

# **INA BISA KATA: AN EXPERIMENTAL DECIPHERMENT OF THE CALATAGAN POT INSCRIPTION\***

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## **I. Introduction**

It has been almost fifty years since the Calatagan Pot, a unique artifact with an inscription around its shoulder was discovered in the late 1950s in conjunction with comprehensive archeological diggings in Calatagan, Batangas (Cf. Fig. 1) by a Philippine National Museum team headed by the archeologist Robert B. Fox. The inscription has remained a puzzle for decades despite numerous attempts to decipher it. Because of the difficulties in deciphering the Calatagan Pot Inscription (CPI), many have raised suspicions of forgery even though some experts remain convinced about its authenticity. For example, writing before the discovery of the Laguna Copperplate Inscription (LCI) in 1989, the palaeographer and Sanskrit expert Juan Francisco wrote that, "pending discovery of further proofs, let it be considered that this inscription carries the burden of archaeological proof of ancient Philippine writing" (1973, 14). The archaeologist Eusebio Dizon (2003, 41) reports that an expert on Indonesian palaeography, Johannes de Casparis, upon examining the pot closely, "came to conclude that it was not a fake as evidenced by the inscription itself. He maintained that it would be very difficult to fake such an inscription."

Regarding the problem of dating, Francisco wrote, "All the associations of this single artifact has been with these Chinese and Siamese wares which may be dated as falling into the period between the late 14<sup>th</sup> century and the end of the 15<sup>th</sup> century or the early part of the 16<sup>th</sup> century... In spite of its associations which would make more or less the Fourteenth Century as its *terminus a quo*, it can still be assumed that the script itself may have been introduced far earlier than that date, since writing in the Southeast Asian region was already widely used from the early centuries of the Christian Era. It may be further assumed that the earliest date in which it was introduced in the area would be toward the early part of the Twelfth Century" (1973, 41). The pot which is 12.0 cm tall, 20.2 cm wide and weighs 872 gm has resisted attempts at more accurate dating. Dating

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by Accelerated Mass Spectroscopy (AMS) in 1993 resulted in erroneous dates of 6,000 BC outside the pot and 2,000 BC inside the pot (Dizon 2003, 41).

Sometime in the sixties, the National Museum approached the sculptor Guillermo Tolentino to help in deciphering the CPI. Tolentino was known for his fascination with the ancient Tagalog *baybayin* but his "decipherment" was deemed unacceptable on scientific grounds because it was achieved by means of conducting a *séance* wherein he supposedly interrogated the spirit of the purported author of the inscription as to its meaning. According to Santos (1996d), Tolentino's rather puzzling transliteration is as follows:

*Labag man nga lang (sa) aki't (kalooban)*  
*Kanino man, kay ina'y mag-alay,*  
*gaano man ang kanyang kakailanganin, (sa kabila)*  
*Aba! kanino man nga iyan galing,*  
*labis ang ganyang ating*  
*pakikinabangin (sa wakas) (na pagpapala ni Bathala).*


(Though it may be against me and (my will)  
Whoever, offer to mother  
Whatever she may need (there beyond)  
And from whoever that may have come from  
We will benefit  
Greatly from it (in the end) (with God's grace).)

Those who have tried to decipher the CPI using more scientific approaches include Juan Francisco, Jean-Paul Potet, Antoon Postma, Harold Conklin and Johannes de Casparis but none of them have been able to produce a transliteration, whether complete or partial. Only Francisco and Potet have so far come up with more or less complete symbol equivalences but have nevertheless not been able to discover the actual language of the CPI. Francisco accomplished his preliminary series of equivalences by means of sensitive and rigorous paleographic analysis with reference to known syllabic scripts or syllabaries (known as *baybayin* or *surat* in the Philippines) but according to him, "I can offer no possible transliteration of the inscription owing to the difficulty of identifying some of the symbols, as indicated in the above attempt to identify them" (1973, 39). However, his observation that the script seems to be a combination of the "curvilinear" and "lineo-angular" traits of the Surat Mangyan in Mindoro and the Surat Tagbanuwa in Palawan (Cf. Table 15) is quite significant given the geographical proximity of these to islands to Batangas (1973, 32). Francisco underlined the importance of deciphering the CPI:

The successful decipherment of the inscription would open many "dark rooms" in Philippine pre-and proto-history. For instance, the symbols will thus have been fully identified and it would thus show the various forms of the letters as they were known and used in prehistoric times. After this is successfully done, perhaps paleographers would then be able to give a better typological analysis of Philippine scripts generally. Furthermore, the decipherment of this inscription

would also open to linguistic scientists a new field of study in terms of the structure of the Tagalog or Mangyan languages in Pre-Hispanic times. Indeed, this inscription is truly significant in the attempt to understand the many vague aspects of Philippine cultural history (1973, 39).

Anyone who seriously attempted such a transcription would be faced with at least three seemingly insuperable problems:

- 1) The equivalents of most of the symbols are unknown.
- 2) The language(s) composing the CPI is/are unknown, though the possibility of Tagalog or Mangyan has been posited.
- 3) Even if the symbols were successfully identified, the difficulties in determining the start and end of words and the determination of final consonants would be exceedingly difficult. *Baybayin* texts (even up to now in the Mindoro area) are written without word separators and final consonants. Meaningful words such as "pakpak," "padpad," "paspas," "pagpag," "palpak" etc. are all written alike (for ex.  in the Tagalog *baybayin*) in the Philippine syllabaries. This presents little difficulty for those immersed in its use like the Mangyan and the pre-Hispanic Filipinos but is exceedingly difficult for outsiders to master.




The present experimental effort at decipherment will therefore try to work on what has been determined by palaeographical techniques and try to expand on this by using some cryptographic and trial-and-error methods. The abovementioned obstacles however continually work against any definitive and final reading and always introduces a rather large margin of error. With respect to the CPI, the relative plausibility of the transliteration is therefore more significant than its definitiveness.

## II. The Transcription of the Inscription







The accuracy of the existing transcriptions is still a major issue. Three sources have served as the basis for the current analysis. The first one is the artistic rendition of the CPI in Francisco's pioneering study (1973, 101). The second is the corrected version by Santos (1996a) which added a missing symbol to Francisco's version (Cf. Figure 2). The third is the somewhat idiosyncratic rendition by Oropilla (Dizon 2003, 40). All three versions agree with one another to a very great extent. However, the author's own cursory inspection of the pot raised doubts regarding the diacritical mark above the symbol in position 6-3 which will here be provisionally treated as being unmarked until a more convincing transcription of the whole CPI becomes available. The markings on the pot are generally shallow and it is sometimes hard to differentiate genuinely meaningful markings from surface scratches.

## III. Direction of Reading









Fig. 2 shows the symbols of the CPI numbered from position 0 to position 6-5 from right to left (Cf. Table 1 for a more conventional arrangement of the symbols.) This is the proposed direction of reading of the CPI. Francisco had become too certain that the

inscription should be read from left to right (1973, 39). He held onto this opinion even though the actual writing almost certainly started from the symbol  because the inscription overshot the diameter of the pot's rim and had to end below the original starting point at the symbol . As opposed to Potet, who asserted that the symbol  is an ending marker similar to that employed in the *Doctrina Christiana en lengua española y tagala* (1593), it shall here be considered as a starting marker analogous to that which was also used in the latter, which was printed using a xylographic press in both the ancient Tagalog *baybayin* and the Roman alphabet. Kuipers (2003, 5) also found that the direction of writing among the Mangyans of Mindoro varied and sometimes, even the orientations of the letters were inverted.

#### IV. Grouping of the Symbols and Preliminary Equivalences




It can be observed in Table 3 that the symbols have been grouped into 13 different types. This differs from Francisco who grouped  and  together and put  in another group. This cannot be considered correct since the first two symbols are obviously quite different. The symbols  and  should instead be grouped together since one can consider the short and straight vertical line at the lower part of the second symbol to be a diacritical mark indicating that this is a consonant followed by a vowel "o"/"u." This is similar if not identical to the diacritical markings employed in the Surat Mangyan system (Cf. Table 15). Another difference is that Francisco considered the symbol  to have a sound value. It has already been mentioned above that this symbol is considered here to be a starting marker. The vertical line | separating the six sections of the text are considered to indicate the endings of sentences, lines or phrases. This is also present in the *Doctrina Cristiana* in the form ||. Lacking spaces between words, such markers are valuable indicators in the CPI of at least where some words start and end.








Five symbols (5) out of the total thirteen in the CPI can be ascertained to be consonants since these have been written with diacritical marks positioned above or below the character. A diacritical mark (or *kudlit*) above the symbol means that a consonant will be followed by the vowel "e"/"i" while one below the symbol means that it will be followed by the vowel "o"/"u." It has already been noted above that like the Surat Bugis (Cf. Table 15), the original *baybayin* systems in the Philippines possessed no so-called "vowel killer" (*virama*) which can allow the representation of ending consonants after a consonant-vowel cluster (C-V-C) .



Four of these five known consonants in the CPI have already been adequately identified by Francisco. Following Francisco,  will here be equated with *ba* in the Tagalog *baybayin* , the symbol  will be assumed to be equal to *ka*  and  as equal to *na* . Despite Francisco's misgivings because of its inverted orientation, *ma*  in the CPI will here be equated with the Tagalog *ma* .

The net result of this preliminary set of equivalences is that the analysis can begin with four symbols having assigned values and nine with unknown values (Cf. Table 3).

## V. The Fifth Line of the Inscription

If we refer to Table 1, it will be noticed that out of the six individual or unique symbols comprising the fifth line (of a total of 7 since the symbol  in position 5-3 repeats in 5-7), there are now assigned values to four symbols. Only two symbols,  at position 5-2 and  at positions 5-3 at 5-7 have no definite equivalents (The boxes corresponding to those symbols with assigned values have been shaded black below.)








5							
	KE/KI	?	?	NA	MA	BA	?
	5-1 (28)	5-2 (29)	5-3 (31)	5-4 (32)	5-5 (33)	5-6 (34)	5-7 (35)

Using a simple formula to calculate for permutations wherein two symbols may each have fourteen different possible values (but not at the same time):  $P = 14!/(14-2)!$ . The result is 182 possible permutations for line 5. A computer program generated all possible permutations for the symbols  at position 5-2 and  at positions 5-3 and 5-7.

```
L = open('calatagan.txt', 'w')
ctr = 1
CHR1 = "b"
CHR2 = "k"
CHR3 = "n"
CHR4 = "m"
for x5 in ["a", "e", "o", "da", "ga", "ha", "la", "nga", "pa", "ra", "sa", "ta", "wa", "ya"]:
    CHR5 = x5
    for x6 in ["a", "e", "o", "da", "ga", "ha", "la", "nga", "pa", "ra", "sa", "ta", "wa", "ya"]:
        CHR6 = x6
        if CHR5 == CHR6: continue
        print str(ctr) + ':' + CHR1 + ' ' + CHR2 + ' ' + CHR3 + ' ' + CHR5 + ' ' + CHR6 + ' ' + CHR4
        print
        L.write(str(ctr) + ':' + CHR1 + ' ' + CHR2 + ' ' + CHR3 + ' ' + CHR5 + ' ' + CHR6 + ' ' + CHR4 + '\n' + '\n')
        L.write(CHR2 + 'e' + ' ' + CHR5 + ' ' + CHR6 + ' ' + CHR3 + 'a' + ' ' + CHR4 + 'a' + CHR1 + 'a' + ' ' + CHR6 + '\n' + '\n')
        ctr = ctr + 1
```

(Written in Python. Cf. [www.python.org](http://www.python.org))

The permutations generated can be analyzed for any promising meanings or word shapes they may produce. In this particular case, permutation no. 154 seems to offer one of the most interesting possibilities for interpretation. This is the following:

5							
	KE/KI	TA	SA	NA	MA	BA	SA
	5-1 (28)	5-2 (29)	5-3 (31)	5-4 (32)	5-5 (33)	5-6 (34)	5-7 (35)

Unlike all the other permutations produced, this is already from the beginning a seemingly meaningful phrase for someone who reads Tagalog, although there is still a great chance that this is still a chance construction and that the language may not even be Tagalog. (A further study of the generated table of permutations may indeed offer other more fruitful combinations.) But the appearance of the word "kita" at positions 5-1 and 5-2 is very significant because if the CPI text is looked at as a whole, the word "kita"

appears once more at lines 2-3 and 2-4. This is a very valuable piece of information, not least because it may indicate the locations where at least some words start and end in the CPI, before and after "kita."

KE/KI	TA
5-1 (28)	5-2 (29)

KE/KI	TA
2-3 (9)	2-4 (10)

"Kita" generally translates as "we," which includes the person(s) spoken to ("tayo" in Tagalog), but may also be used for "I" in Malay. However, in old Javanese and in the Sarawak and Iban languages of Borneo, which is nearest to the Philippines, it is also used for "you" (Greenhill, Blust and Gray 2003-2008). From the paleographic viewpoint, it may be noticed here how the symbol Ɔ in the CPI shares evident similarities with the angular symbols for *sa* Ɔ and *la* Ɔ of the Surat Mangyan system. Though Francisco equated Ɔ with *la*, this symbol will here be equated with *sa* in conformity with permutation no. 154. On the other hand, the symbol Ɔ in the CPI shares evident similarities (though seemingly in mirror-image) with the *ta* Ɔ in the Baybaying Tagalog and Bikol Ɔ which are both said to derive from *ta* of the Pallava system of South India (Court 1996, 448).

## VI. The First Line of the Inscription

At this point, six symbols now have assigned values while seven are still unassigned. In order to take full advantage of these six symbols, the first line of the text can be considered in the analysis. It will here be immediately noticed that all the symbols except one Ɔ at position 1-1 in line number 1 already have assigned equivalents.







1						
	?	NA	BE/BI	SA	KA	TA
	1-1 (1)	1-2 (2)	1-3 (3)	1-4 (4)	1-5 (5)	1-6 (6)

The assignment of the value *sa* for the symbol Ɔ in CPI as proposed from the previous reading of line 5 produces the word "bisa" at positions 1-3 and 1-4. The previous assignment of *ta* for the symbol Ɔ in CPI produces "kata." "Bisa" means "can"/"able to" in Malay. In Tagalog, "bisa" can mean "efficacy," "effect" or "potency" (Panganiban 1972). On the other hand, the word "kata" is Sanskrit in origin which means "word" but also "says"/"said," and its earliest date of appearance in the Malay Concordance Project (MCP) database of ancient Malay texts is ±1370. Malay "kata" is related to the Tagalog words "makata" (poet) and "katha" (fiction). It may also mean "idle talk" as in "kata-kata." An alternative Tagalog meaning is "we" or "the two of us" (Panganiban 1972). The last part of line 1 reads as "bisa kata" in seemingly Malay style. The question now however is who this subject "who can say something" actually is? And what did he or she actually say? The symbol Ɔ will here be equated hypothetically with the vowel *e/i*. The combination of Ɔ and Ɔ now produced the word "ina" (mother) which is well-known throughout the vast area of Austronesian languages and known in its proto-Austronesian form as *\*t-ina*. If this first line is compared with the Mangyan poetic form known as *ambahan*, some similarities can immediately be detected. Though the *ambahan* generally

follows the heptasyllabic meter of ancient Filipino poetic forms, the first line is frequently exempted from the meter. It is not uncommon for the *ambahan* to begin with the word "magkunkuno" (to say/utter). Postma's *ambahan* collection (1970) gives the following examples:










<i>magkunkuno ti tawo</i> (the person said)	[7 syllables]
<i>magkunkuno ti karadwa</i> (the soul said)	[8 syllables]
<i>magkunkuno ti urong</i> (the lobster said)	[7 syllables]
<i>magkunkuno ti babayi</i> (the woman/mother said)	[8 syllables]
<i>magkunkuno ti ina Laybay</i> (mother Laybay said)	[9 syllables]




It will be observed that the first line of the CPI (like the sixth) has only six syllables in contrast with the seven syllables of the succeeding four lines and therefore does not follow the seven syllable meter as well. It should also be noted that the CPI of six lines is more like the *ambahan* than the short Tagalog poetic form known as *tanaga* which, like the 15<sup>th</sup> C. Malay *pantun*, is a quatrain.















1						
	I/E	NA	BE/BI	SA	KA	TA
	1-1 (1)	1-2 (2)	1-3 (3)	1-4 (4)	1-5 (5)	1-6 (6)

### VII. The Second, Third and Fourth Lines of the Inscription

At this point of the experimental reconstruction of the CPI, there are now seven symbols with assigned hypothetical values and six with none. The balance has therefore been shifted towards the side of the symbols with assigned values. Two lines out of six in the CPI now have proposed readings.

This part of the analysis is even more difficult given the fact that lines 2, 3 and 4 each have three out of seven symbols with no assigned values. But this step would have been even more difficult, if not unthinkable, without the initial breakthrough provided by proposed reading of line 5. In the second line, the symbols ,  and  do not have equivalents, the same goes for the symbols ,  and  in the third line, and the fourth line also has the following symbols without determinate values ,  and .

It may be observed that the symbols which appear more than once in the CPI may give more clues (since they have to produce meaning in two or more different locations much as the so-called *crossed* cells in a crossword puzzle simultaneously gives information on two words) than the ones which appear just once such as the symbols  at position 2-5,  at 3-2 and  at 6-5.

2							
	?	NA	KE/KI	TA	?	?	BA
	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)
3							
	?	?	SA	?	KA	KA	E/I
	3-1 (14)	3-2 (15)	3-3 (16)	3-4 (17)	3-5 (18)	3-6 (19)	3-7 (20)

4	𑀓	𑀓	𑀘	𑀕	𑀡	𑀕	𑀓
	?	?	?	NE/NI	MA	NO/NU	?
	4-1 (21)	4-2 (22)	4-3 (23)	4-4 (24)	4-5 (25)	4-6 (26)	4-7 (27)

To start off this stage of the analysis, the characteristics of the combined second, third and fourth lines can be analyzed. This part of the text is made up of a total of twenty-one symbols of which eleven already have assigned values. It is more specifically made up of seven unique symbols with assigned hypothetical values and five unique symbols with unknown values. Three symbols ( 𑀓 at positions 2-1 and 4-7, 𑀘 at 2-6 and 3-4, 𑀓 at 3-1, 4-1 and 4-3) appear more than once in this section of the CPI. Given the complexity of this configuration, there seems to be no other choice than to try plugging in values into these multiply occurring symbols in order to try to produce meaningful lexical items in more than one location. Given the paucity of additional information, this can only proceed by trial and error while leaning heavily on the initial clues on the initially apparent Malay characteristics of the CPI. For example, if the symbol 𑀘 is given the value *ya*, the word "saya" appears at position 3-3 and 3-4. "Saya" means "I" in Modern Malay and is derived from Sanskrit "sahaya" meaning "slave." Its earliest appearance in the MCP in its modern form is ±1525. It is however still not known at this point, if this equivalence is correct, what words arise at the other positions of 𑀘 at 2-6 and 4-3.

The symbol 𑀓 can be hypothetically assigned the value *ga* in order to produce the word "gu-na" at positions 2-1 and 2-2. (Since there is a diacritical mark below the symbol 𑀓, this means that the consonant "g" should be followed by the vowel "o/u" producing "gu.") "Guna," according to Wilkinson (1957) is a Sanskrit derived word meaning "the virtue in anything" referring either to "magical potency" or "usefulness." It also means "use," "importance," "advantage" or "for," "in behalf of," "for the benefit of," "to" etc. (Wojowisato and Wasito 1980). It is also found in Tagalog as "gunáguná," meaning "enjoyment of something while one may do so or before losing the chance." Its more magical meaning as a philtre with powerful properties can be found in the Kapampangan "guna" and in Tagalog as "gayuma" (Panganiban 1972). Its earliest date of appearance in the MCP is ±1370. At this point, the words 𑀓 produces at 4-7 and 6-3 still cannot be ascertained. From the paleographic point of view, once again, one may notice the strong similarity of 𑀓 with the *ga* in Tagalog-1 𑀓 in Table 15.

2	𑀓	𑀕	𑀕	𑀘	𑀓	𑀘	𑀓
	GO/GU	NA	KE/KI	TA	?	YA	BA
	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)
3	𑀓	𑀓	𑀘	𑀘	𑀕	𑀕	𑀓
	?	?	SA	YA	KA	KA	E/I
	3-1 (14)	3-2 (15)	3-3 (16)	3-4 (17)	3-5 (18)	3-6 (19)	3-7 (20)
4	𑀓	𑀓	𑀘	𑀕	𑀡	𑀕	𑀓
	?	?	YA	NE/NI	MA	NO/NU	GE/GI
	4-1 (21)	4-2 (22)	4-3 (23)	4-4 (24)	4-5 (25)	4-6 (26)	4-7 (27)

Nine symbols now have proposed values while only four remain unassigned. The nine possible remaining sound equivalents are *a*, *o*, *nga*, *da*, *pa*, *ra*, *la*, *wa*, and *ha*. Only one symbol 𑀓 in line 2 at position 2-5 has no assigned value yet.

2	𑄆	𑄇	𑄈	𑄉	𑄊	𑄋	𑄌
	GO/GU	NA	KE/KI	TA	?	YA	BA
	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)

The assignment of *pa* to 𑄊 will be proposed here in order to form the word "payaba." This is a word in the Bikol language meaning "cherished one," although it is more generally known as "padaba" in the more prevalent Bikol speaking areas. The whole second line may therefore read, "guna kita payaba" ("for us-you cherished one/child"). This phrase is therefore a combination of Old Malay and Bikolano. The word "ina" in the first line of the CPI, aside from being a Tagalog word, is also Bikol for "mother" (Mintz 1985). An "ina" (mother) is therefore seemingly addressing her "child" (payaba) in the CPI. This admixture of Malay with local languages in inscriptions is apparently quite a regular phenomenon. Postma's translation of the Laguna Copper Plate Inscription (1991) for example, contained the odd word "barngaran" which is used as an equivalent for "barnama" but uses the Tagalog derived "ngaran"/"ngalan" rather than the Sanskrit derived "nama" combined with the prefix "bar-".






2	𑄆	𑄇	𑄈	𑄉	𑄊	𑄋	𑄌
	GO/GU	NA	KE/KI	TA	PA	YA	BA
	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)

Difficulties in the decipherment of lines 3 and 4 forces the current analysis of the combined lines 2, 3 and 4 to stop at this point. This therefore leaves the question regarding the equivalences for the symbols 𑄉 (3-1, 4-1 and 4-2) and 𑄊 (3-2) open. Only line 2, in combination with line 1, has produced something resembling a plausible transliteration. Of all the problems presented by lines 3 and 4, apparently the most difficult one is the appearance of the word/syllable sequence *ma* 𑄉 + *no/nu* 𑄇 + *ge/gi* 𑄆 (*ma-no/nu-ge/gi*), which although meaning "fragrant" or "flower" in some Polynesian languages (Ranby 1980), could not be given a more plausible equivalent in Malay or in other Philippine languages in a way which accords with the current "Malay" interpretation of lines 1, 2 and 5. Other forms involving the insertion of consonants in between the consonant-verb clusters are indeed possible but this will not be attempted here. The assignment of *ga* to 𑄆 may indeed be mistaken but "guna" is just too powerful semantically to give up.

### VIII. The Sixth Line of the Inscription





The analysis can now move to the unassigned symbol 𑄍 at position 6-5. The equivalent of *nga* is here proposed in order to produce the word "bu-nga" ("flower" in Malay) at positions 6-4 and 6-5. "Bunga" in most Philippine languages refers not to "flower" but to "fruit." More specifically, "bunga" can also mean areca or betel nut palm which is a main ingredient in the tradition of betel nut chewing (Panganiban 1972). Paleographically, this symbol seems to be a version of the *nga* 𑄍 of the Surat Tagbanuwa rotated by 120° counterclockwise. If the line is completed and supplied with two additional consonants, it can be read as "bagaikan bunga" ("like a flower"), which is a regular phrase not only in Tagalog ("tulad ng bulaklak") but also in Malay poetry (Cf. MCP). If line 5 is read in

Malay fashion as "kita sana mabasah" (while mentally inserting the implicit "di" before "sana"), lines 5 and 6 can be literally translated together as "we/you there get wet/ like a flower."

6					
	BA	GA	KA	BO/BU	NGA
	6-1 (36)	6-2 (37)	6-3 (38)	6-4 (39)	6-5 (40)

### IX. Mirror Writing?

The partial results of the current analysis does not completely shut out the possibility that the CPI may in the end be an elaborate hoax. The scientific attitude towards such a contested and ideologically-laden object requires that this possibility should always be considered.

If the equivalences arrived at so far are accurate, one of the puzzling things which can be observed in the CPI is the phenomenon of at least two characters which exhibit signs of having been mirror-written. Fig. 3 shows the two-step transformational procedure which seemingly starts from the Bikol *ta*  and ends up with the Calatagan *ta* . The former was mirrored horizontally and then rotated 30° clockwise to produce the latter. The other observable example is the Bikol *pa*  which was seemingly mirrored vertically and rotated 30° counterclockwise to produce Calatagan *pa* . It is well-known that mirror-writing was an early form of code famously employed by Leonardo da Vinci in his personal notes and in his explanation of the Vitruvian man. Mirror-writing may have been employed in this case to produce characters which are invented but seemingly authentic. This is however only a possibility.

Two things may eventually lend more credence to the CPI's authenticity: (1) The discovery of other pots or objects with similar inscriptions and with more solid evidence of being genuine. (2) The complete and plausible transcription of the CPI which accords with well-founded anthropological, archeological and linguistic data.

### X. Some Observations Regarding the Transliteration

All the proposed values for the 11 symbols can now be substituted for the whole CPI according to the proposed table of equivalence shown as Table 5. The symbols themselves have been removed in Table 6 and only the Roman alphabet equivalences are left. If the present results are compared to Franciso and Potet, the percentage of similarity is only 43 percent. Between them, since Potet probably borrowed much from Francisco, the similarity is 58 percent. The three interpretations (including the current one), only concur with the syllables *ba*, *ka*, *ma* and *na*.

Table 9 shows the proposed grouping of syllables to form words. Table 10 shows the decisions of using e/i and o/u. Table 11 shows the addition of final consonants: "mabasa" + "h", "baga" + "y" + "ka" + "n." It is clear that all the steps which have been taken in this reconstruction of the CPI are all experimental in nature and inescapably subjective. But subjectivity is not the issue here, one should attempt rather, to make all the decisions

taken in the process of transliteration transparent and analyzable so that others may perhaps achieve better results. From the assignment of symbols, to their grouping, to the addition of final consonants and translation, it is arguable that dozens of possible interpretations are possible. The plausibility of the interpretation/transliteration becomes the foremost consideration since absolute accuracy is seemingly not possible given the current state of knowledge about the artifact.

Table 14 shows the three degrees of probability of strong (4 symbols), moderate (4 symbols) and weak (3 symbols) equivalence in which the symbols with assigned values have been grouped. Two symbols ( *ŕ* and *œ* ) remain unassigned. The proposition here is that the results of the current study may be "rolled back" in three sets if the experimental assignments to the two unknown symbols still resist a plausible transliteration. The assigned values of the weakly probable symbols can first be changed, if still no complete results are produced, the moderately probable ones can then be tested. Finally, if no plausible total reading can yet be arrived at, even the "strongly" probable symbols may themselves be reassigned. It should also be borne in mind that although Malay played a great role in the actual discovery procedure of the current study, it is still possible that the real key to a complete transliteration may rest with another language.

The whole deciphered fragment in its current interpretation is therefore as follows:

<i>Ina bisa kata</i>	Mother can say
<i>Guna kita payaba</i>	For you my beloved child/ For our benefit beloved child
<i>.... saya .....</i>	... I ...
<i>.....</i>	<i>.....</i>
<i>Kita sana mabasah</i>	There we/you get wet
<i>Bagaikan bunga</i>	Like a flower

The present study has shown, perhaps for the first time, the appearance of certain words in more or less plausible configurations in four lines of the CPI. Above all, it may have helped in developing a productive technique to be used in the further analysis of the CPI. It has however not been successful in producing a complete transliteration.



Fig. 1: Map of Calatagan, Batangas

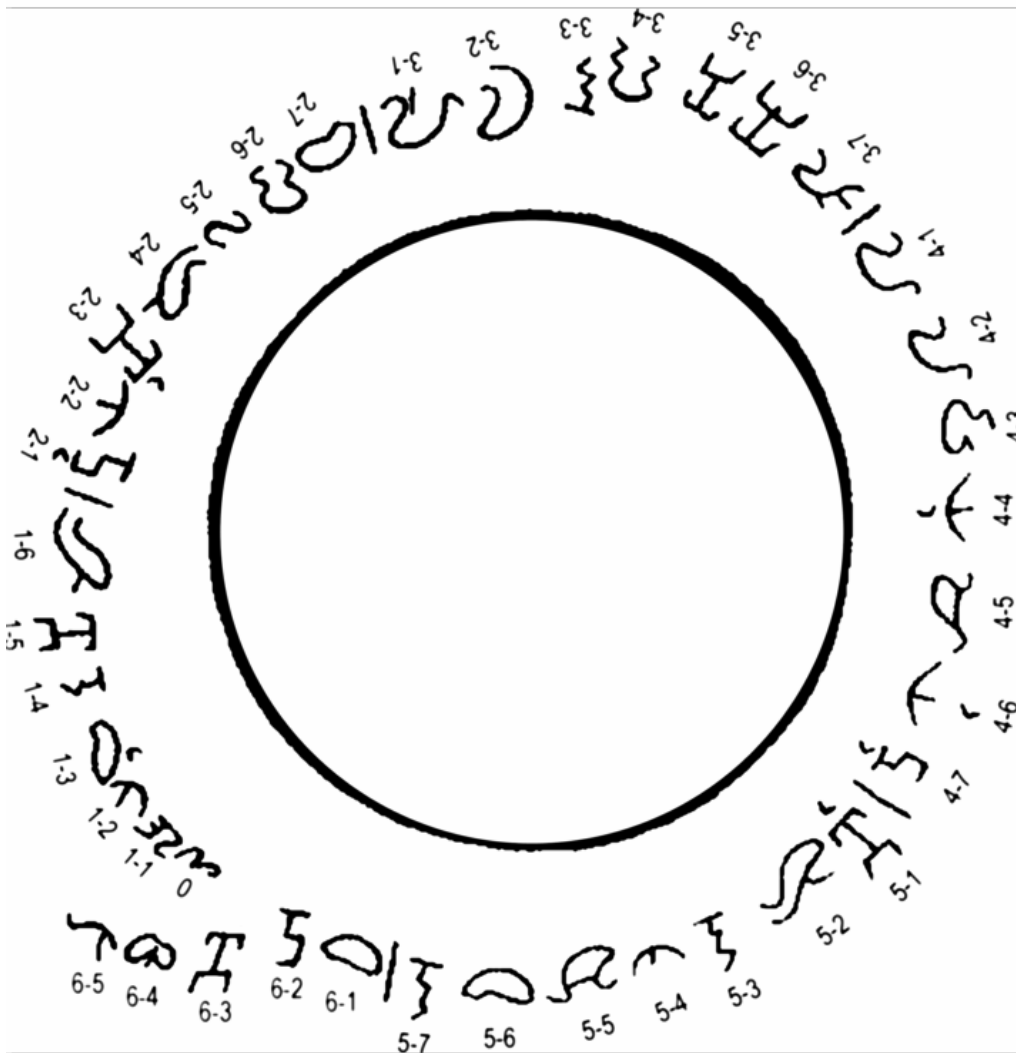


Fig. 2: The Calatagan Pot Symbols as arranged around the shoulder of the pot (Santos (1996a))

1	∞	ℛ	⤴	⊖	⚡	⚡	⚡	
	0	1-1 (1)	1-2 (2)	1-3 (3)	1-4 (4)	1-5 (5)	1-6 (6)	
2	⤴	⚡	⤴	⚡	⚡	∞	∞	⊖
	-	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)
3	⤴	ℛ	℞	⚡	∞	⚡	⚡	ℛ
	-	3-1 (14)	3-2 (15)	3-3 (16)	3-4 (17)	3-5 (18)	3-6 (19)	3-7 (20)
4	⤴	ℛ	ℛ	∞	⤴	⤴	⤴	⚡
	-	4-1 (21)	4-2 (22)	4-3 (23)	4-4 (24)	4-5 (25)	4-6 (26)	4-7 (27)
5	⤴	⚡	⚡	⚡	⤴	⤴	⊖	⚡
	-	5-1 (28)	5-2 (29)	5-3 (31)	5-4 (32)	5-5 (33)	5-6 (34)	5-7 (35)
6	⤴	⊖	⚡	⚡	⊖	⤴		
	-	6-1 (36)	6-2 (37)	6-3 (38)	6-4 (39)	6-5 (40)		

Table 1: Sequence of the Symbols Read from the Right ∞ to the Left

1	ℛ	ℛ					
	1-1	3-7	[2]				
2	⤴	⤴	⤴	⤴	⤴		
	1-2	2-2	4-4	4-6	5-4	[5]	
3	⊖	⊖	⊖	⊖	⊖		
	1-3	2-7	5-6	6-1	6-4	[5]	
4	⚡	⚡	⚡	⚡			
	1-4	3-3	5-3	5-7	[4]		
5	⚡	⚡	⚡	⚡	⚡	⚡	
	1-5	2-3	3-5	3-6	5-1	6-3	[6]
6	⚡	⚡	⚡				
	1-6	2-4	5-2	[3]			
7	⚡	⚡	⚡				
	2-1	4-7	6-2	[3]			
8	∞						
	2-5	[1]					
9	∞	∞	∞				
	2-6	3-4	4-3	[3]			
10	ℛ	ℛ	ℛ				
	3-1	4-1	4-2	[3]			
11	℞						
	3-2	[1]					
12	⤴	⤴					
	4-5	5-5	[2]				
13	⤴						
	6-5	[1]					

Table 2: The Frequency of the Symbols (arranged by order of appearance)

Known Symbols (4)				Unknown Symbols (9)								
𐌲	𐌱	𐌰	𐌳	𐌶	𐌷	𐌸	𐌹	𐌺	𐌻	𐌼	𐌽	𐌾
Equivalents				Possible Equivalents (14)								
ba	ka	ma	na	a, e/i, o/u, da, ga, ha, la, nga, pa, ra, sa, ta, wa, ya								

Table 3: Preliminary Equivalences

1	𐌶	𐌶	𐌳	𐌲	𐌷	𐌱	𐌸	
		E/I	NA	BE/BI	SA	KA	TA	
	1-0	1-1 (1)	1-2 (2)	1-3 (3)	1-4 (4)	1-5 (5)	1-6 (6)	
2	𐌱	𐌹	𐌳	𐌱	𐌸	𐌺	𐌻	𐌲
		GO/GU	NA	KE/KI	TA	PA	YA	BA
	2-0	2-1 (7)	2-2 (8)	2-3 (9)	2-4 (10)	2-5 (11)	2-6 (12)	2-7 (13)
3	𐌱	𐌶	𐌷	𐌷	𐌻	𐌱	𐌱	𐌶
		?	?	SA	YA	KA	KA	E/I
	3-0	3-1 (14)	3-2 (15)	3-3 (16)	3-4 (17)	3-5 (18)	3-6 (19)	3-7 (20)
4	𐌱	𐌶	𐌶	𐌻	𐌳	𐌰	𐌳	𐌹
		?	?	YA	NE/NI	MA	NO/NU	GE/GI
	4-0	4-1 (21)	4-2 (22)	4-3 (23)	4-4 (24)	4-5 (25)	4-6 (26)	4-7 (27)
5	𐌱	𐌱	𐌸	𐌷	𐌳	𐌰	𐌲	𐌷
		KE/KI	TA	SA	NA	MA	BA	SA
	5-0	5-1 (28)	5-2 (29)	5-3 (31)	5-4 (32)	5-5 (33)	5-6 (34)	5-7 (35)
6	𐌱	𐌲	𐌹	𐌱	𐌲	𐌷		
		BA	GA	KA	BO/BU	NGA		
	6-0	6-1 (36)	6-2 (37)	6-3 (38)	6-4 (39)	6-5 (40)		

Table 4: The Resulting Equivalences of the Experimental Reconstruction

	ᜆ	ᜇ	ᜈ
=	A	E/I	O/U
	?	ᜉ	?

	ᜊ	ᜋ	ᜌ	ᜍ	ᜎ	ᜏ	ᜐ
=	KA KE/KI KO/KU	GA GE/GI GO/GU	NGA NGE/NGI NGO/NGU	TA TE/TI TO/TU	DA DE/DI DO/DU	NA NE/NI NO/NU	PA PE/PI PO/PU
	ᜑ	ᜒ	ᜓ	᜔	?	᜕	᜖

	᜗	᜘	᜙	᜚	᜛	᜜	᜝
=	BA BE/BI BO/BU	MA ME/MI MO/MU	YA YE/YI YO/YU	LA LE/LI LO/LU	WA WE/WI WO/WU	SA SE/SI SO/SU	HA HE/HI HO/HU
	᜞	ᜟ	ᜠ	?	?	ᜡ	?

Table 5: Table of Equivalence of the Symbols of the CPI with the Old Tagalog *Baybayin* (top row)

	1	2	3	4	5	6	7
1	e/i	na	bi/be	sa	ka	ta	
2	go/gu	na	ke/ki	ta	pa	ya	ba
3	?	?	sa	ya	ka	ka	e/i
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	ke/ki	ta	sa	na	ma	ba	sa
6	ba	ga	ka	bo/bu	nga		

Table 6: Extraction of Roman Alphabet Equivalents

	1	2	3	4	5	6	7
1	e/i	na	bi/be	sa	ka	ta	
F	ga	na	bi/be	la	ka	?	
2	go/gu	na	ke/ki	ta	pa	ya	ba
F	do/du	na	ke/ki	?	ha	?	ba
3	?	?	sa	ya	ka	ka	e/i
F	ya	?	la	?	ka	ka	ga
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
F	?	*	?	ne/ni	ma	no/nu	de/di
5	ke/ki	ta	sa	na	ma	ba	sa
F	ke/ki	?	la	na	ma	ba	la
6	ba	ga	ka	bo/bu	nga		
F	ba	da	ke/ki	bo/bu	?		

Table 7: Comparison with Francisco's Results (F=Francisco)  
(\*Missing symbol in Francisco's diagram. Cf. Santos 1996a)

	1	2	3	4	5	6	7
1	e/i	na	bi/be	sa	ka	ta	
P	a	na	bi	la	ka	da	
2	go/gu	na	ke/ki	ta	pa	ya	ba
P	ngu	na	ki	da	ha	ga	ba
3	?	?	sa	ya	ka	ka	e/i
P	ya	wa	la	ga	ka	ka	a
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
P	ta	*	ga	ni	ma	nu	ngi
5	ke/ki	ta	sa	na	ma	ba	sa
P	ki	ta	la	nu	ma	ba	la
6	ba	ga	ka	bo/bu	nga		
P	ba	nga	ki	bu	pa		

Table 8: Comparison with Potet's Results (P=Potet)  
(\*Missing symbol in Potet's transcription which was borrowed from Francisco. Cf. Santos 1996a)

		1	2	3	4	5	6	7
1	P	a	na	bi	la	ka	da	
	F	ga	na	bi/be	la	ka	?	
2	P	ngu	na	ki	da	ha	ga	ba
	F	do/du	na	ke/ki	?	ha	?	ba
3	P	ya	wa	la	ga	ka	ka	a
	F	ya	?	la	?	ka	ka	ga
4	P	ta	*	ga	ni	ma	nu	ngi
	F	?	*	?	ne/ni	ma	no/nu	de/di
5	P	ki	ta	la	nu	ma	ba	la
	F	ke/ki	?	la	na	ma	ba	la
6	P	ba	nga	ki	bu	pa		
	F	ba	da	ke/ki	bo/bu	?		

Table 8: Comparison of Potet's and Francisco's Results (P=Potet; F=Francisco)

	1	2	3	4	5	6	7
1	e/i + na		be/bi + sa		ka + ta		
2	go/gu + na		ke/ki + ta		pa + ya + ba		
3	?	?	sa + ya		ka	ka	e/i
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	ke/ki + ta		sa + na		ma + ba + sa		
6	ba + ga + ka			bo/bu + nga			

Table 9: Proposed Combination/Grouping of Syllables

	1	2	3	4	5	6	7
1	i + na		bi + sa		ka + ta		
2	gu + na		ki + ta		pa + ya + ba		
3	?	?	sa + ya		ka	ka	e/i
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	ki + ta		sa + na		ma + ba + sa		
6	ba + ga + ka			bu + nga			

Table 10: Proposed Choices of E/I and O/U

	1	2	3	4	5	6	7
1	i + na		bi + sa		ka + ta		
2	gu + na		ki + ta		pa + ya + ba		
3	?	?	sa + ya		ka	ka	e/i
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	ki + ta		sa + na		ma + ba + sa + h		
6	ba + ga + y + ka + n			bu + nga			

Table 11: Proposed Additions of Consonants

	1	2	3	4	5	6	7
1	ina		bisa		kata		
2	guna		kita		payaba		
3	?	?	saya		ka	ka	e/i
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	kita		sana		mabasah		
6	bagaikan			bunga			

Table 12: Final Forms of the Words

	1	2	3	4	5	6	7
1	ina		bisa		kata		
	<i>mother</i>		<i>can</i>		<i>say</i>		
2	guna		kita		payaba		
	<i>for/use</i>		<i>we/you</i>		<i>cherished one/child</i>		
3	?	?	saya		ka	ka	i/e
			/				
4	?	?	ya	ne/ni	ma	no/nu	ge/gi
5	kita		sana		mabasah		
	<i>we/you</i>		<i>there [di +]</i>		<i>to get wet</i>		
6	bagaikan			bunga			
	<i>like a</i>			<i>flower</i>			

Table 13: Word-for-Word Translation into English

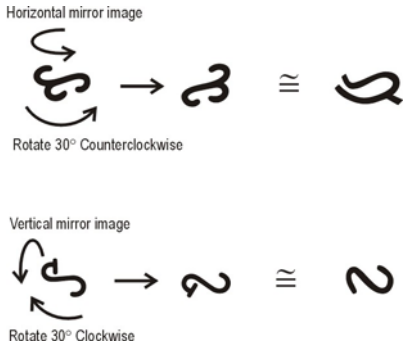


Fig. 3: Mirror Writing Examples

Strong (4)				Moderate (4)				Weak (3)			Unknown (2)		
⓪	Ɔ	Ⓜ	Ⓝ	Ⓢ	Ⓚ	ⓖ	ⓔ/Ⓦ	Ⓟ	Ⓨ	Ⓝ	Ⓡ	Ⓢ	Ⓣ
BA	KA	MA	NA	SA	KA	GA	E/I	PA	YA	NGA	A, O/U, DA, HA, LA, RA, WA		

Table 14: Three Degrees of Probability

	a	e/i	o/u	ka	ga	nga	ta	da	na	pa	ba	ma	ya	la	wa	sa	ha
Calatagan		ɾ		ɸ	ɸ	ɸ	ɸ		ɸ	ɸ	ɸ	ɸ	ɸ			ɸ	
Tagalog (1)	ɾ	ɸ	ɸ	ɸ	ɸ		ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ		ɸ	ɸ
Tagalog (2)	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Ilokano	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ		ɸ	
Bisaya	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Pangasinan	ɾ	ɸ	ɸ	ɸ	ɸ		ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Pampango	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ		ɸ		ɸ	
Bikol	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Mangyan	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Tagbanuwa	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ
Batak (Sumatra)	ɾ	ɸ	ɸ	ɸ	ɸ		ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ		ɸ	ɸ
Bugis (Sulawesi)	ɾ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ	ɸ

Table 15: Comparative Table of Syllabaries

(Tag. (1), Tag. (2), Ilk., Bis., Pang. and Pam. from Pardo de Tavera (1884), Tagb. and Mang. from Francisco (1973). Batak and Bugis from Coulmas (1996).)

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