'Higgins* in the same year. None of the tablets discovered later were as well-preserved.

Five additional tablets, damaged by burning, rotting or reuse, were obtained with the help of A. Salmon – three now belong to the museums of Vienna and Berlin. They were acquired after Geiseler's visit in 1882 (Fischer 1997:501), and two tablets were purchased by W.J. Thomson in 1886 for the Smithsonian Institution (ibid:469). Several inscribed but damaged artifacts were collected by J. L. Young around 1888 and deposited with the Bishop Museum (ibid:459). Some *rongorongo* artifacts, obtained in the late 19th century (such as the London tablet and a snuffbox made of inscribed pieces of wood) made their way to museums in the 20th Century. If Bishop Jaussen had not initiated an intensive search in 1869, perhaps we would never have had a chance to study any large and intact *rongorongo* object.

The fate of tablet Keiti (or, perhaps, Ke Iti, "the smaller other one", Fischer 1997:395) was even more dramatic. Bishop Jaussen promised this tablet to Prof. Charles de Harlez, and it was dispatched to Belgium in 1894. After the publication of two papers (mainly dedicated to the Jaussen List) in *Le Muséon* (1895-6), de Harlez donated Keiti to the Library of the Catholic University of Louvain; it perished in the fires of the First World War (Orliac and Orliac 2008:260). Luckily, before sending the tablet to Louvain, "Bishop Jaussen insisted on making photographs and rubbings" (Lavachery 1933:101), which allowed further study of its text. Despite a considerable progress achieved in the structural analysis of this inscription (Butinov and Knorozov 1956:78, Barthel 1958:304-313, Pozdniakov 1996:299-301, Horley 2007:26-29, Melka 2008:159-171) many questions still remain; some are discussed in this paper.

The glyphs shown in the figures in this paper were traced from photographs in the Archives of the Congregation of the Sacred Hearts of Jesus and Mary (SS.CC.); Bancroft and Hocken Libraries; Museum für Völkerkunde; pictures taken by Scott Nicolay; as well as from photos published by Butinov and Knorozov (1956); Heyerdahl (1975); Klein (1988); Campbell (1999); Kjellgren (2001); and Orliac and Orliac (2008). Tablets, lines and glyphs are referenced using Barthel's notation. The tracings from Grundlagen were actually drawn by Bodo Spranz (Barthel 1958: Vorwort, Fischer 1997: 239), and are referred to as "Barthel's tracings" in the sense of "tracings published by Barthel".

Documentation of the Tablet

Tablet Keiti seems to be well documented – at least, it appears so from a considerable bibliography of publications with illustrations (Barthel 1958:20; Fischer 1997:435) and a promising list of Museums that should have its casts (ibid). However, some of the illustrations that are mentioned are actually reprints from earlier publications, so it is important to "distill" the original documentation without making repetitive entries.

The first pictures of Keiti (Figure 1) were taken by Mrs. S. Hoare in Tahiti around 1873 (Fischer 1997:435); the glyphs were filled with a white substance to increase contrast. Unfortunately, the shallow depth of field caused significant image blurring towards the periphery of the photos. These pictures first appeared in a paper by Lavachery (1933: Figure 2) and were further reproduced in several books (Chauvet 1935:Figs. 157b, 158, 159; Fischer 1997:Figs. 44, 45; Orliac and Orliac 2008:Fig.198). Hoare's photos from Chauvet's book are possibly the most widely consulted, due to their availability on the internet. However, the reader should be aware that Chauvet's version of these pictures was retouched by tracing the blurred contours of the glyphs, which created some outlines without parallels in the original inscription.

Lavachery published tracings of the tablet (1933:Fig. 3) with inexact contours of the glyphs because the tracings were made over a thin tissue impression of the tablet, preserved in the SS.CC. until the cloth "disintegrated over the years" (Fischer 1997: 652, note 15).

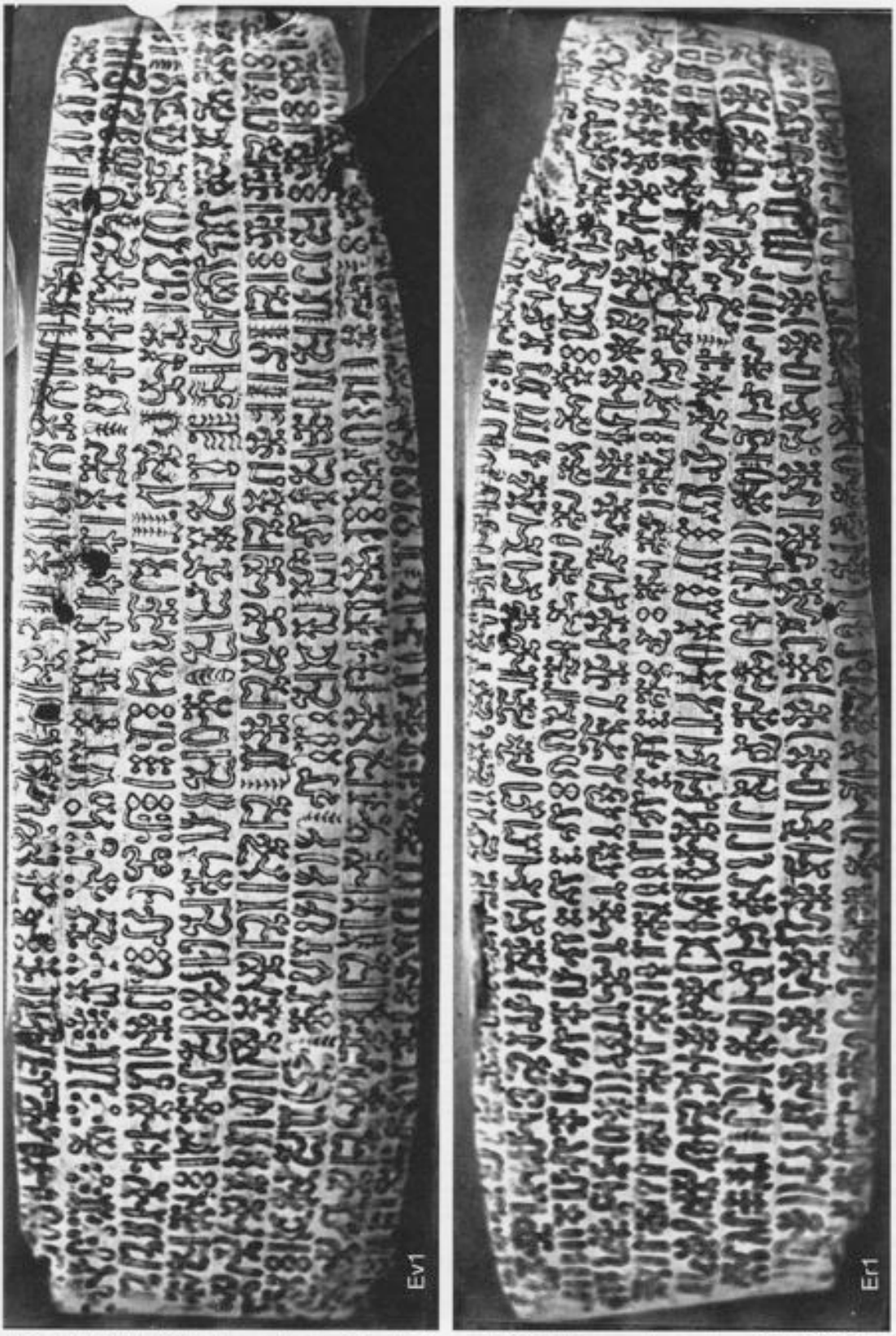

Figure 1. Tablet Keiti documented by Mrs. S. Hoare, 1870's (photographs courtesy of the SS.CC. Archives, Rome). The photos are shown in negative to enhance clarity. First line of each side is indicated.

Figure 2. Catalogue card for the cast of *rongorongo* tablet E151490 (courtesy of the Smithsonian Institution).

Other tracings of Keiti (Thomson 1891: Plates 36, 37) are more accurate but thick and "blurry" signs at the periphery of the image suggest that they were possibly drawn after Hoare's photographs. These tracings were also reproduced by Peet (1896, frontpiece) with a reference to Thomson's report.

A distinct set of Keiti's photographs was published by Thomson (1891:Plate 46) with a caption "Obverse and reverse of Easter Island tablet from a cast lent by Parke, Davis & Co." Fischer tried to trace the provenance of this cast, which led him to a surprising discoery that "the retirees of Parke, Davis cannot recall ever seeing the Keiti cast" (Fischer 1997:650, note 14). Nevertheless, the cast attributed to Parke, Davis still exists in the Smithsonian Institution (object E151490) and was "effected … by Mr. Mills [on 1890] … [one of the casts was] presented as a gift to Muséum d'Ethnologie … on 8 May 1933" (Fischer 1997:651, note 15). This detail sounds promising, suggesting that there should be two casts of Keiti – one in Washington and another one in Paris.

The Museum card for cast E151490 (Figure 2) confirms its connection with Mills and Parke, Davis & Co., as well as the shipment of an extra cast to Paris. However, the cited dimensions of the object (32.7×12.7 cm) do not match those of Keiti – 39×13 cm (Lavachery 1933:102), instead, they suspiciously fit the Small Santiago tablet, 32×12.1 cm in size (Fischer 1997:442). The reverse of the card confirms this, mentioning Imbelloni's paper with a reproduction of the Small Santiago tablet. A further inquiry at the Smithsonian with photos of Keiti and the Small Santiago tablet published by Chauvet (1935: Plate 57) confirmed that the cast #E151490 represents the latter artifact (Pickering pers. com. 2009).

The story of a replica that was sent to Paris can be traced in the Object Catalogue of Museé du Quai Branly, which now houses the Collections of the Museé de l'Homme. No casts of Keiti are listed there (Musée du Quai Branly, n.d.), but a replica of the Small Santiago tablet is present with an inventory number 71.1933.79.5. This matches the year when the cast was dispatched from the Smithsonian. However, the database says that this replica was donated by the Museum für Völkerkunde, together with four casts of Small/Large Vienna tablets and Small/Large Washington tablets (inventory # 71.1933.79.1 – 4, respectively). As "there are no casts of *rongorongo* artifacts at the Museum für Völkerkunde" (Fischer 1997:650, note 12), it seems difficult to believe that the Vienna Museum would have sent all its replicas to Paris. The solution of this problem can be found at the Smithsonian, where the catalogue cards for both the Washington tablets include a phrase "cast made and sent to Museé d' Ethnographie, May 1933" (Pickering pers. com. 2010). Therefore, three replicas in Museé Quai Branly were definitely shipped from Washington in May 1933. It is tempting to speculate that they arrived to Paris simultaneously with casts of *rongorongo* tablets from Vienna and occasionally were recorded together as a donation from Museum für Völkerkunde.

This identification clarifies several important points. First, it indicates that no plaster casts of tablet Keiti survive today, and probably none of them ever existed. It also becomes understandable why the same tablet was published twice by Thomson (1891: Plates 36, 37 and 46) – one illustration was supposed to show the Small Santiago tablet, but the photos were inadvertently misplaced. Similar inaccuracies with figures and captions in Thomson's report were already discussed (Love 2006; Horley 2009a). Moreover, as Mills' replica was based on a distinct tablet with a different size and shape, it explains why it was impossible to trace it in Parke, Davis & Co. by inquiring about a cast of Keiti.

The original photo from Thomson's Plate 46 (Figure 3) was mentioned by Barthel as if it were an unrelated unpublished image (1958:20): "… especially valuable is the image of recto of the tablet made by J. Weisser around 1882 on Tahiti, which is preserved today in the Hamburg Museum for Ethnology." The copies of these photos, documenting both sides of Keiti under a racking light without any glyph filling, exist in several libraries and institutions (Fischer 1997:435). The uncut photo of the recto side from the Hocken Library, similarly to Thomson's plate, does not cover the entire artifact and is blurred towards its narrower end. The image of the verso side with a mostly removed background from the Bancroft Library is composed of two overlapping parts; these were separated in Figure 3 and the missing fragment was restored with the image from Thomson's Plate 46.

Fortunately, there exists one more document made after the original artifact – a "paper rubbing of Keiti, effected in 1877 by Alphonse Pinart, [preserved] among the Pinart papers at the Bancroft Library" (Fischer 1997:652, note 16). To the best of my knowledge, these rubbings (Figure 4) are not previously published. They cover about 3/4 of the tablet, including a full view of the glyphs carved on its beveled edges.

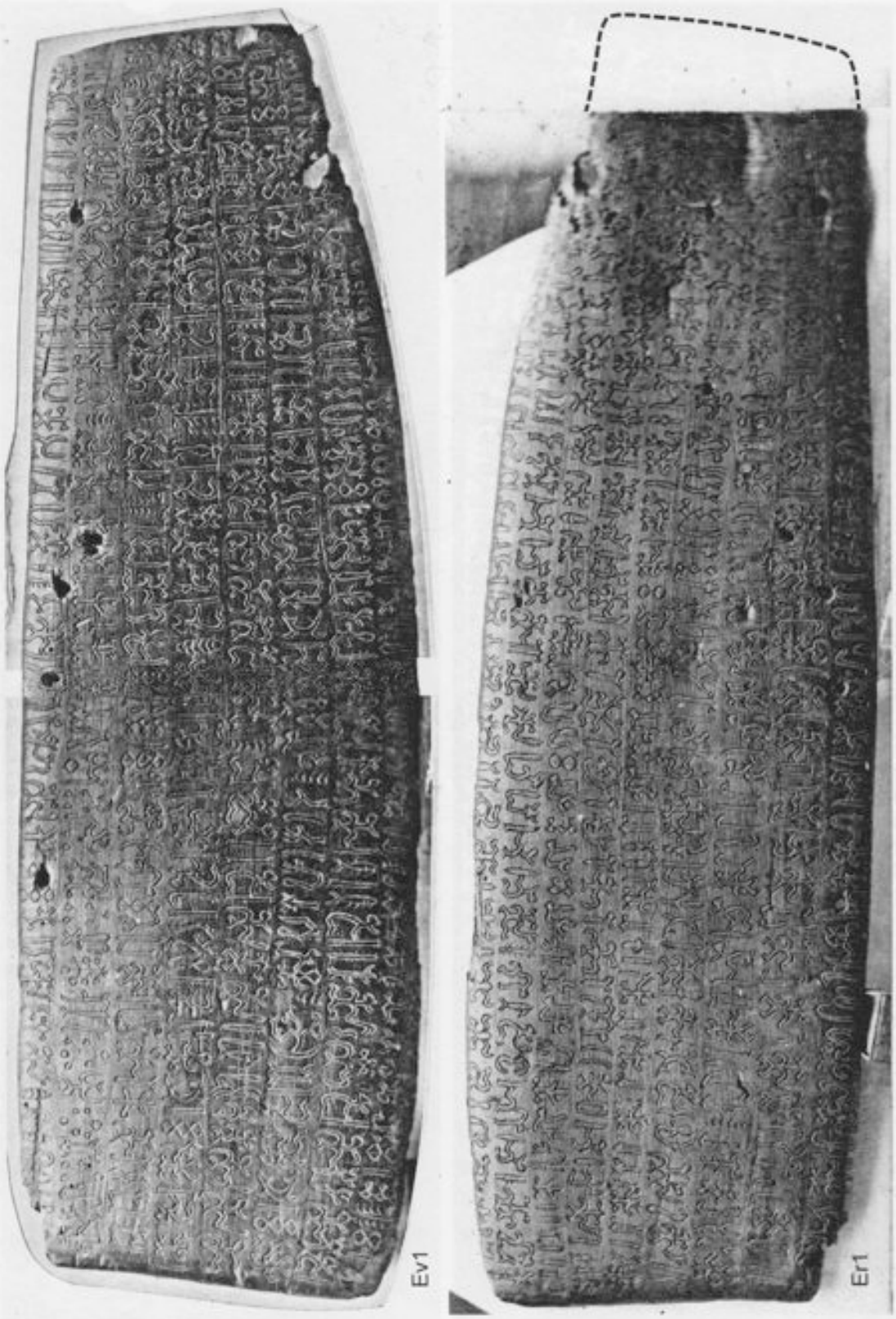

Figure 3. Originals of the pictures published by W.J. Thomson (1891: Plate 46), taken by J. Weisser circa 1882. First line of each side is indicated. Bottom: recto side, photograph courtesy of the Hocken Library, Dunedin; top: verso side, photograph courtesy of the Bancroft Library, Berkeley.

The rubbing sheets display minimal overlap in the middle, but are more pronounced on the recto side. The rubbing of the verso side records several signs twice, perhaps due to an unintentional slip of the paper. These false duplications are easily detectable; however, it is recommended that the rubbings be studied together with the photographs to avoid confusion in non-obvious cases, such as phantom triplication of sign 430 close to the end of line Ev4.

Therefore, despite a large bibliography with pictures of Keiti, there are only three independent image sets documenting the original tablet, to my knowledge: pictures by S. Hoare (Figure 1), J. Weisser (Figure 3) and rubbings by A. Pinart (Figure 4).

A study of this material suggested corrections to Barthel's tracings (Figure 5), mainly for the glyphs in the first and last lines of each side (Figure 5, Er1, Er9 and Ev1, Ev8) and those situated in the blurred areas of Hoare's pictures (Figure 5, Er2, Er6, Er7, Ev5, Ev7). Remarkably, the "palm tree" glyph #367 is often misidentified as a "marine creature" sign 739 (Figure 5, Ev2, Ev8), which also occurs in other tablets (e.g., Figure 9, Nb1). While these errors are minor, the situation with Barthel's tracings nevertheless needs additional discussion. Despite being regarded as "quite faithful to the originals" (Guy 2006:53), they are not ideal: "there are mistakes … [so that] the available corpus … suffers from much uncertainty" (ibid). The deeper problem is that Barthel's tracings and transcriptions do not match each other.

For example, anthropomorph 300, holding a "hollow oval" 24 (Figure 5, Er1) is transcribed properly (Barthel 1958: 54), but in the tracings from Grundlagen it holds an

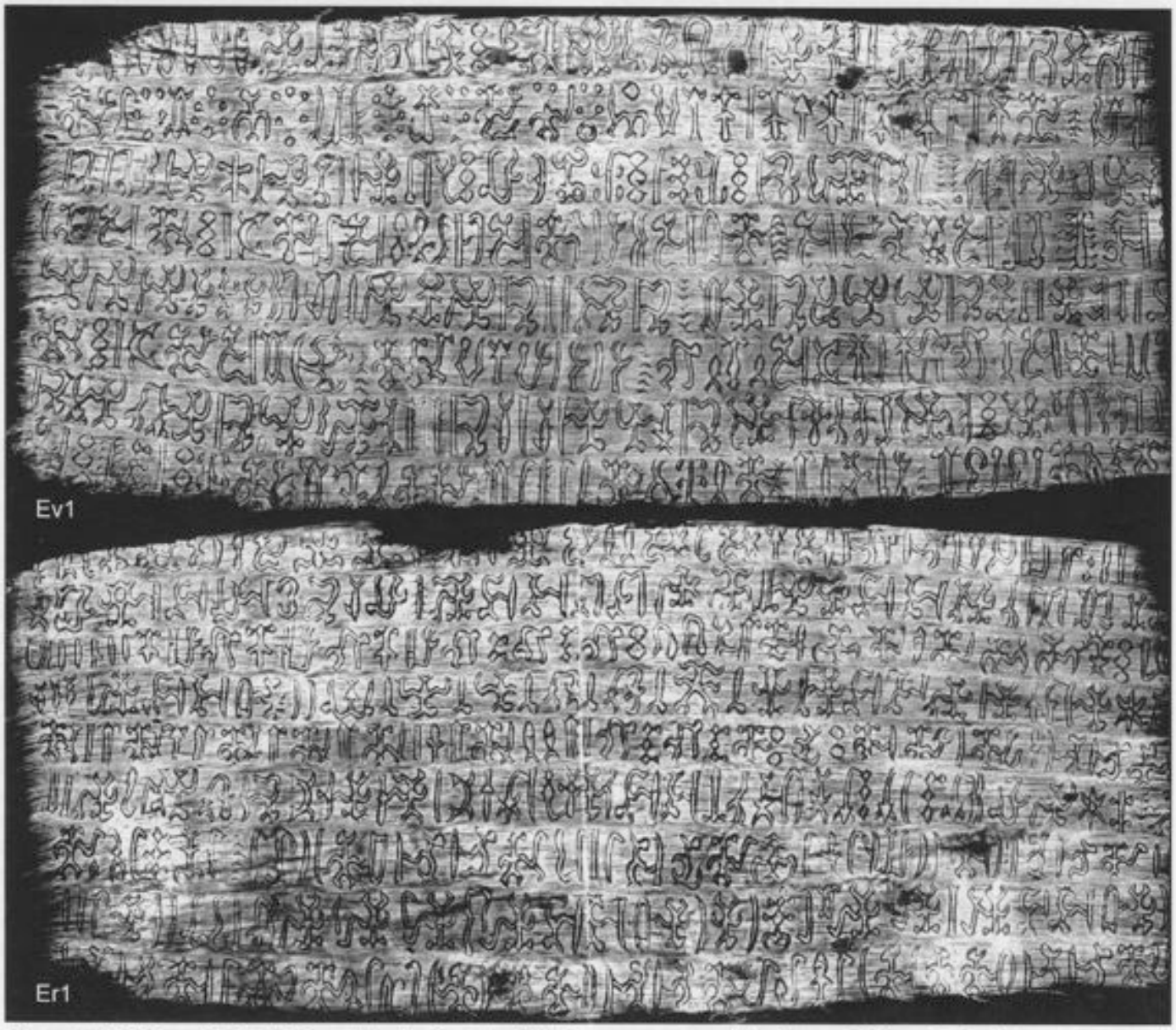

Figure 4. Rubbings of tablet Keiti made by A. Pinart in 1877 (images courtesy of the Bancroft Library, Berkeley).

Figure 5. Corrections to Barthel's tracings of tablet Keiti. Underlined numbers denote amended symbol codes, overlined ones mark tracing corrections for the existing codes.

"oval with notch", which should correspond to Sign 28. The second "marine creature" glyph #739 (Figure 5, Er4) is missing from the tracings, but it is listed in the transcription (ibid). A curious ligature bracketing a rotated anthropomorph with raised arms (Figure 5, Ev3, Sign #214) is shown with its head pointing down and with no definite arm shape (obviously drawn from Thomson's Plate 37) – yet the transcription assigns it as Code 211 (Barthel 1958:55), which is correct except for the hand shape that was hard to make out from Hoare's photograph.

This observation means that Barthel's transcriptions were improved prior to publication, but the tracings from Grundlagen lack the corresponding amendments, so that one cannot restore tracings from transcriptions and vice versa. If the same situation is true for the rest of the artifacts, it becomes problematical to study them based solely on the *rongorongo* corpus published by Barthel. This issue became especially pronounced as Barthel's tracings became accessible on the Internet (first at the very useful site <www.rongorongo.org>, and then in Wikipedia). Availability of the graphic corpus encourages many people to study the Rapa Nui script; but one should be aware that Barthel's tracings are not an exact copy of *rongorongo* inscriptions, so that each structural, paleographic or calligraphic observation needs to be compared with the original artifacts, good-quality photographs or replicas thereof, or to consult the improved graphical corpus published by Fischer (1997:405-506).

Analysis of Carving Peculiarities

Tablet Keiti was in a good preservation state; minor worm damage suggests that it spent some time in a tomb or a cave (Orliac and Orliac 2008:260). Its type of wood is unknown, but the large dimensions of the tablet suggest that it was neither *Thespesia* nor other local wood (ibid).

As evidenced by the photographs, the surface of Keiti had pre-formed flutes (Lavachery 1933:102) serving as lineation for glyphs and protecting them from weathering (Fischer 1997:388). Usually, the tablets were supplied with holes to be "hung up … wrapped in reeds to keep them moist and protect … from human or insect damage" (ibid:390-1). Upon re-use, the number of holes may increase – thus the Large Washington tablet, possibly embedded into a canoe when falling to disuse, got its "12 boreholes … [for] the lashing cords" (ibid: 472).

Tablet Keiti had five holes (denoted A-E in Figure 6). Four of these pre-date the inscription, as neighboring glyphs 22f, 755 and 20 avoid them (Figure 6, holes A-C, Ev8) or the hole appears exactly between the lines (Figure 6, hole C at

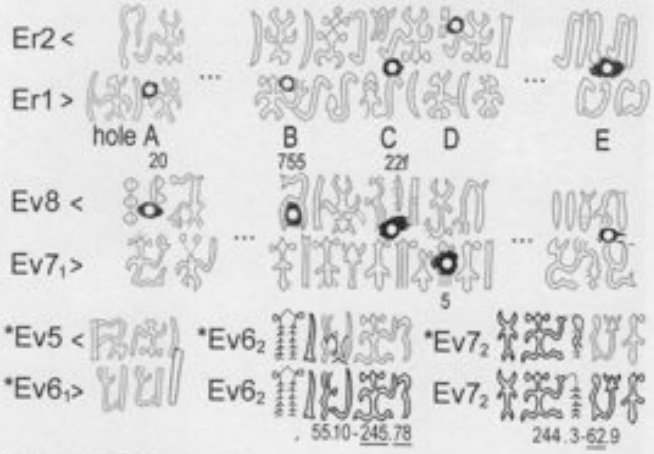

Figure 6. Hole / glyph interaction and scribal errors on tablet Keiti. Tracings marked with an asterisk denote pre-incised (thin black line) and deepened contours (grey lines).

Er1, hole E at both sides). Only hole D seems to post-date the text (Figure 6, $Ev7_1$). It has a neat non-interacting entrance with glyphs at the recto side and a large "halo" centered at Glyph 5 at the verso (Figure 2). This suggests that hole D was burrowed from the recto side after the tablet was completed (otherwise, the scribe most probably avoided carving over the damaged area). Such an abundance of holes is excessive for hanging purposes. As the middle of the tablet Keiti was close to Hole B, it would suffice for a balanced hanging of the artifact. The pre-inscription presence of Holes A, C and E suggest that the plank might have originated from a structure with lashings, such as a hull of a canoe, thus "reversing" the re-use pattern for the Large St. Petersburg and the Large Washington tablets (Fischer 1997:483). Pre-inscription artifacts also include a rectangle incised between the lines *Ev5 and *$Ev6_1$ (Figure 6, Figure 4). It does not belong to the text because of being shifted relative to lineation, exceeding line height, and lacking a final contour deepening.

Tablet Keiti contains a few scribal corrections. The examples of pre-term writing (Horley 2009b:252) are presented in Figure 6, showing pre-incised contours of signs 245 and 62 in lines *Ev6_2 and *Ev7_2, respectively, written immediately before their proper position in the text. In contrast with the writing of Tahua, Aruku Kurenga and Mamari (where the pre-incised passages include a minimum one complete sign, ibid:253) both corrections of this type on tablet Keiti include only a part of the glyph, suggesting that the carver of this artifact possibly had more scribal experience.

The corrections on the recto side are directly connected with line wedging, a rare phenomenon in survived *rongorongo* artifacts. Keiti was a unique object with two

Figure 7. Wedged lines on tablets Keiti. Tracings marked with an asterisk show the relation between pre-incised (thin black line) and deepened contours (gray lines).

wedged lines (Barthel 1958:21, Fischer 1997:436), one on each side (Figure 7, Er3 and Ev2). The wedging of line Er3 can be a consequence of tablet fluting – if started from the wider end (where clear flute ridges are seen in Figure 3), the carver had enough space to mark nine lines. However, the narrower end had room only for eight, so that one flute (eventually becoming line Er3) was "discarded" by merging with its neighbors (see dashed lines for *Er2 and *Er4 in Fig. 7). According to Hoare's photo (Figure 1), the glyphs of line Er2 were originally incised in a uniform size up to a delimiter group beginning with 41-300 (Figure 1; Figure 7, *Er2). Upon completing line Er3, the scribe found it challenging to carve the glyphs smaller than those 63-41-63. As line Er4 was not there yet, he had enough space for full-size glyphs – but he did not write them so, obeying the existing fluting. As the premature end of the line would result in an unpleasant-looking wedge-shaped void between the lines Er2 and Er4, it was amended by re-carving glyphs 670-1.63-62.1.63 in their present enlarged size (Figure 7, Er2, *Er2).

The wedged line Ev2 has a different character. Parallel fragments Ca1 and Nb5 prove that the inscription Er9 continues to Ev1 (Pozdniakov 1996:299). The glyphs of Ev1 become smaller as they approach the narrower end of the artifact, and there exists a possibility that the writing might have ended with Signs 25-6 and one more damaged glyph (another Sign 25 or a duplication 1-1). The inscription continues with glyphs 254-?-1.9-754-50.10-5.73 (Figure 7, Ev1). If these were added on in another writing session, perhaps the rest of verso side represents a separate text. Such a possibility is interesting because two other inscriptions ("Great Tradition" H/P/Q and Mamari) start with the same passage 1.9-755-50.10-5.73 (Pozdniakov 1996: 299, 301); this glyph sequence can be also found in lines Ra5/6 and Sa7. As the extra fragment of Ev1 occupied a space intended for the next line, the latter should continue as a wedged line beginning with glyphs 2a.3-254 (Figure 7, Ev2).

Parallels with Small Vienna Tablet

A discussion of Keiti is incomplete without a study of the passages shared with Small Vienna Tablet, which are so numerous that one could "believe that text N in its totality is presented in Ev" (Pozdniakov 1996: 299).

The Small Vienna tablet measures 25.5×5.2 cm and has "mostly well recognizable characters … [which] are placed in a slightly different technique than on the 1st [Large Vienna] tablet" Haberlandt (1886:102). Fischer develops this thesis further (1997:501): "...alone among the *rongorongo* inscriptions it appears that the "Small Vienna" had its glyphs incised with a sharpened bone instead of a shark's tooth; this is particularly evidenced by the shallowness and width of the contour grooves." The shallow carving makes it particularly difficult to obtain good-contrast photographs of the tablet, because slanting illumination amplifies the glyph contours and ruggedness of the surface to the equal extent. It would also require a large size photograph to make the low-contrast glyphs distinguishable. Among the published images of the Small Vienna Tablet (Haberlandt 1886:Plate X, Bianco 1976:18 and Fischer 1997:499) only the illustration from Bianco's paper (image of side b reprinted from another book unknown to the author) is large enough to see the glyphs clearly. Luckily, the problems with photographic documentation become far less pronounced in the modern era of digital imaging and computer image enhancement, allowing clearer reproduction of this unique artifact (Figure 8).

Figure 9 presents the complete tracings of the Small Vienna tablet with corresponding parallel fragments, showing the direct connection between lines Na2-5, Nb1, Nb3 and the inscription of Keiti (Pozdniakov 1996:299). There are many parallels with tablet Mamari, which also contains lists delimited with a ligature 380.1, "sitting man holding a stick". The comparison of these texts highlights several important details.

Keiti passage $Ev2_1$ features the Sign 294 showing two raised arms with forked hands (Sign 64), while its counterpart in Na2 has inward-facing hands (corresponding to Glyph 61). The nearby Signs 211 are similar in both texts. The related passage in tablet Mamari (Figure 9, Cb3) shows both anthropomorphs sitting – sign 254 – with two arms raised, each ending in a forked hand. The allographic nature of forked Hand 64 and thumb-and-fingers Hand 6 was proven by Pozdniakov (1996:295); the same may eventually hold for the inward hand (Guy 1988:321): "hand … 61 …, also presumably an allograph, is not discussed. Nevertheless … studying the reproductions of the tablets in Barthel's Grundlagen, I think that hand shapes may be non-significant, at least in many environments. It would, however, have been nice to have been presented with proper evidence." The parallel texts illustrated in Figure 9 contain several examples that qualify as a part of the evidence requested by Guy – Glyphs 356 (end of Na2) and 343 ($Ev2_1$), 47-1.61 (beginning of Ev4) and 47-3.1.64 (Ca14), 1.48f-1.6 (middle of Na3) and 1-73f-163 (Ev4), 73.61-224 (end of Nb4) and 73.6-201 (Ca2). Other examples include the interchangeable delimiters 381/384 in the structured sequence Br3/4 (Butinov and Knorozov 1956:83, Guy 2006:59), inward/fork hand variation in lizard signs 760/762, as well as ligatures 211s:42 (Fig. 11, Br1; also Guy 2006:58) and 40.214 (Figure 5, Ev3).

Another observation in the first half of passages Na2 and $Ev2_1$ concerns the changing of position for Sign 90 = 91, which has an attachment 71 in the text of Keiti (Figure 9). By associating Sign 90 with its predecessor 211 it becomes clear that this group swaps places in Line $Ev2_1$ with a similar group 294-2a.71. The latter corresponds to the Signs 211-501 in Na2, suggesting that the round head of Glyph 501 may represent a circle of Sign 2a. This conclusion can be strengthened by a chain of parallel passages starting from 280-2a-1 (first half of line Ev4) and 280-20-1h (Figure 9, Ca14), implying interchangeability of signs 2a and 020. The similar "halving" of Sign 2a upon formation of a ligature appears in the passage 205.20s-1 (middle of Na4), which in full form reads 205-2a-1 (Figure 9, $Ev5_2$). Finally, the text 10.20f-62.64.9 in the end of Line Nb1 corresponds to 509-62.64-9 of Ev7 (Figure 9), with raised arm of Glyph 509 mapping to Signs 10, while its round head seemingly corresponds to Glyph 020 = 002a, respectively. It is tempting to generalize this observation by relating Sign 2a with round-headed Glyphs 500-509 in Barthel's notation.

The parallels between Na2 and $Ev2_1$ include Group 67-600-600.4, written on Keiti with a gaping-mouth bird glyph 400, a common head replacement known from other parallel texts (Barthel 1958:156, 238; Fischer 1997:489). The expanded version of the same passage appears in the "Great tradition" (Figure 9, Pr10).

The mid-part of line Na3 includes group 57-1.48f (73f) shared with Ev4, Cb1, Qr8, Qv3 and Qv4 (modified form). The next ligature 1.62 is remarkable for its side-switching ability, with its rounded Glyph 62 standing to the right (Na3, Ev4 and Cb1) or to the left (another occurrence in Na3, Sa1).

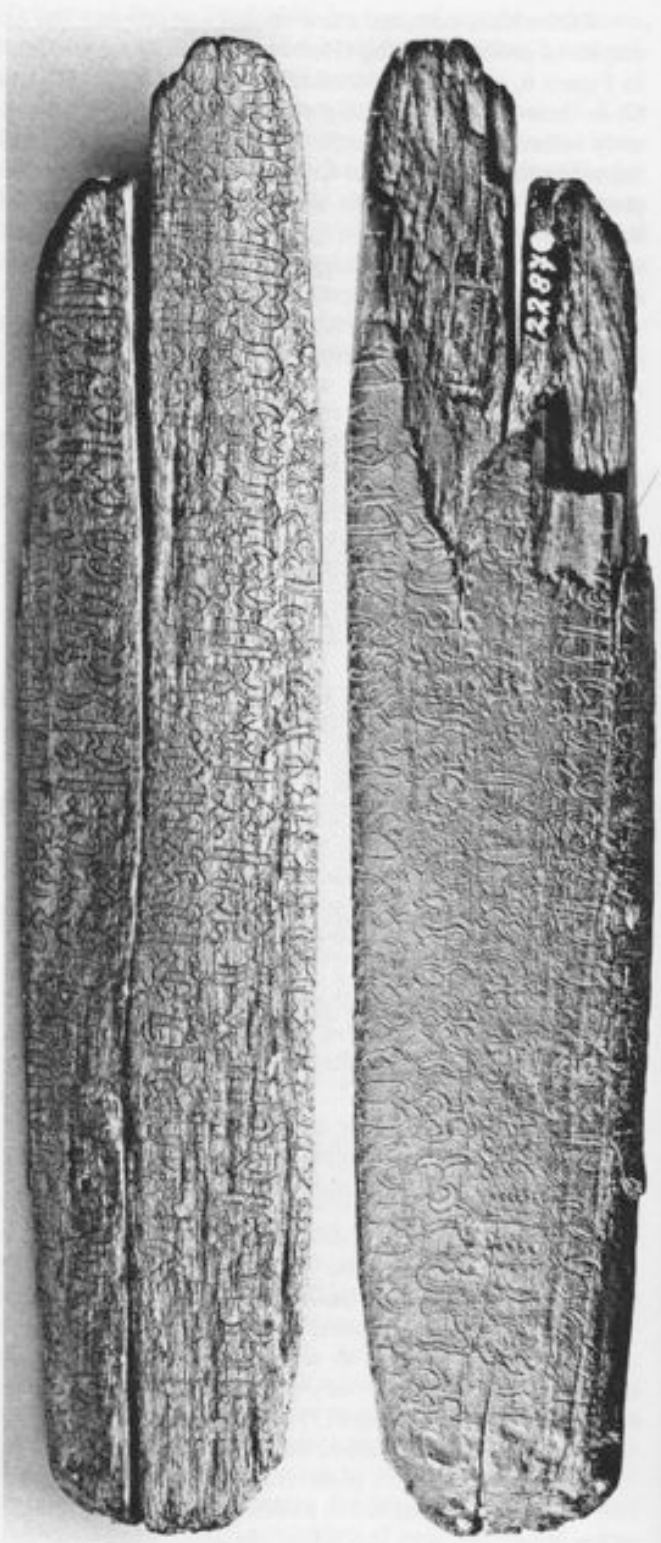

Figure 8. Small Vienna tablet, left: side a, right: side b (photographs courtesy of the Museum für Völkerkunde, Vienna).

Figure 9. Parallel fragments shared between Small Vienna tablet, Keiti, Mamari and other inscriptions.

The same effect is observable in parallel passages beginning with 1.62-3.70-60 (Cb12) and 62.1.3-70-60 (Pr2, Hr3). Further comparison of Sa1 and Cb1 offers direct proof that Glyph 96 is composed of two stacked signs 95 (Figure 9).

Line Na5 contains a passage that opens *rongorongo* inscriptions C, H and P. Curiously, the text of the Small Vienna tablet has bird Glyph 607 preceding the double-body man Glyph 208, while in other versions of this phrase the characteristic down-hanging wing of the bird usually follows Sign 208 (Figure 9, Ca1), or both glyphs are substituted with a linked pair of birds (Er9, Ra6). Yet another transposition occurs for the Signs 7 and 1, which are written 1-7 in all other occurrences of the phrase. Line Na5 continues with an extended version of a fragment opening Ev1, which can be also found in Ev6 and Ca1. The "breadfruit tree" Glyph 34 appears here in its simplified form 34v; the parallel passages Sa2, Aa2 and a "hybrid" sign 124v from *reimiro* text La1 (Figure 9) prove that both forms are interchangeable. Remarkably, despite significant changes seen in surrounding glyphs, the "lozenge" signs keep their places – rounded glyph 2a is followed by 34 and diamond-shaped Version 2 is associated with Glyph 1. The important implications of this observation will be discussed in the next section.

The comparison of Lines Nb1 and Ev7 prove the allography of Signs 125 and 35. Glyphs 62.64 and 9, appearing in both texts, reveal that the scribe of Keiti omitted a forked top of Sign 64 – which he also did in the same group 62.64-9 (Ev3) and in a common ligature 4.64 (Figure 9, $Ev6_2$). The parallel sequences in lines $Ev6_2$ and Ra5 displays a mirroring of Sign 522, which is seemingly insignificant, as it also takes place in fragments Sa2, Aa2 and Na3, Ev4 (Figure 9). Further on, one can see a possible merging of Glyphs 59-324 (marked with an arrow). Signs 326 = 324 and 4.64 are written in switched order in texts Nb3 and $Ev6_2$. Yet another side-switching occurs for Ligature 244.78, which appears as 78.254 in Line Ev8. Such a multitude of sign order swapping is curious, as it should modify the order of phonetic units corresponding to the inscription. Yet, the carefully finished glyph contours suggest that each version of the text was completed properly and was acceptable to the carvers. Additional research is required to answer this question.

The allography of Glyphs 68 and 55 was discussed elsewhere (Horley 2009b:259). In addition to the listed parallel texts Nb5 and Pr3 (Figure 9), one should also consider two other passages with multiple repetition of sign group 62.6-1, appearing in Lines Ev3 and Sa2.

Analysis of Allographic Forms

A comparison of parallel fragments in Lines Sa5, Ca14 and Na3 (Figure 9) suggests allography of Signs 30, 95f and 3. More passages confirm that Glyphs 95f and 30 are equal: Bv6, Pv3 (Figure 10) and Pozdniakov sequence 220.4.64-220.132-144f-4-95f-450.33 (Hv12) and 4.64-6:700-30-450.3 (Ra5, Figure 9). The allography of Glyphs 30 and 3, seemingly additionally proved by fragments Pr3 and Hr4 (Figure

Figure 10. Possible interchangeability of single and double "feather garland" signs 3 and 30 = 95f.

10), suggests that Sign 30 may be the long-searched isolated form of Glyph 3. If true, one can explain the formation of ligatures with "feathered garlands" — 3 attached both to hands and elbows of anthropomorphic signs (Figure 10, Sa5, $Bv4_1$) and by a partial fusion of Glyph 30 illustrated on the right.

This identification clarifies that there are only two components in a perplexing ligature 3.1 with "double garland" (Figure 10, Cb9, Br4). These "double garlands" in lines Cb9, Br4 and Cb1 (Figure 9) are shown as singles in Barthel's tracings; the actual shape of these glyphs can be seen in high-quality photographs of the original artifacts (Orliac and Orliac 2008: 253, 255).

Moreover, detailed pictures of tablet Mamari reveal another inaccuracy in Barthel's tracings – the first ligature illustrated for Line Cb10 is supplied with Hand 6 in place of the gaping-mouth head 451 (code assigned following Barthel's identification of the corresponding glyph in text Hr4). The difficulties in explaining the spelling variations were discussed by Guy (2006: 64-65). The current correction of tracings solves this problem, proving that the only "spelling deviation" among the copies of this ligature is Glyph 456f.3 in Line Pr3, added with a hand and a "feather garland". Additionally, Ligature 59.451 allows for the detection of another parallel fragment for this sequence (Figure 9, $Bv4_2$) that seemingly remained unnoticed. The most important, however, is the pronounced stability of the "lozenge" glyph types (Figure 9 Na5, Ev1, Ev6). All have Barthel's Code 2, with two main forms drawn as "hollow diamonds" (Figure 11, signs 2, 2c) and "divided diamonds" (2a, 2d). The actual glyphs are more distinct – "diamond lozenges" are angular and may feature small "beads" at their corners, while "divided lozenges" are rounded and usually unadorned. Neither

Figure 11. "Lozenge" signs: corrections to Barthel's tracings and evidence for possibly different role of glyphs 2 and 2a.

transcriptions nor concordances from Grundlagen differentiate between these types (Barthel 1958:85-86). Barthel's tracings also seem to prove that signs 2 and 2a are equal (Figure 11, Hr2, Pr2; Hr7, Pr6; Pr7, Qr7), which is not verified in the photographs. The passages written on different sides of the same object (with low possibility of direct copying) also conserve "lozenge" types (Figure 11, Aa5, Ab7) despite that the surrounding signs vary significantly – Glyph 5 seems to appear upside-down as a head of anthropomorph 296f (implying downward reading order), signs 400-430 switch their places, Glyph 670 changes into 379.55 and foot of Sign 755 turns into a tailfin (Fig. 11ure Aa5, Ab7).

Lines Pr4/5 and Hr5, famous for their upward-reading ligatures 200.8 and 200.1 (Pozdniakov 1996: 297; Guy 2006: 57) also contain text 200.5-2a-5-2a that can be compacted by stacking Sign 2a over Glyph 5 in a downward-reading ligature (Figure 11, Hr5). Another simplification of "divided lozenges" consists in partial omission of a glyph, sometimes followed by drawing a single contour line (Barthel's Sign 20). This approach is pronounced for duplications 2a-2a, which becomes 2a-20 or 20-20 (Figure 11, Aa7, Ra7). In contrast, half-glyph carving is very unusual for the "diamond lozenges". It appears explicitly as Glyph 2v in lines Pv3 (Fig. 10) and Qv4 – perhaps a ligature 1.2. Other possible examples include diamond shapes inside Glyph 159 particular to Large Washington tablet, lines Sa5 (Figure 10) and Sa7. However, these can be mere adornments as Glyph 159 is an allograph to Sign 29 (Horley 2007: 30).

It is tempting to suggest the "beads" attached to "diamond lozenges" are meaningful. Nevertheless, analysis of Glyphs 2 in the same context shows that "beads" are added/dispensed seemingly by the whim of the scribe (Figure 11, Aa5, Ab7; Cb8, Cb11). Moreover, "beads" also may appear as space-fillers (Figure 11, Br1, Br6, Bv3, Gr4). The number of "diamonds" themselves varies with the available space (Figure 11, Er5, Er7; Fig. 9, Na5, Ev1). In very rare cases (Cb9, I03 and Rb5), "lozenges" have both vertical lines and "beads". The example from Line Cb9 (Figure 11) suggests that these may be scribal corrections: if we consider this sign as a pure "diamond lozenge" 2, the pattern 2-60 will be repeating thrice.

Further analysis of Lines Cb9/10 and Ca9/10 (Figure 11) reveals their parallelism with "diamond lozenges" clearly matched. Substitution of "marine creature" Sign 730 with Glyph 205 is perplexing, but the next Group 10.2-69-2-5-2 is well-synchronized (with variation of the number of "diamonds" in the first Glyph 2 and place-switching of the two next sign pairs). The triplicate group 200.200.201 from Ca9 may correspond either to double-body man 208 with the next headless Sign 546, or another triplicate group 95-95.95 from Line Cb9 (Figure 11). Finally, the famous fragment with "the same figure in three successive postures" (Guy n.d.)

starting on line Cb10 (one should also include here a fourth figure 445.002 from the end of line Cb9), usually thought to be "unique in the whole RR corpus and resembling a raw pictorial strip" (Melka 2009: 127) gets a parallel passage from the same artifact. If we consider hand allography 6=64=61, glyphs 480, 381 and 481 will become calligraphic variants of each other (Figure 11, Cb10, Ca10). This identification solves the problem of "strong gestural movements" (ibid) in passage Cb10, reducing it to aesthetical preferences of the scribe.

Conclusions

This research distilled three independent high-resolution image sets documenting the original tablet Keiti – photographs by S. Hoare, J. Weisser and rubbings by A. Pinart. The analysis of the images detected several scribal corrections and suggested amendments to Barthel's tracings and transcriptions. Allographic analysis proposes a connection between single and double "feather garland" Glyphs 3, 30 (95f) and explained ligature formation.

Barthel's Glyph 2 should be split into two distinct glyphs – "diamond lozenges" 2 and "divided lozenges" 2a that seem to have distinct usage patterns. The latter glyph is closely related to Sign 20 and may form rounded heads of Glyphs 500-509. The "beads" adorning "diamond lozenges" 2 so far appear to be decorative. I also suggest a solution to an unusual "pictorial strip" in Line Cb10, which can be explained by calligraphic variations as its parallel text was identified.

Several questions are highlighted for further discussion, such as instances of glyph order switching and existence of downward-reading ligatures in addition to upward-reading ones (the dominant type attested previously).

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