Outline of Gāndhārī Grammar

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1 The Sound System of Gāndhārī

Old Indo-Aryan and Gāndhāri share a system of five vowel sounds:

	front	central	back
close	i		u
mid	e		o
open		ə	

In OIA, the vowels *i* [i], *u* [u] and *a* [ə] occur in short and long variants, while *e* [e:] and *o* [o:] are always long. In G as in other MIA dialects, all five vowels occur in long and short variants. OIA additionally has two diphthongs *ai* [əj] and *au* [əʊ].

Consonant sounds of Old Indo-Aryan (in this and the following table, parentheses indicate non-phonemic status):

	labial	dental	alveolar	retroflex	palatal	velar	glottal
plosive	p pʰ b bʱ	t tʰ d dʱ		ʈ ʈʰ ɖ ɖʱ	c cʰ ɟ	k kʰ g gʱ	
nasal	m	n		ɳ	(ɲ)	ŋ	
fricative		s		ʂ	ç		
tap			ɾ				
approximant	ʋ ʋ̃	l			j		(h) ɦ

Consonant sounds of Gāndhārī:

	labial	dental	alveolar	retroflex	palatal	velar	glottal
plosive	p pʰ b bʱ	t tʰ d dʱ		ʈ ɖ ɖʱ	tɕ tɕʰ dʑ	k kʰ g gʱ	
nasal	m mʱ	n nʱ		(ɳ)	ɲ	(ŋ)	
fricative		(ð) s (z)		ʂ (z)	ç (j)		
tap			ɾ	(ɽ) (ɽʱ)			
approximant	ʋ (ʋʱ) ʋ̃	l			j		ɦ

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2   Sound Changes from Old Indo-Aryan to Gāndhārī

2.1   Vowels

2.1.1   Monophthongization

The OIA diphthongs *ai* [əj] and *au* [əʋ] undergo monophthongization and merge with the long vowels *e* [eː] and *o* [oː]. This sound change is shared with the other MIA languages.

> OIA *traividyatā* > **trevijada** [tɾeːʋidʑːəðə] (cf. P *tevijjatā*)
> OIA *kauśalya* > **kośala** [koːjəlːə] (cf. P *kosalla*)

The OIA sound sequences *aya* [əjə] and *ava* [əʋə] are optionally contracted to the long vowels **e** [eː] and **o** [oː]. This sound change is mostly restricted to certain morphological elements, such as the stem termination of class 2 verbs (see § 3.4) and the verbal prefix OIA *ava-* > **o-** [oː], and is shared with other MIA languages.

> OIA *darśayati* > **daśedi** [dəçːeːðe] (cf. P *dasseti*)
> OIA *saṃbhavati* > **saṃbhodi** [səmbʱoːðe] (cf. P *sambhoti*)

2.1.2   Vocalization of *ṛ* [r̩]

The OIA syllabic trill *ṛ* [r̩] undergoes vocalization. The default outcome is the vowel *i*, but after labial consonants and before labial vowels OIA *ṛ* [r̩] turns into **u** [u]. At an intermediate stage of this vocalization process, the vowel was preceded (when medial) or followed (when initial) by a tap [ɾ]. The vocalization **a** [ə] (without tap) occurs in loanwords from central MIA.

> OIA *dṛṣṭa* > [dɾiʂʈə] > **diṭha** [diʂʈə] (cf. P *diṭṭha*)
> OIA *ṛddhi* > [iɾdʱe] > **idhi** [idʱːe] (cf. P *iddhi*)
> OIA *pṛcchati* > [pɾutɕʰːəðe] > **puchadi** [putɕʰːəðe] (cf. P *pucchati*)
> OIA *ṛju-* → **uju** [udʑːo] (cf. P *ujju*)
> OIA *tṛṣṇā* → **taṣa** [təʂɳə] (cf. P *taṇhā*)

2.1.3   Law of Two Moras

OIA syllables containing a long vowel and a closing consonant, making a total of three moras, were subject to a general MIA reduction to two moras by shortening of the vowel, or by simplification of the following consonant cluster leading to an open syllable. Because long vowels are not marked in the Kharoṣṭhī script, only the second effect of the Law of Two Moras can be reliably observed in G (through subsequent weakening of the intervocalic consonant).

OIA *āsrava* > **asava** [aːzəʋə] (cf. P *āsava*)
OIA *apāśrayati* > **avaśedi** [əʋaːɟeːðe] (cf. P *avasseti*)
OIA *-asya* > **-asa** [aːzə] (cf. P *-assa*)

2.1.4 Opening of Short Vowels

The OIA short vowels *i* and *u* are frequently opened to [e] and [o] in closed syllables, especially when followed by retroflex or aspirated consonants.

OIA *vāsiṣṭha* > **vasiṭha** [ʋaːzeʂʈə] (cf. P *vāsiṭṭha*)
OIA *buddha* > **budha** [bodʱːə] (cf. P *buddha*, Bactrian βοδδο)

2.1.5 Reduction of Final Vowels

Word-final long vowels (original or the result of MIA consonant loss) are shortened, and the close short vowels *i* and *u* are frequently opened to [e] and [o].

OIA *pāṃsuḥ* > **paṃsu** [pəʊ̃so] (cf. P *paṃsu*)
OIA *abhūt* > **ahu** [əɦo] (cf. P *ahū*)
OIA *prahāya* > **prahaya** [pr̥əɦaːje] (cf. P *pahāya* and § 2.1.6)

2.1.6 Palatalization and Labialization of *a* [ə]

In certain positions in the word, short *a* [ə] is palatalized when adjacent to [j] (whether original or the result of G consonant weakening) and labialized when adjacent to [ʋ]. Before [j] the palatalization result is [e], but after [j] it is [i] (which turns into [e] when word-final, cf. § 2.1.5). Before [ʋ] the labialization result is [o]. In some cases, *a* [ə] following *m* [m] is labialized to **u** [u].

OIA *udayāstagama* > **udayastagama** [uðejəstəjəmə] (cf. P *udayatthagama*)
OIA *āyatana* > **ayadana** [aːjiðənə] (cf. P *āyatana*)
OIA *syāt* > **siya** [sije] (cf. P *siyā*)
OIA *bhavati* > *hovadi* [ɦoʋəðe] (cf. P *bhavati*)
OIA *samanvāgata* > **samuṃnagada** [səmunːaːjiðə] (cf. P *samannāgata*)

2.2 Consonants

Consonants undergo a variety of weakenings, assimilations, dissimilations and metatheses. The details of some of these processes (§§ 2.2.3, 2.2.5.9) depend on whether the sounds in question occur in normal position within a word or in weak terminational position.

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2.2.1 Affrication of Palatal Plosives

The palatal plosives undergo affrication to alveolo-palatal affricates.

> OIA *citta* > **cita** [tɕitːə] (cf. P *citta*)
> OIA *cheda* > **cheda** [tɕʰeːðə] (cf. P *cheda*)
> OIA *jana* > **jana** [dʑənə] (cf. P *jana*)

2.2.2 Merger of *n* [n] and *ṇ* [ŋ]

The dental and retroflex nasals undergo merger; the result of this merger is here transcribed as **n** [n].

> OIA *kāraṇa* > **karana** [kaːɾənə] (cf. P *kāraṇa*)
> OIA *nidāna* > **nidana** [niðaːnə] (cf. P *nidāna*)

2.2.3 Weakening and Strengthening of Medial Short Consonants

Word-medial short plosives and fricatives undergo regular weakening when surrounded by vowels. The unaspirated labial plosives *p* [p], *b* [b] are reduced to the labial approximant **v** [ʋ], the palatal and velar plosives *c* [c], *j* [ɟ], *k* [k], *g* [g] to the palatal approximant **y** [j], the unaspirated dental plosives *t* [t], *d* [d] to the dental fricative **d** [ð], and the unaspirated retroflex plosives *ṭ* [ʈ], *ḍ* [ɖ] to the retroflex tap *ḍ*/ [ɽ].

> OIA *lapana* > **lavana** [ləʋənə] (cf. P *lapana*)
> OIA *abandhana* > **abaṃdhana** [əʋəndʱənə] (cf. P *abandhana*)
> OIA *gocara* > **gocara** [goːjəɾə] (cf. P *gocara*)
> OIA *prajānāti* > **prajanadi** [pɾəjaːnaːðe] (cf. P *pajānāti*)
> OIA *loka* > **loga** [loːjə] (cf. P *loka*)
> OIA *rāga* > **raga** [ɾaːjə] (cf. P *rāga*)
> OIA *anupahata* > **anuvahada** [ənuʋəɦəðə] (cf. P *anupahata*)
> OIA *upādāna* > **uvadana** [uʋaːðaːnə] (cf. P *upādāna*)
> OIA *koṭi* > **koḍi** [koːɽe] (cf. P *koṭi*)
> OIA *pīḍā* > **piḍa** [piːɽə] (cf. P *pīḷā*)

The aspirated dental plosives *th* [tʰ], *dh* [dʱ] are reduced to the dental fricative **s** [z], the aspirated retroflex plosives *ṭh* [ʈʰ], *ḍh* [ɖʱ] to the aspirated retroflex tap **ḍh** [ɽʱ], and the aspirated velar plosives *kh* [kʰ], *gh* [gʱ] to the glottal phonation **h** [ɦ]. The development of the aspirated labial plosives *ph* [pʰ], *bh* [bʱ] depends both on their position in the word and on their phonetic environment: their default reduction is the aspirated labial approximant **vh** [ʋʱ], but in weak terminational position and when adjacent to labial vowels they are reduced to the glottal phonation **h** [ɦ].

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OIA *śamatha* > **śamasa** [çəməzə] (cf. P *samatha*)
OIA *nirodha* > **nirosa** [niɾoːzə] (cf. P *nirodha*)
OIA *prauḍha* > **proḍha** [pɾoːɽʱə]
OIA *sukha* > **suha** [suɦə] (cf. P *sukha*)
OIA *ogha* > **oha** [oːɦə] (cf. P *ogha*)
OIA *abhijñā* > **avhiṃña** [əʋʱiɲːə] (cf. P *abhiññā*)
OIA *tribhiḥ* > **trihi** [tɾiːɦe] (cf. P *tīhi*)
OIA *ubhaya* > **uhaya** [uɦəjə] (cf. P *ubhaya*)

The dental fricative *s* [s] is voiced to **s** [z], the retroflex fricative *ṣ* [ʂ] to **ṣ** [ʐ], and the palatal fricative *ś* [ç] to **ś** [ʝ].

OIA *bodhi* > **bosi** [boːze] (cf. P *bodhi*)
OIA *puruṣa* > **puruṣa** [puruʐə] (cf. P *purisa*)
OIA *ākāśa* > **akaśa** [aːjaːʝə] (cf. P *ākāsa*)

The glottal phonation *h* [ɦ] remains regularly unchanged, but is strengthened to the velar fricative **ś** [ʝ] in one lexical item.

OIA *moha* > **moha** [moːɦə] (cf. P *moha*)
OIA *iha* > **iśa** [iʝə] (cf. P *iha*)

2.2.4 Loss and Weakening of Final Consonants

Word-final plosives and *ḥ* [h] are lost completely. The word-final nasals *m* [m] and *n* [n] are lost after long vowels and weakened to the nazalized approximant [ʋ̃] after short vowels (but cf. § 3.1.1 on the analogical generalization of the direct-case ending **o** [o]).

OIA *tāvat* > **tava** [taːʋə] (cf. P *tāva*)
OIA *parivrajet* > **parivaje** [pəɾiʋːəje] (cf. P *paribbaje*)
OIA *samyak* > **saṃma** [səmːe] (cf. P *sammā*)
OIA *agniḥ* > **agi** [əgːe] (cf. P *aggi*)
OIA *mārgāḥ* > **maga** [məgːə] (cf. P *maggā*)
OIA *tṛṣṇānām* > **taṣana** [təʂɳaːnə] (cf. P *taṇhānaṃ*)
OIA *skandhān* > **kaṃdha** [kəndʱə]
OIA *idam* > **ida** [iðəʋ̃] (cf. P *idaṃ*)
OIA *asmin* → **imaspi** [iməspiʋ̃] (cf. P *imasmiṃ*)

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2.2.5   Assimilation of Consonant Clusters

1. Two Plosives or Two Nasals

Clusters of two plosives or two nasals undergo complete assimilation to a long version of the second consonant.

OIA *satkāya* > **sakaya** [sək:aːjə] (cf. P *sakkāya*)
OIA *udghātana* > **ughaḍana** [ugʱːaːɽənə] (cf. P *ugghāṭana*)
OIA *mukta* > **muta** [mutːə] (cf. P *mutta*)
OIA *prāpta* > **prata** [pɾətːə] (cf. P *patta*)
OIA *utpadyate* > **upajadi** [upːəʥːəðe] (cf. P *uppajjati*)
OIA *labdha* > **ladha** [ləðʱːə] (cf. P *laddha*)
OIA *tanmaya* > **taṃmaya** [təmːəjə] (cf. P *tammaya*)

2. Nasal + Plosive

Clusters of a nasal with a following homorganic plosive generally remain unchanged, but in the language of the Khotan Dharmapada (and occasionally in other texts) the nasal causes voicing of an unvoiced plosive and complete assimilation of a voiced plosive.

OIA *śānti* > **śaṃti** [çənte], Dhp-G^K *śadi* [çənde] (cf. P *santi*)
OIA *saṃstava* > **saṃstava** [səʊ̃stəʋə], Dhp-G^K *sadhava* [sənðʱəʋə] (cf. P *saṃthava* and § 2.2.5.13)
OIA *vindati* > **viṃdadi** [ʋindəðe], Dhp-G^K *vinadi* [ʋinːəðe] (cf. P *vindati*)
OIA *gandharva* > **gaṃdhava** [gənðʱəʋːə], Dhp-G^K *gañava* [gənʱːəʋːə] (cf. P *gandhabba*)
OIA *piṇḍa* > **piṃḍa** [piɳɖə], Dhp-G^K *piṇa* [piɳːə] (cf. P *piṇḍa*)
OIA *saṃkalpa* > **saṃkapa** [səŋkəpːə], Dhp-G^K *sagapa* [səŋgəpːə] (cf. P *saṃkappa*)
OIA *saṃskāra* → **saṃkhara** [səŋkhaːɾə], Dhp-G^K *saghara* [səŋgʱaːɾə] (cf. P *saṃkhāra*)
OIA *saṅga* > **ṣaṃga** [səŋgə], Dhp-G^K *ṣaga* [ʂəŋːə] (cf. P *saṅga*)
OIA *saṃgha* > **saṃgha** [səŋgʱə], Dhp-G^K̄ *saḡa* [səŋʱːə] (cf. P *saṃgha*)

3. *l* [l], *r* [ɾ], *ḥ* [h] + Consonant

The dental approximant *l* [l], the alveolar tap *r* [ɾ] and the glottal phonation *ḥ* [h] undergo complete assimiliation to any following consonant.

OIA *vitarka* > **vitaka** [ʋitəkːə] (cf. P *vitakka* and § 2.4)
OIA *mārga* > **maga** [məgːə] (cf. P *magga*)

OIA *vartayati* > **vatedi** [vət:eːðe] (cf. P *vatteti*)
OIA *tīrthika* > **tithiga** [titʰːijə] (cf. P *titthiya*)
OIA *nirdeśa* > **nideśa** [nidːeːjə] (cf. P *niddesa*)
OIA *bahirdhā* > **bahidha** [bəɦidʰːə] (cf. P *bahiddhā*)
OIA *asaṃtarpita* → **asaṃtapayida** [əzəntəpːəjiðə] (cf. P *asantap-pita*)
OIA *caturbhiḥ* > **caduhi** [tɕːəðuːɦe] (cf. P *catūhi*)
OIA *apragalbha* > **apragabha** [əprəgəbʰːə] (cf. P *appagabbha*)
OIA *varṇa* > **vaṃna** [vənːə] (cf. P *vaṇṇa*)
OIA *dharma* > **dhaṃma** [dʰəmːə] (cf. P *dhamma*)
OIA *darśana* > **daśana** [dəɕːənə] (cf. P *dassana*)
OIA *sparśita* > **phaṣida** [pʰəʂːiðə] (cf. P *phassita*)
OIA *caturṣu* > **caduṣu** [tɕəðuːʐo] (cf. P *catūsu*)
OIA *duḥkha* > **dukha** [dukʰːə] (cf. P *dukkha*)

4. *s* [s], *ṣ* [ʂ], *ś* [ɕ] + Plosive

    The clusters *st* [st] and *ṣṭ* [ʂʈ] are preserved unchanged, and the cluster *ṣṭh* [ʂʈʰ] merges with [ʂʈ]. The clusters *sp* [sp] and *sth* [stʰ] undergo assimilation to the aspirated plosives **ph** [pʰ] and **th** [tʰ]. It is unclear whether the clusters *sk* [sk] and *ṣk* [ʂk] are preserved unchanged or assimilated to [kʰ]; they are here transcribed as [sk] and [ʂk].

    OIA *sparśita* > **phaṣida** [pʰəʂːiðə] (cf. P *phassita*)
    OIA *vastu* > **vastu** [vəsto] (cf. P *vatthu*)
    OIA *upasthita* > **uvaṭhida** [uvətʰːiðə] (cf. P *upaṭṭhita*)
    OIA *dṛṣṭi* > **diṭhi** [diʂʈe] (cf. P *diṭṭhi*)
    OIA *pratiṣṭhita* > **pradiṭhida** [prəðiʂʈiðə] (cf. P *patiṭṭhita*)
    OIA *skandha* > **kaṃdha** [skəndʰə] (cf. P *khandha*)

5. Plosive + *s* [s], *ṣ* [ʂ]

    Where a plosive is followed by a fricative, it undergoes partial assimilation, adopting the point of articulation of the latter.

    OIA *amatsarin* > **amatsari** [əmətsəɾe] (cf. P *amacchari*)
    OIA *yakṣa* > **yakṣa** [jəʈʂə] (cf. P *yakkha*)

6. Plosive + *l* [l], *r* [ɾ], *y* [j], *n* [n], *ñ* [ɲ]

    Clusters of plosives followed by *r* [ɾ] are preserved unchanged; in clusters of plosives followed by *l* [l], the [l] changes to **r** [ɾ].

OIA *prajñā* > **pramña** [pɾəɲːə] (cf. P *paññā*)
OIA *brāhmaṇa* > **braṃmana** [bɾəmʱːənə] (cf. P *brāhmaṇa*)
OIA *sūtra* > **sutra** [sutɾə] (cf. P *sutta*)
OIA *dravya* > **drava** [dɾəʋːə] (cf. P *dabba*)
OIA *agṛdhra* > **agidhra** [əgidʱɾə] (cf. *agiddha*)
OIA *atikrama* > **adikrama** [əðikɾəmə] (cf. P *atikkama*)
OIA *agra* > **agra** [əgɾə] (cf. P *agga*)
OIA *śukla* > **śukra** [çukɾə] (cf. P *sukka*)

When a coronal (dental, retroflex or palatal) plosive is followed by a coronal approximant or nasal (*y* [j], *n* [n], *ñ* [ɲ]), they undergo mutual assimilation at the point of articulation of the second member of the cluster.

OIA *satya* > **saca** [sətɕːə] (cf. P *sacca*)
OIA *yathātathya* > **yasatacha** [jəza:ðətɕʰə] (cf. P *yathātaccha*)
OIA *avidyā* > **avija** [əʋidʑːə] (cf. P *avijjā*)
OIA *anumadhya* > **anumaǰa** [ənuməɟːə] (cf. P *anumajjha*)
OIA *vimucyate* > **vimucadi** [ʋimutɕːəðe] (cf. P *vimuccati*)
OIA *abhijñā* > **avhiṃña** [əʋʱiɲːə] (cf. P *abhiññā*)

When a non-coronal plosive is followed by a coronal approximant or nasal, they undergo complete assimilation resulting in a long version of the original plosive.

OIA *agni* > **agi** [əgːe] (cf. P *aggi*)
OIA *saṃkhyāta* > **saṃkhada** [səŋkʰaːðə] (cf. P *saṅkhāta*)
OIA *lipyate* > **lipadi** [lipːəðe] (cf. P *lippati*)
OIA *abhyāsa* > **abhasa** [əbʱːaːzə]

7. *s* [s], *ṣ* [ʂ], *ś* [ç] + Nasal, *v* [ʋ]

Clusters of fricatives with non-labial nasals can assimilate the fricative to the point of articulation of the nasal, or undergo complete assimilation to a long aspirated version of the nasal. Both of these possibilities are reflected in the modern Dardic languages.

OIA *sneha* > **s̄eha** [sneːɦə] (cf. P *sineha*)
OIA *praśna* > **prasā** [pɾəsnə], [pɾəɲʱːə] (cf. P *paṇha*)
OIA *kṛṣṇa* > **kiṣa** [kiʂɳə], [kiɳːʱə] (cf. P *kaṇha*)

In clusters of fricatives followed by the labial nasal *m* [m], the [m] is occluded to the labial plosive **p** [p]. Clusters of fricatives followed by the

labial approximant *v* [ʋ] undergo the same development via an intermediate merger of [ʋ] with [m].

> OIA *anusmṛti* > [ənusməðe] > **anuspadi** [ənuspəðe] (cf. P *anussati*)
> OIA *svara* > [smərə] > **spara** [spərə] (cf. P *sara*)
> OIA *āyuṣmān* → **ayaspa** [aːjiʂpə] (cf. P *āyasmā*)
> OIA *kaśmīra* > [kəçmiːrə] > **kaspira** [kəçpiːrə] (cf. P *kasmīra*)
> OIA *śāśvata* > [çəçməðə] > **saspada** [çəçpəðə] (cf. P *sassata*)

8. *s* [s], *ṣ* [ʂ], *ś* [ç] + *l* [l], *r* [ɾ], *y* [j]

Clusters of fricatives with *y* [j] undergo complete assimilation. In the case of *ṣy* [ʂj], the second element determines a palatal outcome, but in the case of *sy* [sj] the dental articulation of the first element prevails.

> OIA *niṣyanda* → **nisaṃda** [nisːəndə] (cf. P *nissanda*)
> OIA *kāyasya* > **kayasa** [kaːjaːzə] (see § 2.3, cf. P *kāyassa*)
> OIA *manuṣya* > **manuśa** [mənuçːə] (cf. P *manussa*)
> OIA *paśyati* > **paśadi** [pəçːəðe] (cf. P passati)

Clusters of fricatives with *l* [l] and *r* [ɾ] generally undergo complete assimilation to a retroflex fricative **ṣ** [ʂː], but in those cases where another retroflex sound occurs later in the word, partial assimilation to a dental-alveolar cluster **sr** [sɾ] is the result.

> OIA *anavasruta* > **anavaṣuda** [ənoʋəʂːuðə] (cf. P *anavassuta*)
> OIA *śrāvaka* > **ṣavaga** [ʂaːʋejə] (cf. P *sāvaka*)
> OIA *śreṣṭhin* > **sreṭhi** [sɾeʂʈe] (cf. P *seṭṭhi*)
> OIA *ślakṣṇa* > **sraṣa** [sɾəʂɳə] (cf. P *saṇha*)

9. Plosive + *m* [m], *v* [ʋ]

When a plosive is followed by the labial nasal *m* [m], the [m] is deoccluded to the labial approximant [ʋ]. The development of clusters of plosives with [ʋ] depends on their position in the word. In strong position, they are preserved unchanged. In weak terminational position, they undergo complete assimilation. In general, the assimilation result is a long version of the first element, but in the case of *ttv* [tːʋ] (with a long dental plosive across morpheme boundary) the assimilation is mutual and results in a long labial plosive **p** [pː].

OIA *ātmā* > **atva** [ətʋə] (cf. P *attā*)

OIA *tvam* > **tva** [tʋəũ] (cf. P *tuvaṃ*)

OIA absolutive ending *-tvā: pradiṭhahita* [pɾəðiʂʈəɦit:ə] (cf. P *pati-ṭṭhahitvā*)

OIA *arhattva* > **arahapa** [əɾəɦəp:ə] (cf. P *arahatta*)

OIA *adhvan* > **adhva** [əd ɦʋə] (cf. P *addhan*)

10. Nasal + *v* [ʋ], *y* [j]

When a coronal nasal is followed by the coronal approximant *y* [j], they undergo mutual assimilation to a palatal nasal (cf. § 2.2.5.6). When a non-coronal nasal is followed by a coronal approximant or vice versa, they undergo complete assimilation in favor of the first element.

OIA *bhūmya* > **bhuṃma** [bɦum:ə] (cf. P *bhumma*)

OIA *samanvāgata* > **samuṃnagada** [səmun:a:jəðə] (cf. P *samannāgata*)

OIA *anya* > **aṃña** [əɲ:ə] (cf. P *añña*)

OIA *puṇya* > **puṃña** [puɲ:ə] (cf. P *puñña*)

11. *h* [ɦ] + Nasal, *y* [j]

Clusters consisting of the glottal phonation *h* [ɦ] followed by a nasal undergo complete assimilation to an aspirated nasal. The combination of *h* [ɦ] with following *y* [j] correspondingly undergoes assimilation to an aspirated palatal approximant which is then further simplified to a palatal fricative.

OIA *gṛhṇāti* > **giṃnadi** [ginɦa:ðe] (cf. P *gaṇhāti*)

OIA *brāhmaṇa* > **braṃmana** [bɾəmɦ:ənə] (cf. P *brāhmaṇa*)

OIA *dahyamāna* > MIA [dəjɦ:əma:nə] > **daśamana** [dəʝ:əma:nə] (cf. P *dayhamāna*)

12. Combinations of *v* [ʋ], *l* [l], *r* [ɾ], *y* [j]

Combinations of the approximants *v* [ʋ], *l* [l], *r* [ɾ] and *y* [j] undergo complete assimilation according to the strength hierarchy [l] – [ʋ] – [j] – [ɾ] and irrespective of their sequential order.

OIA *sarva* > **sava** [səʋ:ə] (cf. P *sabba*)

OIA *divya* > **diva** [diʋ:ə] (cf. P *dibba*)

OIA *parivrajet* > **parivaye** [pəɾiʋ:əje] (cf. P *paribbaje*)

OIA *kalyāna* > **kalana** [kəl:a:nə] (cf. P *kalyāṇa*)

OIA *paryeṣati* > **payeṣadi** [pəj:e:zəðe] (cf. P *pariyesati*)

13. Three-Consonant Clusters

Clusters of three consonants show four different types of behavior. If the last element of the cluster is *r* [ɾ], the whole cluster is preserved unchanged (cf. § 2.2.5.6):

OIA *strī* → **istri** [istɾe] (cf. P *itthi*)
OIA *mantra* > **maṃtra** [məntɾə] (cf. P *manta*)
OIA *indriya* > **iṃdriya** [indɾijə] (cf. P *indriya*)
OIA *saṃgraha* > **saṃgraha** [səŋgɾəɦə] (cf. P *saṅgaha*)

In all other cases, the position of the syllable boundary within the cluster determines its development. If it falls between the first and second elements, then the last two elements combine independently. The first element is dropped if it is a plosive:

OIA *sūkṣmailā* > **suṣmela** [suʂmeːlə]
OIA *ślakṣna* > **sraṣa** [sɾəʂɳə] (cf. P *saṇha*)
OIA *ikṣvāku* > **iṣmahu** [iʂmaːɦo] (cf. P *okkāka*)

and combines with the result of the first assimilation if it is a nasal or the nasal approximant [ʋ̃]:

OIA *saṃstava* > **saṃstava** [səʋ̃stəʋə], Dhp-G^K *sadhava* [sənd^ɦəʋə] (cf. P *saṃthava* and § 2.2.5.2)
OIA *saṃsthāna* > **saṃṭhaṇa** [sənt^haːnə] (cf. P *saṃṭhāna*)
OIA *saṃkṣepa* > **saṃkṣeva** [sənʈʂeːʋə] (cf. P *saṃkhepa*)
OIA *saṃkhyā* > **saṃkha** [səŋk^hə] (cf. P *saṅkhā*)
OIA *saṃjñā* > **saṃña** [səɲːə] (cf. P *saññā*)
OIA *ākāśāntya* > **akaśaṃca** [aːjaːjəntɕə] (cf. P *ākāsañca*)
OIA *saṃprakhyāna* > **saṃprakhana** [səmpɾək^haːnə] (cf. P *saṃpakkhāna*)

If the syllable boundary falls between the second and third elements, then the first two elements combine independently and the third element is dropped:

OIA *vartman* > **vaṭa** [ʋəʈːə] (cf. P *vaṭṭa*)

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2.3   Transfer of Length from Consonants to Vowels

In some case endings and lexical items, a short vowel followed by a long consonant is changed into the corresponding long vowel and short consonant. This transfer of length applied at a linguistic stage prior to G, and the short consonant subsequently underwent the weakening processes characteristic of G.

> OIA gen. sg. ending -*asya* > MIA [əsːə] > MIA [aːsə] > **-asa** [aːzə] (cf. P -*assa*)
> OIA *caturbhiḥ* > MIA [tɕətubʱːe] > MIA [tɕətuːbʱe] > **caduhi** [tɕəðuːɦe] (cf. P *catūhi*)
> OIA *caturṣu* > MIA [tɕətuʂːo] > MIA [tɕətuːʂo] > **caduṣu** [tɕəðuːʐo] (cf. P *catūsu*)
> OIA *garbha* > MIA [gəbʱːə] > MIA [gaːbʱə] > *gaha* [gaːɦə] (cf. P *gabbha*)

2.4   Metathesis and Copying of *r* [ɾ]

The presence of the alveolar tap *r* [ɾ] in a word sometimes causes the appearance of additional [ɾ] segments in other positions in the same word, and sometimes the original [ɾ] appears to be moved to another position. The direction of both processes is always from the end to the beginning of a word. When an original *r* [ɾ] caused the appearance of another [ɾ], the former can subsequently undergo assimilation processes.

> OIA *agṛdhra* > *agrirdha* [əgɾiɾdʱə] (cf. P *agiddha*)
> OIA *darśita* > *draśida* [dɾəɕiðə] (cf. P *dassita*)
> OIA *duṣkara* → **drukara** [dɾokːəɾə] (cf. P *dukkara*)
> OIA *pūrva* > *prova* [pɾoʋːə] (cf. P *pubba*)
> OIA *tatra* > *tratra* [tɾətɾə] (cf. P *tatra*)

2.5   Remote Assimilation and Dissimilation of *s* [s], *ś* [ç]

When a word contains both a palatal fricative *ś* [ç] and another palatal sound, the fricative is frequently dissimilated to the dental fricative **s** [s].

> OIA *śuci* > **suyi** [suje] (cf. P *suci*)
> OIA *śāśvata* > **saspada** [səçpəðə] (cf. P *sassata*)

Conversely, when a word contains one palatal and one dental fricative, the dental fricative can be assimilated to the palatal.

> OIA *śāsana* > **śaśana** [çaːjənə] (cf. P *sāsana*)
> OIA *saṃśaya* > **saṃśaya** [çə̃ʊ̃çejə] (cf. P *saṃsaya*)

2.6 Loss of Initial *a* [ə]

Two word families show optional loss of initial *a* [ə].

> OIA *arhant* → *rahaṃta* [ɾəhəntə] (cf. P *arahant*)
> OIA *arhattva* > *rahapa* [ɾəhəpːə] (cf. P *arahatta*)
> OIA *araṇya* > *raṃña* [ɾəɲːə] (cf. P *arañña*)

3   Inflexional Morphology

The grammatical system of G is much simpler than that of OIA. Nouns and adjectives have two genders (masculine and feminine), two numbers (singular and plural) and seven cases (direct, instrumental, dative, ablative, genitive, locative, vocative). Pronouns preserve separate nominative and accusative case forms. Verbs have three persons (first, second, third), two numbers (singular and plural), three tenses and two moods (present, future, past, optative, imperative) and two voices (active, passive).

In the following paradigm tables, gaps are left for forms that are not attested in the sample of texts that this grammatical outline is based on, and parentheses indicate non-productive remnant forms.

3.1   Nouns and Adjectives

3.1.1   Masculine **a** Declension

	singular	plural
direct	**-o** [o], **-am** [əʊ̃]	**-a** [ə] (**-ani** [aːne])
instrumental	**-ena** [eːnə]	**-ehi** [eːɦe]
dative	**-aya** [aːjə]	
ablative	**-ado** [aːðo] (**a** [ə])	
genitive	**-asa** [aːzə]	**-ana** [aːnə]
locative	**-e** [e], **-aṃmi** [əmɦːe]	**-eṣu** [eːʐo]
vocative	**-a** [ə]	

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3.1.2 Masculine **i** Declension

	singular	plural
direct	**-i** [e] (**-ino** [ino])	**-i** [e]
instrumental		
dative		
ablative		
genitive	**-isa** [iːzə] (**-ino** [ino])	
locative		

3.1.3 Masculine **u** Declension

	singular	plural
direct	**-u** [o]	**-u** [o]
instrumental		
dative		
ablative		
genitive		
locative	**-uṃmi** [umˤːe]	

3.1.4 Feminine **a** Declension

	singular	plural
direct	**-a** [ə]	**-aya** [aːjə] (**-a** [ə])
instrumental	**-aya** [aːje]	
dative		
ablative	**-aya** [aːje]	
genitive	**-aya** [aːje]	**-ana** [aːnə]
locative	**-aya** [aːje]	**-aṣu** [aːʐo]

3.1.5 Feminine **i** Declension

	singular	plural
direct	**-i** [e]	**-iya** [iːjə]
instrumental	**-iya** [iːje]	**-ihi** [iːɦe]
dative		
ablative	**-iya** [iːje]	
genitive	**-iya** [iːje]	**-ina** [iːnə]
locative	**-iya** [iːje]	

3.1.6 Feminine u Declension

	singular	plural
direct	**-u** [o]	**-uva** [uːʋə]
instrumental	**-uva** [uːʋə]	
dative		
ablative		
genitive	**-uva** [uːʋə]	
locative		**-uṣu** [uːʐo]

3.1.7 Remnants of the Consonant Declensions

The following examples illustrate the preservation of isolated OIA consonant-declension forms in G:

> nom. sg. *ātmā* > **atva** [ətʋə]; instr. sg. *ātmanā* > **atvana** [ətʋənə]; gen.
> sg. *ātmanaḥ* > **atvano** [ətʋəno]
> instr. sg. *karmanā* > **kaṃmana** [kəmːənə]
> acc. sg. *kevalinam* > **kevalino** [keːʋəlino]
> gen. sg. *smṛtyupasthānasamaṅginaḥ* >
> **spaduvaṭhanasamaṃgino** [spəðuʋətʰːaːnəsəməŋgino]
> nom. sg. *prajñāvān* → **praṃñava** [pɾəɲːəʋə]
> nom. sg. *bhagavān* > **bhagava** [bʱəjiʋə]
> acc. sg. *bhagavantam* > **bhagavaṃto** [bʱəjiʋənto]
> instr. sg. *asatā* > **asada** [əzəðə]
> gen. sg. *jāgrataḥ* → **jagarado** [dʑaːjəɾəðo]
> gen. sg. *jānataḥ* > **janado** [dʑaːnəðo]
> acc. sg. *bhagavataḥ* > **bhagavado** [bʱəjiʋəðo]
> acc. sg. *jahataḥ* → **jahanado** [dʑəɦaːnəðo]
> gen. pl. *tārayatām* > **tarayada** [taːɾəjiðə]
> gen. pl. *mocayatām* > **moyayada** [moːjəjiðə]
> gen. pl. *śamayatām* > **śamayada** [çəməjiðə]
> instr. sg. *manasā* > **manasa** [mənəzə]

3.2 Pronouns

3.2.1 Personal Pronouns

nom. *aham* → **aha** [əɦə̃ʊ̃]; acc. *mām* > **ma** [mə̃ʊ̃]; gen. *mama* > **mama** [məmə], *me*
> **me** [me]
nom. *tvam* > **tva** [tʋə̃ʊ̃]; acc. *tvām* > **tva** [tʋə]

3.2.2 Demonstrative Pronouns

	sg. m.	sg. f.	pl. m.	pl. f.
direct	**so** [so]	**sa** [sə]	**te** [te]	**te** [te]
accusative	**ta** [tə]	**ta** [tə]	**te** [te]	
instrumental	**tena** [teːnə]	**taya** [taːjə]	**tehi** [teːɦe]	
dative				
ablative	**tado** [taːðo] (**taspa** [təspə])			
genitive	**tasa** [taːzə]	**tasa** [təsːə]	**teṣa** [teːʐə]	
locative			**teṣu** [teːʐo]	

	sg. m.	sg. f.	pl. m.	pl. f.
direct	**eṣa** [eːʐə] (**eda** [eːðə])	**eṣa** [eːʐə]	**ede** [eːðe]	**ede** [eːðe]
accusative	**eda** [eːðə]		**ede** [eːðe]	
instrumental	**edena** [eːðeːnə]	**taya** [taːjə]	**tehi** [teːɦe]	
dative				
ablative				
genitive	**edasa** [eːða:zə]			
locative				

	sg. m.	sg. f.	pl. m.	pl. f.
direct	**aya** [əje] (**ida** [iðə])	**aya** [əjə]		
accusative	**ima** [imə]			
instrumental	**imena** [imeːnə]			
dative				
ablative				
genitive	**asa** [aːzə]			
locative	**imaspi** [iməspe]			

3.2.3 Relative Pronoun

	sg. m.	sg. f.	pl. m.	pl. f.
direct	**yo** [jo]		**ye** [ye]	
accusative	**ya** [jə]			
instrumental	**yena** [jeːnə]		**yehi** [jeːɦe]	
dative				
ablative	**yado** [jaːðo]			
genitive	**yasa** [jaːzə]			
locative				

3.2.4 Interrogative Pronoun

	sg. m.	sg. f.	pl. m.	pl. f.
direct	**ko** [ko]	**ka** [kə]	**ke** [ke]	
	ki [ke]			
accusative				
instrumental				
dative				
ablative				
genitive	**kasa** [kaːzə]			
locative				

3.3 Numerals

The following examples illustrate the numerals of G:

> dir. **eko** [ekːo]
> dir. **duve** [duʋe], instr. **duvehi** [duʋeːɦe], gen. **duviṃna** [duʋinːə]
> dir. **traye** [tɾəje], instr. **trihi** [tɾiːɦe], gen. **triṃna** [tɾinːə]
> dir. m. **catvari** [tɕətʋaːɾe], f. **cadure** [tɕəðuɾe], instr. **caduhi** [tɕəðuːɦe],
> gen. **caduṃna** [tɕəðunːə], loc. **caduṣu** [tɕəðuːʐo]

3.4 Verbs

3.4.1 Present and Past Tense

Literary G reflects the general MIA (and BHS) system of two productive conjugation classes. Class 1 has present stems that end in short **a** [ə] and forms a preterite by subtraction of the stem vowel and addition of a set of **i** [e] endings (derived from the OIA *iṣ* aorist). Class 2 has present stems that end in long **a** [aː], **e** [eː] or **o** [oː] and forms a preterite by addition of a set of **-si** [ze] / **-ṣi** [ʐe] endings (derived from the OIA *siṣ* aorist). The following table juxtaposes forms from several edited G texts to illustrate this system.

	present	preterite
class 1	**avhinaṃdami** [əvʰinəndaːme]	**avhinaṃdi** [əvʰinənde]
	upajadi [upːədʑːəðe]	**paḍipaji** [pəɽivədʑːe]
		uvapajiṣu [uvəvədʑːiz̥o]
	parakramadi [pəɾaːkɾəməðe]	**avhikrami** [əvʰikɾəme]
		uvasaṃkrami [uvəsəŋkɾəme]
		prakrami [pɾəkɾəme]
	bhavayadi [bʰaːvejəðe]	**bhavayi** [bʰaːvəje]
	bhaṣadi [bʰaːz̥əðe]	**bhaṣiṣu** [bʰaːz̥iz̥o]
		paribhaṣisu [pəɾibʰaːz̥iz̥o]
	vaṃdadi [vəndəðe]	**vaṃdiṣu** [vandiz̥o]
	viharadi [viɦəɾəðe]	**vihari** [viɦəɾe]
class 2	**deśedi** [deːjeːðe]	**deśeṣi** [deːjeːz̥e]

In less formal registers of written G (and presumably in the spoken G dialects), the past tense is primarily expressed by past participles and passive constructions.

3.4.2   Future Tense

The future is formed by substituting the suffix OIA *-iṣya-* > **-iśa** [içːə] for the present stem vowel. The first person singular has the endings **-e** [e] (probably derived from the OIA middle ending) and **-ami** [aːme]; the other persons have the same endings as in the present tense. Examples for the future tense are:

> **kitiśe** [kitːiçːe] (cf. OIA *kīrtayiṣyāmi*, P *kittessaṃ*)
> **uvapajiśadi** [uvəvədʑːiçːəðe] (cf. OIA *upapatsyate*, P *upapajjissati*)
> **bhaviśadi** [bʰəviçːəðe] (cf. OIA *bhaviṣyati*, P *bhavissati*)

3.4.3   Optative

The optative has three productive formations. The paradigm of the first formation is based on the OIA third-person singular ending *-et* and is marked by **-e** [e].

> **parivaye** [pəɾivːəje] (cf. OIA *parivrajet*, P *paribbaje*)

The second optative formation is based on the OIA first-person singular ending *-eyam* and third-person plural ending *-eyuḥ* and is marked by **-eya** [eːje].

> **avhinaṃdeya** [əvʰinəndeːje] (cf. OIA *abhinandet*, P *abhinandeyya*)

The third formation adds the primary endings to the second formation.

> **saṃkiliśeyadi** [səŋkiliçːeːjeðe] (cf. OIA *saṃkliśyeta*, P *saṅkilisseyyāti*)

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3.4.4 Imperative

The singular imperative uses the ending **-a** [ə] for class 1 verbs and the ending **-hi** [ɦe] for class 2 verbs. The plural ending for both classes is **-sa** [zə].

> **agacha** [aːjətɕʰːə] (cf. OIA *āgaccha*, P *āgaccha*)
> **vakarohi** [ʋaːjəɾoːɦe] (cf. OIA *vyākarohi*, P *viyākarohi*)
> **giṃnasa** [ginɦːəzə] (cf. OIA *gṛhṇīta*, P *gaṇhatha*)

3.4.5 Passive

Many verbs employ inherited forms for the passive voice:

> **diśadi** [diçːəðe] (cf. OIA *dṛśyate*, P *dissati*)
> **nihaṃñadi** [niɦəɲːəðe] (cf. OIA *nihanyate*, P *nihaññati*)

The productive passive formation uses the suffix **-iya-** [ije]:

> **saṃhariyadi** [səʊ̃ɦəɾijeðe] (cf. OIA *saṃhriyate*, P *saṃhariyati*)

4 The Kharoṣṭhī Writing System

Gāndhārī is written in the Kharoṣṭhī script. Kharoṣṭhī is derived from the Aramaic script as used in the Achaemenid empire of which Gandhāra formed a province. It runs from right to left and uses the same system of base signs and vowel mātrās as the Brāhmī script and its descendants. Normal Kharoṣṭhī does not mark vowel or consonant length. The Kharoṣṭhī writing system has 42 base signs that were traditionally arranged in the so-called arapacana order:

no.	1	2	3	4	5	6	7
sign	**a**	**ra**	**pa**	**ca**	**na**	**la**	**da**

no.	8	9	10	11	12	13	14
sign	**ba**	**ḍa**	**ṣa**	**va**	**ta**	**ya**	**ṭha**

no.	15	16	17	18	19	20	21
sign	**ka**	**sa**	**ma**	**ga**	**tha**	**ja**	**śpa**

no.	22	23	24	25	26	27	28
sign	**dha**	**śa**	**kha**	**kṣa**	**sta**	**ña**	**ṭa**

no.	29	30	31	32	33	34	35
sign	**bha**	**cha**	**spa**	**vha**	**tsa**	**gha**	**ṭha**

no.	36	37	38	39	40	41	42
sign	**ṇa**	**pha**	**ḱa**	**za**	**ĉa**	**ṭa**	**ḍha**

The following table presents the same 42 signs rearranged in terms of the later Indian varṇamālā system:

a
ka ḱa   kha   ga   gha
ca ĉa   cha   ja   za   ña
ṭa   ḍa   ḍha   ṇa
ta   tha   da   dha   na
pa   pha   ba   bha   ma
ya   ra   la   va vha
śa śpa   ṣa   sa spa
ha
kṣa tsa ṭha ṭ́ha sta ṭa

The Kharoṣṭhī writing system has four vowel mātrās: **e**, **i**, **o**, **u**. Initial vowels are written by combining the base sign **a** with these vowel mātrās. Kharoṣṭhī also provides an anusvāra sign, and later forms of the script occasionally use a marker for long vowels. Four special strokes are used to mark preconsonantal **r**, postconsonantal **r**, postconsonantal **v** and postconsonantal **y**. The first three of these are secondarily used by some scribes to mark phonetic distinctions that the base signs of Kharoṣṭhī do not capture: The 'preconsonantal **r** diacritic' marks consonant length or a cluster. The 'postconsonantal **r** diacritic' marks weakening of consonants and is conventionally transliterated as a subscript line (e.g., **śamaṣa** for [çəməzə]). The 'postconsonantal **v** diacritic' marks consonant length or a cluster and it is suggested to transliterate it as a circumflex accent (e.g., **praŝa** for [prəsnə]). To avoid some of the ambiguity of these various diacritics, a superscript line eventually came to be used to mark consonant length or a cluster. In the middle period of Kharoṣṭhī (1st c. BCE to 2nd c. CE), several orthographic systems competed with each other. The main division is between minimal systems that use as few signs as possible and do not systematically write anusvāra (e.g., that of the scribe of BL Verse Commentary II), and phonetically precise systems that make extensive use of diacritics and anusvāra to capture the pronunciation of Gāndhārī (e.g., that of the scribe of the BL Saṃgītisūtra commentary). The following table illustrates how Gāndhārī sounds and Kharoṣṭhī signs map to each other in these two main systems. In the last phase of Gāndhārī use in South Asia

(3rd c. CE), Sanskritization became a major linguistic force, and this is reflected in the Kharoṣṭhī writing system of the time by numerous Sanskritic spellings and the introduction of new consonant conjuncts imitating those of Brāhmī.

sound	Nird^{L2}	SaṅgCm
a	a	a
i	i	i
u	u	u
e	e	e
o	o	o
p	p	p
pʰ	ph	ph
b	b	b
bʱ	bh	bh
t	t	t
tʰ	th	th
d	d	d
dʱ	dh	dh
ʈ	ṭ	ṭ
ɖ	ḍ	ḍ
ɖʰ	ḍh	ḍh
tɕ	c	c
tɕʰ	ch	ch
dʑ	j	j
k	k	k
kʰ	kh	kh
g	g	g
gʱ	gh	gh
m	m	m, ṃ
mʱ	m	m, m̂
n	ṇ	ṇ, ṃ
nʱ	ṇ	ṇ
ɳ	ṇ	ṇ
ɲ	ñ	ñ, ṃ
ŋ	—	ṃ

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sound	Nird[L2]	SaṅgCm
ð	**d**	**t̲**
s	**s**	**s**
z	**s**	**s̲**
ṣ	**ṣ**	**ṣ**
ẓ	**ṣ**	**s̲̣**
ç	**ś**	**s̲̄**
ʝ	**ś**	**ś̲**
ɾ	**r**	**r**
ɽ	**ḍ**	**ḍ̲**
ɽʱ	**ḍh**	**ḍ̲h**
ʋ	**v, Ø**[1]	**v**
ʋʱ	**v**	**vh**
ṽ	**m, Ø**	**m, v, ṃ**
l	**l**	**l**
j	**y, Ø**[2]	**y, k̲**[3]
ɦ	**h**	**h**

Special Signs for Length and Clusters:

sound	Nird[L2]	SaṅgCm
ts	**ts**	**ts**
tʰː	**ṭh**[4]	**ṭh**
ʈʂ	**kṣ**	**kṣ**
çtɕ	—	**ĉ**
mʱː	—	**m̂**
st	**st**	**st**
sp	**sp**	**śp**
sn	**s̄**	**ŝ**
ʂɳ	**ṣ̄**	**ṣ̄**
çp	**sp**	**śp**
ʝː	**ȷ̄**	**ĵ**

5   Further Reading

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[1]Between **o** or **u** and another vowel.

[2]Between **e** or **i** and another vowel.

[3]When from OIA intervocalic *k* or *g.*

[4]When from OIA intervocalic *sth* or *rth.*

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See also the volumes in the Gandhāran Buddhist Texts series (University of Washington Press), each of which contains grammatical sketches of the texts in questions.