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SIDDHAM ACROSS ASIA: HOW THE BUDDHA LEARNED HIS ABC

RICHARD SALOMON



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Siddham across Asia: How the Buddha Learned his ABC

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1. Introduction: The dvādaśākṣarī, the *siddham* system, and the Siddhamātrkā script

In this paper I will explore the techniques by which young students learned to write in ancient India and in the Indianized Buddhist cultures of Central Asia, and demonstrate how these techniques ultimately even influenced the written traditions of Buddhist East Asia. My observations will be based primarily on archaeological materials, that is, surviving specimens of Buddhist manuscripts and inscriptions which bear relevant texts. These archaeological sources will be supplemented by a selective use of East Asian textual materials, including first-hand reports by Chinese Buddhist pilgrims about writing and education in ancient India and Chinese Buddhist texts describing Indian writing practices.

Here, as is so often the case with the study of the realia of ancient Indian culture, the best information comes from outside, and this for two reasons. First, the monsoon climate in a short time destroys all documents written on organic materials such as palm leaves, birch bark, or paper, so that ephemera which were not carefully preserved and regularly copied are invariably lost. Secondly, the dominant literary cultures of classical India placed little emphasis on practical and ephemeral matters, preferring to concentrate on theoretical, abstract and philosophical issues, with the result that the realia of both public and private life were rarely preserved or reported, unless they happened to be recorded in the form of inscriptions on durable materials such as stone or metal.

As a result, we have very little direct evidence from India itself as to the methods of teaching literacy in ancient times. Our information is limited to a few stone statues that portray school scenes, and these will be the main focus in the first part of this paper. But the situation is quite different when we turn to the Indianized Buddhist cultures of Central Asia. Here, among the silk road oases along the northern and southern rims of the Tarim Basin (in the modern Xinjiang-Uighur Autonomous Region of the People's Republic of China, that is, what used to be called 'Chinese Central Asia'), around the beginning of the nineteenth century explorers from Europe and Japan found an enormous wealth of manuscripts in Sanskrit and other Indian and local languages, far older than any manuscripts that had been found in India proper. Among these manuscripts were numerous fragments of both teachers' models and students' exercises for writing the Indian alphabets¹ with their complex syllabic combinations, and these precious scraps will be the centerpiece of the later parts of this article.

The best-known documentary evidence about elementary education in literacy in early India is a small (about 3 inches high) terracotta statuette of a chubby little boy which was found at Sugh (ancient Srughna) in the Ambala District of the Indian state of Haryana, and is now in the National Museum, Delhi.² In figure 1 we see the boy writing out the beginning of the alphabetic sequence of the Brāhmī script, which is the archetype of all the many later scripts of India. Judging by the form of the characters, this piece can be attributed to around the Śuṅga period, that is, approximately the second or first century BCE. For reasons which will be explained later, I take this to be a portrait of the boy on his first day at school. He is pointing with his right hand to the letters which he has written, no doubt reading them aloud,

1 In this article I use the term 'alphabet' in a non-technical sense, referring to the repertoire of the basic graphs of Indian scripts (*a ā i ī u ū ... ka kha ga gha ṅa* etc.), which, technically speaking, represent syllables rather than 'alphabetic' characters (that is, phonemes). The term 'syllabary' will, in contrast, be applied to the sets of syllabic combinations (*ka kā ki kī ku kū* etc.) of the basic graphs.

2 The sculpture has been discussed and illustrated in many publications, including Agrawala 1969; Chhabra [no date], 1975, and 1986; and Ahuja 2002: 48–50.



Fig. 1. Sugh terracotta showing a young boy learning to write.

while with his left hand he grips the handle of a writing board or *takhti* of the kind which was traditionally used in the northwestern part of the Indian subcontinent in antiquity, and which is still used there today. As we will see later, actual archaeological specimens of such objects have been discovered in Central Asia.



Fig. 2. Modern Pakistani boy learning to write on a takhti.



Fig. 3. Sugh terracotta, with the writing board inverted and selected letters traced in red.

Fig. 3 shows the Sugh plaque with some of the more legible portions drawn in for clarity. Here it becomes clear that the text on the writing board consists of the vowels of the Brāhmī alphabet written out four times in four identical lines. Combining the most legible portions in lines 3 and 1, the repeated sequence can be read as [line 3] *a, ā, i, ī, u, ū, e, ai*, [line 1] *o, au, am, aḥ*. The boy is pointing with his right index finger to the letter *i* in the last line.

It has been reported that there are also ‘a few more contemporary terracottas of this type from Sugha itself ... letters therein present the consonants in one case and mixed letters in the other.’³ But as far as I have been able to determine, none of these additional plaques have been adequately published or illustrated, and they are reportedly now in private hands and inaccessible to scholars. N. Ahuja (2002: 57 n. 15) provides a more detailed description of these inscriptions, noting that ‘on one of them, it seems that although two lines are missing on the slate, the syllabary is complete from *a* to *sa*,’ and in an unpublished photograph of an object of this type which was provided to me by Professor Ahuja, part of the basic sequence of the consonants can be read at the end of the second line, apparently as ... *jha ṅa ṭa ṭha ḍa ḍha ṇa*. Some traces also survive of the letters at the end of the first line, but they cannot be clearly made out. Thus this piece might have originally contained the complete alphabet, like the one mentioned by Ahuja, but this cannot be confirmed from the materials currently available to me.⁴

Thus, despite the inadequate documentation, there is sufficient evidence to confirm that the various Sugh terracottas contained different alphabetic sequences, including both the vowels and the consonants. And if Agrawala’s

3 Agrawala 1969: 358; Shastri (1985: 75) refers to fourteen such objects. One such piece is illustrated by Ahuja (2002: 49, fig. 2), but the inscription is not legible there.

4 Ahuja also points out (2004: 55) that one of these ‘child-scribe’ figures is in the collection of the Boston Museum of Fine Arts, where it has however been misidentified by Ananda Coomaraswamy and others following him as a ‘female deity’ (Paulson 1977: 37–38, no. 53; Poster 1973: no. 34). I was able to study this piece in March 2016 and to confirm Ahuja’s correction of the subject, but unfortunately no trace of the writing which should have originally been on it is preserved.

description, cited above, of other ones with the ‘mixed letters’ is correct, this would presumably mean that there were also examples containing the various consonant plus vowel combinations (*ka k̄a ki k̄i ku k̄ū*, etc.). However this may be as regards the details, these sequences of vowels and consonants will be familiar to anyone who has studied Sanskrit or other Indian languages, as it is the first part of what is traditionally known in Sanskrit as the *dvādaśākṣarī*, or in north Indian vernaculars as *bārākhadī* or *bārasakhadī*, that is, ‘the twelve syllables’ (Bühler 1898: 29).

The terms *dvādaśākṣarī* etc. refer to the twelve vowel signs (*a, ā, i, ī, u, ū, e, ai, o, au, aṃ, and aḥ*) which are first written and recited by themselves and then combined with each of the following 34 consonants (*ka k̄a ki k̄i ku k̄ū* etc.; *kha kh̄a khi kh̄i khu kh̄ū* etc.), with each consonant series constituting another set of twelve syllables (*akṣara*). The absence of the three (or four) liquid vowels (*ṛ, ṝ, ḷ, and sometimes Ḹ*) from this list may seem surprising to Sanskritists, but this can be explained on the grounds that the Brāhmī script was originally developed not for Sanskrit but in connection with Prakrit, which lacks these vowels.⁵ The retention right down to modern times, both in and beyond India, of the *dvādaśākṣarī/bārākhadī* sequence for writing instruction, despite its inadequacy for writing Sanskrit, is probably a reflection of the conservatism that is typical of elementary pedagogy everywhere: the first thing learned is the last to be forgotten.

5 See Bühler 1898: 31–35. A Brāhmī sign for vocalic *ṛ* does not appear until the early centuries of the Common Era (Salomon 1998: 37), when the script was being adapted for Sanskrit. But if the absence of the liquid vowels is attributable to the originally Prakrit context of Brāhmī script, it may also seem strange that the *dvādaśākṣarī* does include the vowels *ai* and *au*, which are normally found only in Sanskrit. It may be relevant that *ai* (in its post-consonantal form) does occur several times in the Girnar version of the Aśokan inscriptions, so that the long diphthongs (*ai, au*) might be said to have had some marginal existence in Prakrit. Alternatively, we might suppose that the *dvādaśākṣarī* system originated at a transitional period when Brāhmī script was still being adapted to Sanskrit. At this point the syllabic vowels *ṛ, ṝ*, etc. were probably still represented as *ri, rī*, etc., as indeed they are often seen even in later inscriptions. For example, even in the ornate Sanskrit inscription in honor of Samudra Gupta at Allahabad, datable to the late fourth century CE, we still find *prithivyām* instead of *ṛthivyām* (Salomon 1998: 95).

In the *dvādaśākṣarī* system, a complete syllabary would consist of the 34 consonants⁶ each written out with its twelve vocalic combination forms. This basic pattern would then be further elaborated with various sets of consonantal conjuncts (the consonants plus *y*, consonants plus *r*, etc.), each of which would again be written out with the twelve vocalic variations (*kya kyā kyī ... khya khyā khyi* etc.), with each set written out as a separate chart or table. These *dvādaśākṣarī* charts were traditionally headed with the auspicious word *siddham* ('[May it be] complete' or '... successful'), so that the syllabic system as a whole came to be known as *Siddhamāṭṛkā*, 'siddham matrix' or more formally *Siddhākṣarasamāmnāya*, which was rendered by Bühler as 'the alphabet, preceded by the word *Siddha* (success)' (1898: 30).

However, the terms *siddham* and *Siddhamāṭṛkā* later came to be applied not only to the system of syllabic arrangement, but also to a particular local but highly influential script form which was current in northern India around the second half of the first millennium CE. Although the use of the term *Siddhamāṭṛkā* is not documented in Sanskrit texts themselves,⁷ we do have for this the usually reliable testimony of Al-Bīrūnī, who tells us that in his time, namely the eleventh century AD, 'the most generally known alphabet is called *Siddhamāṭṛkā*, which is by some considered as originating in Kashmir But it is also used in Varānaśī.... The same writing is used in Madhyadeśa'

6 The thirty-fourth consonant is *kṣ*, which, though historically a conjunct of *k* and *ṣ* rather than a primary grapheme, gradually developed into a distinct ligature whose original component elements were obscured so that it came to be considered as an independent consonant.

7 Van Gulik (1956:53–54) notes that 'Since *siddham* as the name of a script does not, as far as I know, occur in Sanskrit literary sources, it must have been a popular designation that did not find its way to classical Sanskrit.' This is not surprising, for Sanskrit texts, with rare exceptions, have very little to say about script varieties and their names; this, in contrast to the abundant information which is provided about languages and dialects. This pattern reflects the idea, pervasive in the Sanskritic tradition, that it is the spoken rather than the written form that embodies the essence of the language. In this respect, the Indian view of the relationship between spoken and written language was the diametric opposite of that which prevailed in China, where the written characters were considered as the essential form of the language. This, as shown by van Gulik (1956; esp. pp. 13, 22, 36–39), led to fundamental misunderstandings on the part of Chinese Buddhist scholars as to the nature of Indian writing and language.

(Sachau 1914: 173). This north Indian *Siddhamātrkā* script – itself derived from the old Brāhmī which we have seen on the Sugh terracottas – was of prime importance in the history of writing in Asia. It was the direct ancestor, not only of the modern Devanāgarī and several other modern north Indian scripts, but also of the Tibetan and other central Asian scripts.

Moreover, *Siddhamātrkā* was also the archetype of the Buddhist ritual script which came to be known in East Asia as *Siddham* (Chinese *xītán* 悉曇). The highly calligraphic quality of *Siddham* can be traced back to the decorative elaboration often seen in Indian *Siddhamātrkā*, which stands out in this regard among the Indian scripts, which for the most part are not highly embellished.⁸



Fig. 4. Specimen of North Indian *Siddhamātrkā* Script: The Kārūtalai inscription of Lakṣmaṇarāja (841-842 CE). *Epigraphia Indica* 23: plate facing p. 260.

The *Siddham* script was widely used in China and Japan for writing the mantras and *dhāraṇīs* of esoteric Buddhism, and thereby came to embody a calligraphic tradition which still flourishes today. It thus represents, in a

⁸ On calligraphy in India in general, see Salomon 1985, and pp. 3–4 on calligraphic forms of *Siddhamātrkā* in particular.

sense, the culmination and ultimate development of the Indian *Siddhamātrkā* tradition. The study of East Asian *Siddham* is a vast field in itself, which I will address only briefly in section 4 of this article, in connection with my main subject, namely the function of the *Siddham/Siddhamātrkā* systems in India and in Indianized Central Asia in teaching students how to write.

2. An alternative Indian system: The Kharoṣṭhī script and the *Arapacana* alphabet

Before returning to the *siddham/dvādaśākṣarī* system and its long and wide subsequent history in the development of writing in the Buddhist world, I first turn to the northwestern hinterlands of the Indian subcontinent, that is, to ancient Gandhāra, which presents some particularly interesting archaeological material about writing pedagogy in antiquity. Between the third century BCE and the third century CE, while the Brāhmī script was being used throughout the rest of the Indian world, in the northwestern sector of the subcontinent an entirely different script system prevailed. This script, known as Kharoṣṭhī, differed from Brāhmī not only in having a completely different set of characters and a partially different system of vowel notation, but also an entirely independent alphabetical ordering system. This ordering principle has been determined thanks to images such as the one shown in fig. 5:



Fig. 5. *The Buddha's first day at school*

This scene depicted in this sculpture⁹ has long been recognized as the legend of ‘the demonstration in the writing school,’ as recorded in the *Lalitavistara*.¹⁰ The story describes the bodhisattva Siddhārtha Gautama’s first day at school, when he showed the school master that he not only already knew the Kharoṣṭhī and Brāhmī scripts, but also 62 other scripts which neither the schoolmaster nor anyone else has ever heard of.

What is remarkable about this, and also a few similar Gandhāran depictions of this scene, is that one of the writing boards shown in it contains a miniature inscription, as shown in fig. 6:



Fig. 6 (detail of fig. 5). The Arapacana alphabet on the future Buddha’s writing board: a ra pa ca na la da [ba]

For many years the text on these writing boards remained obscure, and various contrived and unconvincing interpretations were proposed for it. But it is now firmly established on textual and archaeological grounds that the sequence of syllables on the writing boards was nothing other than the original order of the Kharoṣṭhī alphabet,¹¹ which is known as *Arapacana* from the sequence of the first five syllables (*a ra pa ca na* etc.).¹²

9 Published in Salomon 1993.

10 *Lipiśālāsamdarśana*; pp. 123–128 of S. Lefmann’s 1902 edition.

11 See Salomon 1990 and Salomon 2006.

12 A problem that remains to be solved is the logic – if any – that underlies this

It is therefore now clear that the inscription on the writing boards in these school scenes represents the students' first-day exercises in learning to write Kharoṣṭhī script. This brings us back to the Sugh terracottas, and leads one to wonder whether they too represent, not just any little boy, but none other than the bodhisattva, that is, the future Buddha, on his first day of school.¹³ The only material difference between the two scenes is that at Sugh the text is represented by the local Brāhmī script in its standard *siddham* ordering, while the Gandhāran pieces show the Kharoṣṭhī *Arapacana* which was current in the northwest.¹⁴

Direct archaeological parallels to these objects have been provided by the discoveries at the famous Niya site, on the southern silk road in Xinjiang. Among the many hundreds of mostly administrative and legal documents discovered at Niya, written in Kharoṣṭhī script on wooden tablets, document no. 512, found at ruin N. XXIV, stands out as unique.¹⁵

Arapacana order. In contrast to the order of Brāhmī script and its many derivatives, which is systematically motivated by phonetic relationships (as in the sequence *ka kha ga gha ṅa*, etc.), the *Arapacana* has no discernible internal logic, nor does it resemble any other known systems of alphabetical order (Salomon 2013: 15–16).

13 B.Ch. Chhabra cites C. Sivaramurti's suggestion that the figure 'represents *Kṛishṇa* as a child at the *Lipiśālā* in the hermitage of his teacher, Sāndīpani, at Avantipura' (n.d.: 14). However, according to the account of his life in the *Bhāgavata Purāna* (10.45.31ff.), Krishna did not encounter Sāndīpani until he was a full-grown young man, after he had sported with the *gopīs* and slain *Kaṃsa*. That guru is described as teaching Krishna the Vedas and the various sciences, and there is no reference to elementary literacy. Ahuja (2002: 49–50) also expressed doubts about Sivaramurti's identification on stylistic grounds, and cited strong evidence for a Buddhist presence at the Sugh site (p. 47).

14 If the Sugh terracottas do represent the future Buddha, they would be among the earliest – conceivably even *the* earliest – representations of the bodhisattva/Buddha in Indian art. I hesitate to make any far-reaching claims about this highly controversial topic, especially in light of the imprecision of the date attributed to the terracottas on paleographic grounds; but the matter may still deserve consideration by the relevant specialists. The identification of the figure as the young bodhisattva is admittedly less than certain, but my confidence in it was boosted when I learned that Ahuja had come to the same conclusion independently, as he informed me in personal communication.

15 This piece was originally published in Boyer, Rapson and Senart 1920–27: part 2, 187, and is discussed in detail in Thomas 1950 and Salomon 1990: 265–268.



Fig. 7. Niya document 512: The Arapacana (Kharoṣṭhī) alphabet on a writing board (*takhti*) from Niya (Xinjiang)

This is the central part of a rectangular wooden board, both ends of which are broken off. The surviving middle portion contains the 16th through 35th syllables out of the 42 letters of the complete Arapacana or Kharoṣṭhī alphabet, written in an unusually calligraphic style with long flourishes at the bottom of each letter. The extant part of the *takhti* is about 16 cm in length, so that the complete original object would have been about twice as long, that is, some 32 cm.

A clue as to the function of this unique document is provided by another unusual document (no. 510),¹⁶ which was discovered in the same structure at Niya site N XXIV.



Fig. 8. Niya document 510

Unlike the vast majority of Niya documents, this too is not a secular administrative record, but rather contains a series of Buddhist verses corresponding to those at the conclusion of the *Prātimokṣa-sūtra* in the Dharmaguptaka version.¹⁷ But unlike the Arapacana tablet, is it complete and well preserved, revealing the *takhti* format with its handle with a hole for hanging on a hook, as we have seen in the sculptures from Sugh and from Gandhāra. In light of this, we can be confident that the incomplete Niya Arapacana tablet was also originally a similarly configured *takhti*.

16 Boyer, Rapson and Senart 1920–27: part 2, 184–185 and plate VII.

17 See Bernhard 1970: 59.



Fig. 9. Niyā building XXIV as seen by M. Aurel Stein in 1906

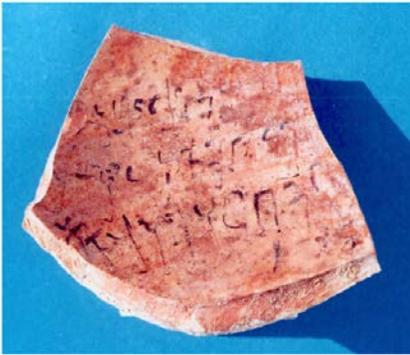
Furthermore, Niyā building XXIV contained several other unusual documents, including a huge wooden board, almost a meter in length, which also contained Buddhist texts instead of the usual official records. Evidently something was going on in this building that was different from the other structures at Niyā, which yielded nothing but humdrum administrative and legal documents, sometimes in massive numbers. On the basis of the unusual material found there, Mariner Padwa has very plausibly identified that ruin XXIV as ‘the residence of a scribal community with monastic affiliations’ (1999: 36).

Thus we have at Niyā site XXIV something we could never dream of finding in India: the actual remains of an ancient scriptorium, with concrete specimens of the work carried out there. That is to say, we have actual objects of the type which were secondarily depicted in the statues from Sugh and Gandhara. In the ornate *Arapacana* alphabet on the *takhti* board (Niyā 512) we even have what was probably a teacher’s model which the students were taught to imitate.¹⁸

Another relevant artifact has recently been discovered at the Buddhist monastic site of Kara Tepe near Termez, Uzbekistan, on the northern bank of

¹⁸ Formerly (Salomon 1990: 268) I interpreted Niyā 512 as a student’s exercise, but in light of subsequent discoveries and comparisons I now think that it must be a teacher’s model.

the Amu Daryu (Oxus) River. Here, as at Niya hundreds of kilometers to the east, we are far beyond the borders of the Indian heartland, but here too we find an artifact from an Indianized Buddhist civilization of a sort which is never found in the Indian homeland. The artifact in question is a fragment of a student's abecedary in Kharoṣṭhī, this time not on wood or stone, but on a clay ostrakon, dating from about the first or second century CE (Salomon 2004).



*Fig. 10. Arapacana abecedary on a potsherd from Termez.
Line 1 reads ... pa ca na la da ba ḍa*

The ostrakon contains only the first 27 of the 42 syllables of the *Arapacana* alphabet, but the layout of the letters shows that it was written after the pottery vessel from which the ostrakon came was already broken, and that the alphabet was never completed for lack of sufficient space. This is especially clear from the way the last letter *cha*, at the left side of the third line, has been squeezed in at the edge. Thus what we have here is a casual student's exercise on a scrap writing surface, in contrast to the *Arapacana* board from Niya, which seems to have been a teacher's model.

Also noteworthy, from an Indologist's point of view, is the material on which it was written. For the use of potsherds as a writing material for ephemeral records, though exceedingly common in other parts of the ancient world, especially in the Near East and the Hellenistic world, is virtually unknown in the Indian subcontinent itself.

The history of the Kharoṣṭhī script and the Gāndhārī language that it recorded is a fascinating one, but also one that ultimately leads to a historical dead end. With shifts in the centers of power that began in the third century CE, Gandhāra ceased to be a dominant region and was subordinated, at various periods, to the powers that arose to the west in Iran or to the east in India. This new historical dynamic led to the decline and complete disappearance of the Kharoṣṭhī script by the fourth century CE. Yet the Kharoṣṭhī script did have a lasting legacy in the form of its *Arapacana* alphabetical sequence. To understand this, we have to return to the story of the future Buddha's first writing lesson as described in the *Lalitavistara*. There, after his amazing display of knowledge of different scripts, he guided with his supernatural powers the other students' recitations of the alphabet in such a way that they were inspired to utter for each letter a word or phrase beginning with that letter which illustrated a basic Buddhist concept or principle. For example, after reciting the syllable *a*, they said the word *anitya*, 'impermanent'; after *ā*, *āmaparahita*, 'benefit to one's self and others'; after *i*, *indriyavaikalya* 'the deficiency of the organs of sense'; and so on. Here, the Sanskrit text of the *Lalitavistara* as we have it follows the standard Indic alphabetic order (*a ā i ī u ū ... ka kha ga gha* etc.) that is used in all of the Brāhmī-derived scripts. But as was shown by John Brough (1977), the first Chinese translation of the *Lalitavistara*, by Dharmarakṣa in 306 AD, reflects an original Indic text in which the words uttered by the students follow the *Arapacana* order, rather than the Brāhmī sequence.

This discovery led Brough to conclude that 'Dharmarakṣa's old *Lalitavistara* was translated from a Gāndhārī version' (p.94) in which the mnemonic words and phrases uttered by the students under the Bodhisattva's inspiration were ordered in the *Arapacana* sequence of the Kharoṣṭhī alphabet. The extant Indic version of the *Lalitavistara*, according to this theory, is a Sanskritized text in which the recitation scene has been reworked to follow the alphabetic sequence of the Brāhmī script family. But many other Buddhist Mahāyāna texts preserved in Sanskrit, Tibetan, and/or Chinese, for example the *Prajñā-pāramita* sūtras, contain mnemonic formulae based, like

the one in the original *Lalitavistara*, on the *Arapacana* ordering.¹⁹ Eventually, *Arapacana* even came to be personified as a manifestation of the Buddha Mañjūsri.²⁰ But by this time, the original function of *Arapacana* as an alphabetic sequence had been completely forgotten, only to be rediscovered in the modern era.

19 See Salomon 1990: 255.

20 Banerjee 1947.

3. A Brief excursus: Some notes on writing pedagogy in the ancient world

Before turning to the further history of the teaching of the Indian alphabets beyond their homelands, I will offer a few remarks by way of a cross-cultural study of writing pedagogy in the ancient world. One might naturally assume that the Indian method of teaching writing by means of combinatory sets of syllabic units – that is, by the *dvādaśākṣara* or *siddham* system – was directly conditioned by the nature of the Indian scripts, in which the graphic unit is a syllable consisting of a vowel, or more frequently of a consonant or a cluster of consonants plus a vowel, rather than a single phoneme, either vowel or consonant, as in alphabetic scripts. Such an assumption would be correct in and of itself, and indeed one could hardly imagine that any other mode of instruction in literacy would have arisen in the Indian context. But it is nonetheless interesting to note that even in cultures which use alphabetic systems of graphic notation, syllabic units were regularly used in writing lessons as an intermediate step between learning the alphabet and writing actual words.²¹ From imperial Rome, for instance, we have Quintilian's description of early childhood pedagogy:

21 The cross-cultural preference for syllabic pedagogy can be understood in terms of the naturalness of the syllabic unit. Linguists generally agree that the syllable, rather than the phoneme or 'letter,' is the minimal unit into which persons tends to intuitively segment words; in the words of John de Francis, for example, 'There can be little doubt that it is easier to conceptualize a syllable than to analyze utterances into their smaller phonemic units' (1989: 67).

As regards syllables, no short cut is possible; they must all be learnt, and there is no good in putting off learning the most difficult; this is the general practice, but the only result is bad spelling. Further we must beware of placing a blind confidence in a child's memory. It is better to repeat syllables and impress them on the memory and, when he is reading, not to press him to read continuously or with greater speed, unless indeed the clear and obvious sequence of letters can suggest itself without its being necessary for the child to stop and think. The syllables once learnt, let him begin to construct words with them and sentences with the words.²²

From the Greek-speaking world, we have an interesting fragment of an actual specimen of such a syllabic exercise on an ostrakon from Oxyrhynchus,²³ in which each line contains one consonant in syllabic combinations with each of the vowels; for example, the tenth surviving line reads $\pi\alpha\ \pi\epsilon\ \pi\eta\ \pi[\iota]$ ///. But in the following line, $\rho\alpha\ \rho\epsilon\ \rho\eta\ \rho(*\iota)$ ///, the third syllable, $\rho\eta$, has been corrected from an originally written $\rho\epsilon$, which the student had repeated in error from the preceding syllable. As we will see below, this sort of ditographic error is also seen, quite frequently, in Indic syllabaries.²⁴

Another feature of the ancient Indian pedagogical system that is shared elsewhere is the combinatory technique whereby various combinations of letters, including those which never occur in ordinary usage or even are

22 Institutes of Oratory I.1.30–31; translation from Butler 1953: 35–37. [XXX] Syllabis nullum compendium est: perdiscendae omnes nec, ut fit plerumque, difficillima quaeque earum differenda, ut in nominibus scribendis deprehendantur. [XXXI] Quin immo ne primae quidem memoriae temere credendum: repetere et diu inculcare fuerit utilius, et in lectione quoque non properare ad continuandam eam vel accelerandam, nisi cum inoffensa atque indubitata litterarum inter se coniunctio suppeditare sine illa cogitandi saltem mora poterit. Tunc ipsis syllabis verba complecti et his sermonem conectere incipiat.

23 British Museum 1929: 206, fig. 225.

24 Several such errors are found in the Central Asian syllabary published in Vorob'ev-Desjatovskij 1958: 281–287 (discussed in section 5 below), where for example the scribe wrote the syllable *mu* twice instead of *mu mū*, and again in the next line, *yu yu* for *yu yū*.



Fig. 11. Greek syllabic exercise on an ostrakon from Oxyrynchus (Egypt). In line 11, ρα ρε ρη ρ(*ι), the third syllable has been corrected from ρε to ρη.

phonetically impossible, are learned by way of mnemonic exercise.²⁵ We find a partial counterpart to this phenomenon in the split alphabet which is occasionally seen in Latin graffiti, for example on one from Pompeii²⁶ which reads:

a x b u c t
d s e r f q g p h
o i n k m l

Here a student has been taught to write a split alphabet with the letters alternating between the beginning in the normal direction and the end in reversed order sequence: thus *a - x - b - u - c - t*, etc. (The early Roman alphabet lacked the letters *y* and *z*.)

²⁵ Examples of these techniques are discussed below in section 6.

²⁶ Corpus Inscriptionum Latinarum IV, supplement pt. 2, # 5472 (1909).

This mnemonic technique can hardly fail to remind Indologists of the Vedic *vikṛtis*, that is, the various patterns of recitation of mantras (*jaṭā-pāṭha*, *ghana-pāṭha*, etc.) in which the individual words of the text are repeated in reversed pairs and in other more complex sequences, all designed to fix the text in the memory of the reciter and to guarantee the preservation of the sacred texts without variation or corruption. Although these techniques operate on a different and much more complex level, the underlying psychological effect is the same as that of the Roman split alphabet: the student fixes and reinforces the memory of a basic sequence by practicing it in variational patterns.

4. The *siddham* system in China and Japan: A preview

In order to understand and interpret the specimens of Central Asian syllabaries which will be discussed in some detail in the next section, it will be necessary first to briefly introduce the East Asian adaptations and expansions of the traditional Indian syllabic matrices. For it is only here, in the abundant textual material on *siddham* from China and Japan,²⁷ that the full system of syllabic charts, undoubtedly Indian in origin, is systematically and completely preserved. This East Asian material is therefore necessary for deducing the underlying systems which are fragmentarily represented in the Central Asian manuscripts.

The East Asian literature on *siddham* reveals that there existed at various points a wide variety of such systems. For example, the Japanese *siddham* master Annen 安然 mentions²⁸ various systems with eleven, twelve, thirteen, fourteen, or eighteen tables (*zhāng* 章),²⁹ and the summary chart in Mabuchi

27 This material is presented in detail in, among other sources, van Gulik 1956, Chaudhuri 1998, Zhou 2004, and Mabuchi 2006.

28 In 悉曇十二例 *Xītán shí-èr lì* ‘Twelve Rules of Siddham,’ text no. 2703 in the Taishō Buddhist canon (Taishō Shinshū Daizōkyō), vol. 84, p. 465a19–b16.

29 The Indian term underlying Chinese *zhāng* 章 ‘chapter’ or ‘section’ is not directly attested, but it might have been *varga* ‘series,’ *pāṭha* ‘recitation,’ or some synonymous word. In Tocharian, the tables are called *amok* ‘art, skill,’ a term used elsewhere to render Sanskrit *śilpa* (Couvreur 1965: 117–118). The reconstruction of *zhāng* as *siddhavastu* (Beal 1884: 78) was rejected by Takakusu (1896: 170 n.2), and is probably a misunderstanding of *siddhir astu*, ‘May there be success.’ This expression was mentioned by Yijing as an alternate equivalent to *siddham*, referring to the *siddham* tables (*Xián zhāng* 悉曇章; Takakusu, *ibid.*).

2006: 40 lists thirteen different East Asian *siddham* texts with tables ranging from nine to eighteen. But the most prevalent systems seem to have been those with twelve and eighteen charts. Xuánzàng, who studied and traveled in Central Asia and India between 629 and 645 CE, refers to the twelve-chart system as the usual mode of elementary education there.³⁰ This twelve-table system³¹ is not explained in detail by Xuánzàng himself, but a full description is provided by Huìlín 慧琳, a native of Kashgar, in his 一切經音義 *Yīqiè jīng yīnyì* (The Meaning of the Words of All the Sūtras),³² composed between 788 and 810 CE. In his commentary on the third section (品 *pǐn*) of the (Mahāyāna) *Mahāparinirvāṇa-sūtra*, he describes the twelve tables as follows:

1. The simple consonants plus their twelve vowel combinations (*ka kā ki ... kha khā khi ...*)
- 2–5. The consonants plus the semivowels *y*, *r*, *l*, and *v*, with their vowel combinations (*kya kyā kyī ...; kra krā kri ...; kla klā kli ...; kva kvā kvi ...*)
6. The consonants plus *s* and their vowel combinations (*ksa ksā ksi ... khsa khsā khsi ...*)
7. The consonants plus *h* and their vowel combinations (*k-ha k-hā k-hi ... kh-ha kh-hā kh-hi ...*)
- 8–12. The consonants plus the five nasals and their vowel combinations (*kṇa kṇā kṇī ... kṇā kṇā kṇī ... kṇa kṇā kṇī ... kma kmā kmi ...; khṇa ... khṇā ... khṇa, etc.*).

Thus each table (*zhāng* 章) would consist of 408 syllables (34 consonants with 12 vowel combinations each), and the entire set of twelve tables would have 4896 (408 x 12) syllables.

30 Beal 1884: 78; Watters 1904: 154–155.

31 The ‘twelve’ in *dvādaśākṣarī*, ‘twelve-syllable system’ is usually understood to refer to the twelve vocalic variants of each consonant, and not to the twelve syllabic tables of expansions of the basic *dvādaśākṣarī*. It is possible, though, that the popular twelve-table system was formulated with an intention to mirror the underlying twelve-vowel set.

32 T no. 2128, vol. 54, p. 471a3–6. The passage in question is discussed briefly in de Rothorn 1896: 283; cf. also Bühler 1898: 30 and Hoernle 1911: 451.

But Yìjìng, who travelled in India and Southeast Asia between 671 and 695 AD, only a few decades after Xuánzàng, reported that a system with eighteen sections was used in India to teach six-year old students to write in six months.³³ Like Xuánzàng, Yìjìng did not explain the details of this system, but it was definitively described in Zhìguǎng's 智廣 *Xītán zì jì* 悉曇字記 ('Notes on *Siddham* Letters'³⁴), as follows:

1. The simple consonants with their vowel combinations (*ka k̄a ki ... kha kh̄a kh̄i ...*)
2. The consonants plus *y* (*kya kyā kyī ...; khya khyā khyī ...*)
3. The consonants plus *r* (*kra krā kri...*)
4. The consonants plus *l* (*kla klā kli ...*)
5. The consonants plus *v* (*kva kvā kvi ...*)
6. The consonants plus *m* (*kma kmā kmi ...*)
7. The consonants plus *n* (*kna knā kni ...*)
8. *r* plus the consonants (*rka rkā rki ...; rkha rkhā rkhi...*)
9. *r* plus the consonants plus *y* (*rkya rkyā rkyī ...*)
10. *r* plus the consonants plus *r* (*rkra rkrā rkri ...*)
11. *r* plus the consonants plus *l* (*rkla rklā rkli ...*)
12. *r* plus the consonants plus *v* (*rkva rkvā rkvi ...*)
13. *r* plus the consonants plus *m* (*rkma rkmā rkmi ...*)
14. *r* plus the consonants plus *n* (*rkna rknā rkni ...*)
15. Homorganic nasal plus the consonants (*ñka ñkā ñki ... ñca ñcā ñci ...*)
16. The consonants plus *ṛ* (*kṛ khṛ gṛ ...*)
17. Miscellaneous consonant combinations (*ska skā ski ... skha skhā skhi ... dga dgā dgi ... dhga dhgā dhgi ... ñktra ñktrā ñktri ... vca vcā vci ...*)
18. Miscellaneous combinations, including geminates and various other types.

Whereas Zhìguǎng's brief text describes the eighteen tables with only representative examples for each set, the charts in Annen's *Shittan-zō* 悉曇藏 'Storehouse of *Siddham*' (T vol. 84, no. 2702, pp. 449-461), composed in 880 CE, spell out in *siddham* script the entire expanded repertoire of each set.

33 Takakusu 1896: 170–172.

34 T no. 2132, vol. 54, pp. 1186a3–1189c28. Zhìguǎng's eighteen-table system is described in detail in Chaudhuri 1998: 34–41.

A sample page from Annen's charts, showing the imposing repertoire of complex and unusual combinations, as shown in fig. 12:



Fig. 12. Charts from Annen's *Shittan-zō* 悉曇藏 :
End of table 10 ($r + \text{consonants} + r$), table 11 ($r + \text{consonants} + l$), and
beginning of table 12 ($r + \text{consonants} + v$)

5. The *siddham* system in Buddhist Central Asia

As was mentioned at the beginning of this essay, some of the best documentary evidence for the history of the *siddham*/*dvādaśākṣarī* and related pedagogical systems comes not from India itself but from the remains of the ancient oasis cities on the silk roads in the Tarim Basin along the fringes of the Taklamakan Desert. Here, among the thousands of manuscript fragments in Sanskrit and local languages such as Khotanese and Tocharian, many dozens of remnants of syllabary charts and students' exercises have been found at sites in and around Khotan on the southern silk road, Kucha on the northern road, and Dunhuang to the east. Such documents have been published with illustrations by pioneer scholars such as A.F.R. Hoernle (1911), F.W. Thomas (1954), V.S. Vorob'ev-Desjatovskij (1958), and Walter Couvreur (1967), and some two dozen specimens from the Khotanese-speaking regions are transcribed in Skjærvø 2002, without illustrations.³⁵ Here, only a few representative or particularly interesting specimens will be discussed; a comprehensive study of the entire corpus would be a demanding and somewhat tedious, but nevertheless worthwhile enterprise.

Few of these items can be dated with any precision, but it can reasonably be assumed that all or most of them fall within the range of the sixth to tenth centuries CE. As such, they provide us with the missing links between the poorly attested Indian originals and the highly developed and copiously

³⁵ These specimens can be located by referring to the heading 'Syllabaries' in the subject index (p. 609). Some of the items in Skjærvø 2002 had been previously edited by H.W. Bailey in various volumes of his *Khotanese Texts* (6 volumes, 1945–1967).

documented *siddham* system that arose during this period in China and which spread from there to Korea and Japan.

These Central Asian texts include syllabaries of varying length and complexity. Some are simple sets of the basic alphabet and numerical figures, while others evidently consisted of three charts, namely (1) the consonant plus vowel combinations, (2) the consonant ligatures with *y* and their vowel combinations, and (3) the ligatures with *r*, similarly expanded. But other fragments reflect more extended systems, typically comprising twelve or a similar number of charts and reminiscent of, though apparently not identical to, Huilín's twelve table system. The surviving texts include both carefully written pieces which seem to have been teacher's models and casual, incomplete, and often error-ridden specimens which must have been students' practice pieces.

Most if not all such syllable charts seem to have been used primarily for teaching Khotanese or Tocharian rather than, or in addition to, Sanskrit. This is evident from the inclusion in many of them of letters that were added to the original Indian phonetic repertoire to represent sounds of the Central Asian languages. Among the syllabaries from Khotanese speaking communities, this is apparent from the occasional addition of the sign for the supplementary vowel *ä*, as well as from the warnings to the lazy student which are often added at the end in Khotanese. The syllabaries from Tocharian communities on the northern road also add the vowel sign *ä* as well as the supplementary consonants ('Fremdzeichen') *wa*, *tsa*, and *ttsa*.

Several examples of syllabaries of the simpler types found scribbled on the blank backs of Chinese scrolls discovered at Dunhuang were published by A.F. Rudolf Hoernle in 1911 as the first known specimens of this genre. They include a chart of the basic alphabet (full vowels and the consonants) plus the numerical figures from 1/2 to 100,000 (1/2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, etc.), as shown in fig. 13³⁶:

36 Hoernle 1911: 455; re-edited in Skjærvø 2002: 528.

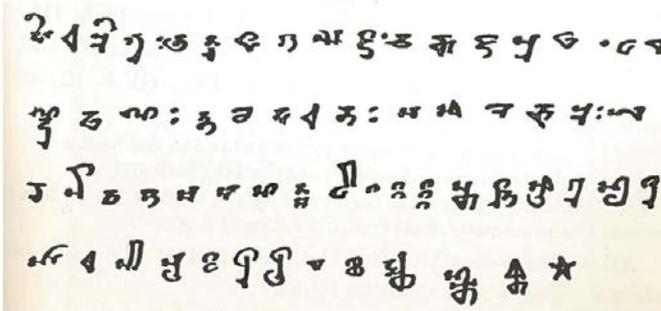


Fig. 13. Alphabet and numerals on a Dunhuang scroll

Another less successful rendition of the same set (fig. 14) shows the alphabet and the numerical figures, but only from 1/2 to 70, and with the figures for 60 and 70 reversed; evidently the author of this piece had not yet mastered the numbers.³⁷

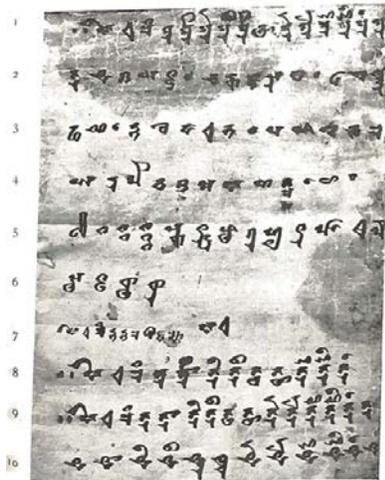


Fig. 14. First part of a student's siddham exercise from Dunhuang, showing the alphabet (lines 1-4), the numerals, and the beginning of the consonant + vowel combinations

This set of primary characters is followed in the same manuscript by the basic syllabic combinations of the consonants with each of the twelve diacritic vowels. After this come the conjuncts of each consonant plus *y* and their

37 Hoernle 1911: 454 and pl. I; re-edited in Skjærvø 2002: 528–529.

vocalic combinations (*kya kyā kyī...khyā khyā khyī... etc.*), and then a third syllabary with combinations of the consonants plus *r* following the same pattern (*kra krā kri... etc.*). This final set concludes with an imprecation in Khotanese³⁸ reading, according to Skjærvø's translation, 'Vaijalaka, (now) you apply your wits to it industriously and deeply! Don't ask for the stick and *beware of breaking the script! Welfare!'³⁹ Since these words of warning are immediately followed by another syllabary in a different hand, it is clear that this first set of three charts was felt to constitute a complete unit, rather than being an incomplete copy of one of the larger sets of twelve or eighteen charts. The existence of such a basic system comprising only the alphabet and three simple charts, which was presumably intended for beginners, is confirmed by several of the other items discussed below.

This exercise is immediately followed on the same roll by another one which is, in Hoernle's words (p. 457), 'exceedingly ill-executed and incomplete written by an illiterate person.' It comprises only the basic alphabet plus the simple consonant-plus-vowel sets, and this is completed only through the palatals, ending with ... *jho jhau jham* followed by a few more garbled letters, at which point the scribe apparently gave up. Another flawed beginner's specimen (p. 458) contains a basic syllabary in which the consonants *gha* and *jha* are written with the separate letters for *g* and *h* and for *j* and *h* respectively; evidently this student, like so many non-Indians who study Indian languages, struggled with the voiced aspirates. More surprisingly, in the following combinations of the base consonants and vowels, the syllables are written in a highly anomalous order which has only the vaguest resemblance to the normal sequence: *ka va ya kha ca la ysa ba ja*, and so on. And yet, strangely enough, Hoernle refers to 'a still smaller fragment of the

38 Though it was found in Dunhuang, far to the east of the Khotan kingdom, this and similar pieces represent the work of the Khotanese merchant community which was resident there. In the words of F.W. Thomas, they are 'obviously ... Khotanī in origin or inspiration' (1954: 692).

39 *vijālakā byamḍā nātsa uṣṣā hā yaṃṇā daula nā paja u āysāja gatcasti līka sadham* (Skjærvø 2002: 527). Bailey (1979: 385) reads and translates *vimjālakā byamḍā na tsa uvī hā yaṃṇā daula nā paja*, 'My boy, do not be stupid, apply your wits, do not ask for punishment.'

same roll' (not illustrated by him) in which 'the commencement of a syllabary in precisely the same peculiar order is repeated' (p. 458, n.1). Therefore we should not rule out the possibility that these pieces reflect some variant ordering which is not otherwise known to us.⁴⁰

Another Dunhuang scroll presents a particularly interesting illustration of the process of learning the alphabet. This scroll⁴¹ contains 113 lines in all, with alternating hands which Hoernle identifies as those of a teacher and one or more students. The text begins with 35 lines containing 'illegible scrawls, then very disorderly series of alphabetical radicals, omitting the cerebrals, but gradually improving.'⁴² The next 14 lines (36 to 49) contain a table of the basic characters and then a partial set of their vocalic combinations, but only through the combinations of *jha*, 'very carefully and calligraphically written ... evidently as a pattern, by the master, to be copied by the pupil.' In the following 43 lines (50 to 92) the student copied out the basic alphabet seventeen times, 'showing progressive skill ; at first more or less disorderly, afterwards ... in good order.' Lines 92 and 93 record a Chinese regnal date equivalent to 958 CE according to Skjærvø (2002: 533). The remaining 20 lines contain some further copies of the alphabet, 'less well done, perhaps by another pupil,' and then a final colophon by the teacher. In this document it is both interesting to see the *siddham* educational process in action and heartening to watch the young students' gradual progress.

Dunhuang was also the source of an outstanding specimen of what is evidently a teacher's pattern book, published by V.S. Vorob'ev-Desjatovskij.⁴³ This is a set of the first eleven leaves of a paper manuscript, in excellent condition, which contains the basic syllabary plus the first three syllabic charts; that is, the base consonants plus the vowels and the consonantal

40 These two syllabaries are also edited in Skjærvø 2002: 536–537.

41 Described in detail in Hoernle 1921: 1455 (Ch. c. 002) and edited in Skjærvø 2002: 530–532.

42 Skjærvø (2002: 531) queries whether the last twenty lines of this series might be by the teacher, rather than by the student as Hoernle believed.

43 1958: 281–287.

combination sets with *y* and *r* (the latter incomplete). The first page⁴⁴ opens with the word *saddham*, evidently the Khotanese equivalent of Sanskrit *siddham*,⁴⁵ followed by the basic vowel and consonant signs plus the numerals 1 to 100,000. At the end of this page is the warning in Khotanese, *sāja vaṭhāyā khu ma dām̐la na byehq*, rendered by Bailey as ‘Learn, servant, so that you do not get my stick!’⁴⁶

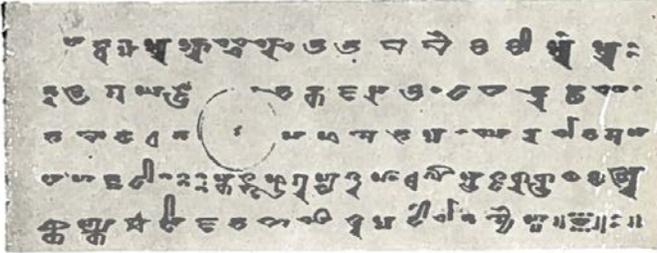


Fig. 15. Dunhuang *siddham* manuscript, folio 1b

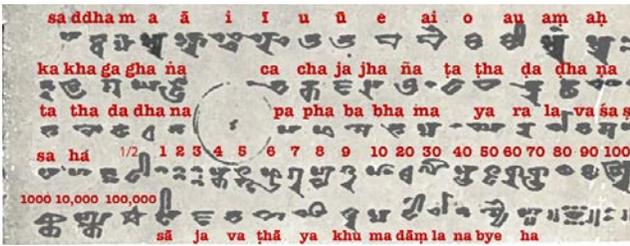


Fig. 16. Dunhuang *siddham* manuscript, folio 1b, with transcription

44 Folio 1b; 1a is blank.

45 According to Vorob'ev-Desjatovskij 1958: 281. See also Couvreur 1965: 114 n. 7, who proposes to read this as the normal *siddham*, but I am not convinced by his revised interpretation.

46 See Bailey 1979: 165 (s.v. *daula* ‘stick’) and 385 (s.v. *vijilaka* ‘boy’), where he gives two quite different translations for this phrase, which is also noted in Bailey 1963: 313 (no. 689, line 1b5). Compare the similar imprecation in another Dunhuang syllabary, cited above, as well as another one rendered by Skjærvø as ‘Learn quickly and thoroughly so that you may not receive the stick!’ (2002: 533; *sāja thyau netcūka khu dāla na byehā: ca*).

The text then continues in the normal fashion through the first three syllabic charts, each again headed by the auspicious word *saddham*. It ends on the eleventh folio with the vowel combinations of *śra*. The rest of the original manuscript would certainly have contained the remaining combinations of consonants plus *r* (*śra śrā* etc. through *kśra kśrā* etc.). We cannot be absolutely certain whether it ended on this lost twelfth folio or continued with one of the longer twelve- or even eighteen-syllabary systems, but in light of the evidence that we have seen above (and of further evidence to be presented below) for the frequent occurrence in Central Asia of a simpler three-chart model, it is more likely that this Dunhuang manuscript is missing only one folio and constituted a complete model set of the three basic syllabic charts, written out in twelve folios.

As observed by the editor,⁴⁷ several features of the present piece indicate that it must have been a teacher's model or pattern, and was thus comparable in function though not in physical form and content to the *Arapacana* board found at Niya. First of all, it is an independent manuscript in multiple numbered folios, in contrast to the other Dunhuang syllabaries which were written casually and often incompletely and incompetently on the blank parts of pre-existing Chinese scrolls. The careful arrangement and skillful handwriting of this manuscript (notwithstanding some minor errors, as noted below) point in the same direction. Each line comprises the vocalic combinations of a single consonant or consonantal conjunct, and each page consists of five lines, thus containing all the combinations for a single consonant *varga*. For example, folio 5b contains *kya, kyā, kyī...* through *nyau, nyam, nya*,⁴⁸ that is, the *y* combinations with the consonants of the velar group.

Despite the care with which this manuscript was evidently prepared, there are several minor errors—more than a dozen according to Vorob'ev-Desjatovskij's

47 Vorob'ev-Desjatovskij 1958: 283.

48 Throughout the text, the final vocalic combination for each consonant, simple or conjunct, is a repetition of the first syllable of the group/line, i.e. with the inherent vowel *a*, instead of the expected *visarga* combination as in most *siddham* texts (Vorob'ev-Desjatovskij 1958: 282).

interpretation.⁴⁹ In one case, in the third line of folio IVb, there is a series of errors: the scribe (a) skipped *lā*, then (b) inserted it after *lai*, (c) skipped *lau*, and (d) wrote *la* instead of *laṃ*.⁵⁰ Clearly he was having a tough moment here, and his troubles were not over yet; he then began the next line (4) with the first three letters of the *ś* sequence, skipping over the *ν* sequence entirely. But this time he realized his mistake and rectified it by pasting a slip over the erroneous portion and writing on it the correct syllables *va*, *vā*, *vi*.⁵¹ Although this correction slip itself is not clearly visible in the illustration in Vorob'ev-Desjatovskij's article, several black marks are discernible above and below the corrected letters, and I suspect these are artifacts of the correction. From this point on, however, there are only a few minor errors; perhaps the scribe took a much-needed rest after this misadventure.

The popularity of the simple three-chart system attested at Dunhuang is confirmed by eight small fragments of syllabaries from the Tocharian-speaking region around Kucha which were published by B. Pauly in 1962 without images, and re-edited with photographs by W. Couvreur in 1965. The best preserved specimens are the two fragments of Pauly's manuscript no. 2, which contain parts of the initial sequence of the simple consonants and their vowel combinations, and of the following sequences of consonants plus *y* and *r* with their vowel combinations (fig. 17).

49 See Vorob'ev-Desjatovskij's notes 8, 10–18 and 20. But several of these apparent errors involve the difficulty of distinguishing between the diacritic signs for *u* and *ū*, which are very similar in this script.

50 A further peculiarity in this line (not noted by Vorob'ev-Desjatovskij) is that the first syllable, *la*, has a wedge-shaped line across its upper stem, as if to cross it out, even though it is correct.

51 Vorob'ev-Desjatovskij 1958: 284 n. 17: «Три слога написаны на отдельно наклеенном листке, под ним – три начальных слога следующего ряда» ('Three syllables are written on a slip which was glued on separately; below them are the initial three syllables of the following series.')

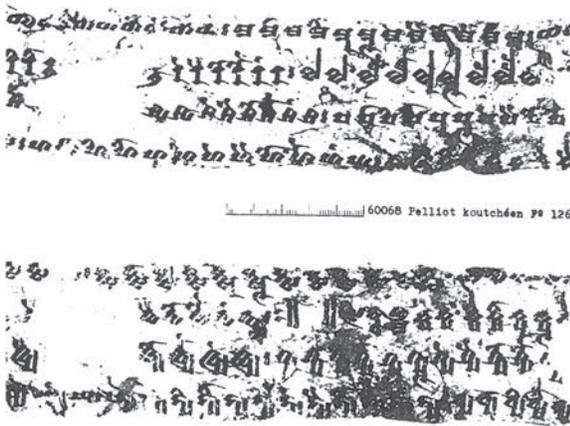


Fig. 17. Syllabary with basic consonant-plus-vowel characters and consonant combinations with *y*

One of the other fragments (no. 1) has only part of the initial list of consonants and their vowel combinations, while three others (3, 4, 5) preserve part of the initial listing followed by the consonants plus *y* and their vocalic combinations.⁵² The remaining fragment (6) contains part of the sequence of consonants plus *r*, from *(*jhra)ḥ tra* through *srai*. With regard to the possibility that this manuscript or any other of the Pelliot fragments originally contained further tables beyond these three basic ones, Pauly noted that ‘Les rubriques ultérieures, si elles existaient, ne sont pas représentées dans nos fragments’ (p. 594). But it is hardly likely to be a coincidence that all eight fragments include only the combination sets with *y* and *r*, and it is much more likely that all or most of these fragments, like the others described above, belonged to manuscripts which contained only these three tables, rather than the more elaborate twelve- or eighteen-table systems. In short, this three-table system seems to have been widely used to teach basic literacy in the Brāhmī-derived scripts in the Central Asian oasis cultures.⁵³

52 E.g., fragment 3 (p. 596) reads */// ndu nde ndai ... /// /// .y khyai khyo... ///*

53 Several other Khotanese syllabaries published in Skjærvø 2002 (p. 257, IOL 36/10; p. 386, IOL Khot 173/12; p. 478, IOL Khot 220/2; pp. 526–527, IOL Khot S. 22; pp. 528–530, IOL Khot. S. 24) also contain complete or partial sets of the consonants plus *y* or *r*.

Despite the evident popularity of the basic three-table system, other fragmentary Central Asian syllabaries do represent expanded systems which resemble, but are apparently not identical to the twelve-table scheme described by Huilín. Moreover, these Central Asian texts seem to represent several different systems, as is also the case for the East Asian systems (as was mentioned in the previous section). In many but not all of these syllabaries, the sets of consonant combinations are written out in full, that is, with each of their vocalic variants. For example, several small fragments from Šorčuk, published in the first volume of the *Sanskrihandschriften aus den Turfanfunden*,⁵⁴ contain parts of such expanded sets. For example, ms. 446 (p. 199) has part of the series of the consonants combined with *ṇ* (*gṇū gṇe* through *dhṇ.*), while the three small fragments of ms. 445 (pp. 198-9) preserve parts of the series of consonant conjuncts with *ṇ* (*lṇaḥ* through *ttsṇa*) and with *t* (*gtā gti* through *jtai jto* and *nti ntī* through *mtō mtau*).

In some fragments of this class, enough of the text remains to show the relative sequence of two or more of the consonantal combination sets. For example, one of the fragments of another syllabary has on one side⁵⁵ part of the sequence of the consonants plus *n* (*ḍhnaṃ* through *bhn[u]*) and on the other the consonants plus *ñ* (*ghña* through *ḍhñu*). Such small fragments are not sufficient to establish the complete pattern of the entire text, but we can get a better picture – though in most cases still not a complete one – from another type of syllabary in which the consonant combinations are written out in order with only the base form (i.e., with the inherent *a*) instead of with all of their vocalic variants.⁵⁶ With this arrangement, we can get from a small fragment much more information about the overall pattern of the syllabic combinations. For instance, a fragment from Khotan begins with *tla tva ...*

54 Waldschmidt 1965: ms. nos. 244, 245, 445, 446, 488, 632, 794, 795.

55 Published by Vorob'ev-Desjatovskij (1958: 292), who took this side to be the verso, but this was correctly re-identified by Couvreur (1965: 130) as the recto on the basis of similar sequences in other syllabaries, to be discussed below.

56 According to Couvreur (1965: 117, 134), these sequences were used to conclude complete syllabic tables and serve as indices to them. But in view of their frequency, it seems that such tables may also have sometimes been written out independently.

[th]ya thra thla thva th[t?]a etc. and continues through the corresponding combinations of the succeeding head consonants *d, dh, n, p, ph, b, bh,* and *m,* each with the subscripts *y, r, l, v,* and *t* (*dya dra dla ... dhya dhra dhla dhva dhla etc.* through *m̄la m̄va*).⁵⁷ This establishes a partial series of five tables with the subscript consonants *y r l v t.*

In at least two cases, we have fragments of summary syllabaries of this type that are sufficient to enable us to reconstruct the complete or nearly complete sequence of tables that they represent or summarize. One of these, from Duldur Aqur (Couvreur 1965: 134-135) yields the pattern *C Cy Cr Cl Cv Cm Ct Cn Cñ Cṅ rC Cṛ Cṝ Cam Cah̄.* This seems to be based on a eleven-table series (*C* through *rC*), to which were added by way of a supplement the combinations with the vowels *ṛ* and *ṝ* which, as has been noted above (section 1), were absent from the original *siddham* charts. Another similar but not identical sequence can be deduced from a Tocharian syllabary from Šorčuk⁵⁸ in which the entire sequence is preserved for the last five head consonants (... *ṣca ṣña rṣa ṣṛ ṣṝ ṣam ṣah̄* through *ttsa ttsya ttsra ttsla ttsva ttsma ttsta ttsna ttsṇa ttsca ttsña rttsa ttsṛ ttsṝ ttsam ttsah̄*), yielding the order *C Cy Cr Cl Cv Cm Ct Cn Cṅ Cc Cñ rC Cṛ Cṝ Cam Cah̄.* In this case the system is explicitly labeled as a twelve-fold one in the immediately following colophon, reading, literally ‘This twelfth art [of writing] has come about in writing.’⁵⁹

These two fully reconstructed Central Asian *siddham* systems are identical for the first eight tables (*C Cy Cr Cl Cv Cm Ct Cn*), and differ only slightly in their last three/four members (*Cñ Cṅ rC* vs. *Cṅ Cc Cñ rC*), and in this they, as well as the fragmentary and abridged ones mentioned previously, follow the general patterns that are typical of *siddham* schemes attested elsewhere. All of these systems begin with the simple consonants and are followed by the combinations of the consonants with the four semivowels in their traditional

57 F.W. Thomas 1954: 694.

58 Sieg and Siegling 1921: v; Sieg and Siegling 1953: 387, no. 605; Couvreur 1965: 135.

59 *Sās śākwepint amok piktsi papyutāk*, translated by Couvreur (1965: 117) as ‘deze twaalfde (schrijf)kunst is in schrift tot stand gekomen.’

order (*Cy Cr Cl Cv*). After this, the systems diverge in details, but typically the five nasals are included immediately or soon after the semivowel combinations. In Huilín's twelve-table pattern the nasals follow in their traditional alphabetic order (*Cñ Cñ Cṅ Cn Cm*), but in the others, including the two Central Asian systems discussed here, the order of the nasals and the number of them included (varying from three to five) are seemingly arbitrary. A further example of this pattern of variation among the nasal combinations is seen in another fragment published by Couvreur⁶⁰ in which the combinations of the consonants with subscript *n* immediately precede the *r*-plus-consonant combinations, whereas the other two reconstructed systems have *Cṅ* or *Cñ* in the corresponding position.

Besides these members which are shared by all or most of the systems, though in differing orders, other consonantal combinations are found only in certain formulations of the *siddham* system. For instance, both of the systems described above include the consonants plus *t* as well as the graphically special combinations of preceding (superscript) *r* plus the consonants, but only the second one has the set of consonants plus *c*. Some fragmentary Central Asian syllabaries include yet other subscript consonant sets. For example, a group of fragments contains part of a fully expanded set of combinations of the consonants plus *p* (*cpe cpai cpo* through *dpai dpo dpau*).⁶¹ Similarly, the small fragment of a summary set (i.e., without the vowel expansions) seems to have a set of the consonants plus *s* before the *r*-plus-consonants set, as in recto line 3, ... *bhsa rbha* ...⁶² In both of these cases, it is not clear where these combination sets (*Cp* and *Cs*) would have been located within their overall schemes.⁶³

60 1965: 130–132 (no. 18).

61 Couvreur 1965: 132–133.

62 Thomas 1954: 695. The sequence represented by this small fragment seems to be aberrant in several regards, but these are difficult to explain due to the small amount of text which survives; cf. Couvreur 1965: 134 n. 79, 'Ten dele afwijkende kombinaties vertoont het 'new fragment' II' ('The 'new fragment' II shows partly divergent combinations').

63 Cf. Couvreur 1965: 117, 133.

Thus it becomes clear that within the general framework of the *siddham* system, there was in Central Asia a good deal of variation in the specific structures of the tables. But this is hardly surprising since, as we have already seen, this was also the case in the East Asian materials. The *siddham/dvādaśākṣarī* system seems to have functioned as a broad framework rather than a single fixed model, and apparently different local traditions, or perhaps just the personal preferences of particular teachers or institutions, led to the development of a large number of variant systems. But it does nevertheless seem to be the case, as far as we can tell in view of the fragmentary nature of virtually all of the relevant materials, that systems with twelve tables or a similar number predominated in Central Asia, and that these systems resembled but were not identical to the twelve-table system which was definitively described by Huìlín. On the other hand, we find among the Central Asian materials no clear evidence of eighteen-table systems such as the one which Yìjìng reported to have been in use in India.

6. Some observations and conclusions

The material presented above demonstrates the diversity and variability, both over space and over time, of the various *siddham* systems. Even though we have hardly any direct ancient attestation for the original Indian system, and even though for its Central Asian developments we have only some randomly scattered remnants, we can nonetheless trace some outlines of the history of the *siddham* tradition, especially with the help of the extensive East Asian literature which helps us to read back into its earlier phases. From the testimony of the pilgrims Xuánzàng and Yìjīng, we know that both the twelve-chart and eighteen-chart systems which they respectively describe were the standard pedagogical systems used in India in the seventh century. In Central Asia, however, the vast majority of the syllabary texts employ – as far as we can tell from their fragmentary state – either the twelve-table system or similar configurations, or a reduced three-table system which is not directly attested elsewhere. A few specimens seem to follow another set of principles entirely, but there are, somewhat surprisingly, no examples of the eighteen-table system which was viewed as the authoritative one in the Chinese *siddham* tradition. Of course here, as always in this field, we are looking at a very incomplete and possibly misleading picture, and there is no doubt much more to the story; perhaps we will someday learn a little more of it.

Anyone who is familiar with Sanskrit and related languages will have been struck by an obvious peculiarity of the *siddham* system, in all of its various manifestations: on the one hand, none of them constitutes anything like a complete list of actually occurring syllables, while on the other hand, all of them contain syllables which not only unattested but are actually grammatically impossible and thoroughly unpronounceable. For example, we have already seen, in the syllabary from Kucha published by Vorob'ev-Desjatovskij (1958: 291-293), sequences like *chñu chñū chñe* and *ḍhñā ḍhñī ḍhñī ḍhñu*. In the more comprehensive schemes such as the eighteen-chart system, we find even stranger combinations; for example, the eleventh chart, under the pattern *rCl*, produces such oddities as *rcla*, *rṭla*, *ryla*, and *rkṣla*.

As for consonant clusters that actually occur in Sanskrit but are not attested in the *siddham* tables, the popular twelve-table system does not account for common geminates such as *gga* or *tta*, nor even for extremely common combinations such as the nasals plus homorganic consonants (*nta*, *mbha*, etc.). Some of these gaps (e.g., *dga*, *dba*, *ṭṭa*) are filled in the more comprehensive eighteen-chart system, especially in the last two sections, which are miscellaneous supplements, but even there some gaps are left.

The reason for this apparent anomaly lies, it seems to me, in the historical origins of the *siddham* system, such as we first saw them in the terracotta images from Sugh. For it was originally designed as a system for teaching small children to write, and was not meant to be a catalogue of actually occurring forms. As we saw in connection with the brief discussion of writing pedagogy in other parts of the world (section 3), such systems often involve syllabic combinations which are intended purely as exercises, without regard to their meaning or lack thereof.

This is not to say, however, that the various *siddham* systems are entirely divorced from practical reality. We have seen, for example, that the first three charts of both the twelve- and eighteen-chart systems are the bare consonants and the consonants with following *y* and *r*; and these in fact include

some of the most common consonant clusters in Sanskrit. It is therefore no coincidence that the minimal three-chart system found in some Central Asian manuscripts is limited to this basic practical level. But in the more elaborate systems these three sets are followed by the consonants plus *l* and *v*, which—especially the former—are less common. (Here the sequence reflects the traditional ordering of the four semivocalic consonants.) After this, matters become more complicated. In the twelve-table system, the next two sets are consonants plus *s* and *h*, which are much less common, and indeed, in the case of *h*, quite exceptional. Here, as also in the following sets involving the five nasals, the extended system seems to have abandoned practical phonetics and become merely a matter of graphic exercise.

In the expanded eighteen-chart system, however, we can discern an effort to reconcile the underlying pedagogical system with the realities of Sanskrit phonetics. The sixteenth chart, for example, lists the consonants with the vowel *r̥*, which (as discussed above in section 1) was for historical reasons missing from the basic *siddham* systems. The seventeenth and eighteenth tables, as we have also seen, are similarly a grab-bag of miscellaneous combinations which were not covered in the previous sections.

By now we have seen how the two alphabetic sequences which were used in ancient India developed into cultural icons which spread far beyond their Indian homeland. The old *Arapacana* order of the Kharoṣṭhī alphabet, though long dead and forgotten in its homeland in northwestern India, lived on as a ritual mnemonic device in Buddhist tradition. In East Asia, the *siddham* system became, and still remains, a central focus for the practice of esoteric Buddhism.

The *siddham* system also has an important legacy in Japan on another level. As is widely recognized,⁶⁴ the structure and ordering principles of the standard tables (音図 *onzu*) of the syllabic *kana* characters – *ka ki ku ke ko; sa si [shi] su se so; ta ti [chi] tu [tsu] te to*, etc. – are based on the *siddham* sequence, both in regard to the order of the consonants (*k s t n p m y r w*) and of the vowels (*a i u e o*). So in the end, the survival, in various forms and transformations, of the two archetypal Indian syllabaries is a testimony to the deep and lasting, though not always obvious or fully recognized influence of Indian traditions on the rest of Asia.

64 See, for example, Miller 1967: 128–129 and Frellisvig 2010: 178.

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