PĀṆINI IS SLICK, BUT HE ISN'T MEAN

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1 Introduction

COMPLETENESS and ECONOMY are rightly considered the two main goals of Pāṇini's grammar. But, within the constraints imposed by these two dominant principles, the grammar is also in many respects designed to maximize USER-FRIENDLINESS. Its reputation of being impenetrable is quite undeserved. Of course it is a very complex work, but the complications are those of the language itself and of the brevity with which the analysis is presented. Examples of user-friendliness include the systematicity and consistency of the *saṃjñā* system (Kiparsky [1979: Ch. 6] Ó Séaghdha [2004]) and the avoidance of vacuous overgeneralization (the SPECIFICITY property demonstrated for the phonological *pratyāhāras* in Kiparsky [1991]).

In this paper I shall argue for another user-friendly feature, AUDIBILITY. By this I mean that Pāṇini avoids silent elements in rules. It could be also called the "what you hear is what you get" (WYHIWYG) property. The apparent exceptions to audibility will be argued to be later reinterpretations.

The *Mahābhāṣya* bears witness to a transitional period when grammarians continued to debate revisions to the *Aṣṭādhyāyī* but were increasingly reluctant to execute them. At this time, grammarians increasingly resorted to an interesting intermediate strategy of COVERT REVISION, or REPARSING. It amounts to reconstruing the wording of the text without changing the way it is pronounced, or, usually, even the way it is written. Relatively few reparsings, and none of the ones considered here, are inadvertent side effects of oral transmission. For a work that was traditionally handed down without breaks between words, and even recited with the rules themselves run together, the

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Aṣṭādhyāyī was transmitted with remarkable fidelity.[1]

A common type of reparsing is splitting a rule into two (*yogavibhāga*, one of Patañjali's favorite solutions to interpretive quandaries). Sometimes the constituent structure of an expression in a rule is reanalyzed.[2] Less often, it is proposed to redraw the boundary between rules.

Another type of reparsing exploits sandhi rules to read covert sounds into the text in positions where they cannot be pronounced, usually either vowel contraction (*praśliṣṭanirdeśa*) or consonant deletion (degemination). Cases of the latter type are the focus of this article.

The posited inaudible consonants have two main functions. Some are diacritic markers (*anubandhas*) which are read into certain morphemes in order to give them the desired grammatical behavior. Such cases include the marker *G* that is read into *-kṣnu* in 3.2.139, *kñiti* in 1.1.5, and *kiti* in 7.2.11, and the marker *Ḍ* that is read into *at* in 7.1.15. Others are actual phonemes which allow the rules of the grammar to work properly in derivations. Examples are the additional initial *c* read into *chvoḥ* in 6.4.19, and the initial *y* read into suffixes such as *-cuñcuP* and *-canaP* in 5.2.26.

These readings are not mentioned by Kātyāyana, but they have been accepted as authentic by the tradition since Patañjali. Scholars who approach Pāṇini from a historical/philological or linguistic point of view tend to regard them as commentator's artifices (Kielhorn [1887], Böhtlingk [1887], Scharfe [1989], Kiparsky [1991], Joshi and Roodbergen [2002]). Cardona [1988] objected to this view, and in the preface to the 1997 edition of his work he responds to his critics and reaffirms the position that these readings are correct reconstruc- tions of Pāṇini's intentions. I shall review the evidence, and conclude that it clearly contradicts Cardona, and shows that all these readings are the result of reparsings by later grammarians.

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1 An example of erroneous transmission would be the rules 5.3.12 **kimo 'd**, 13 **vā ha ca cchandasi**, if I am right that they have been reparsed from original 12 **kimo 'd vā**, 13 **ha ca cchandasi** (Kiparsky [1979:66], Joshi and Bhate [1984: 245]). Most reparsings are carefully considered and often extremely ingenious refinements of the grammar, which allow Patañjali to propose reformulations of rules even while crediting Pāṇini with them (**kriyate nyāsa eva**), and claiming to be merely interpreting him.

2 E.g. in 1.1.58 Patañjali proposes to reconstrue *vare-yalopa* 'deletion of *-ya* before *-vara*' either as as *vare-'yalopa* 'deletion of *a* and of *-ya* before *-vara*' or as *vare*, *yalopa* 'deletion of *-ya* and deletion before *–vara*'.

Let us begin with rule (1) 6.4.19.[3]

(1) 6.4.19 **chvoḥ śūḍ anunāsike ca**
'Before endings with the markers *K* and *Ṅ* beginning with obstruents and nasals, *-ch* and *-v* are replaced by *-ś* and *ūṬH*, respectively.'

Patañjali proposes to read *cchvoḥ* (i.e. *t-chvoḥ*) for *chvoḥ*. The purpose is to get (1) to interact correctly with rule (2) in the derivation of *praśna* 'question'.

(2) 6.1.73 **che ca**
'The augment *tUK* is inserted after a short vowel before *ch* in close contact.'

The correct output requires that (1) should take effect before (2). From Patañjali's point of view, this is a problem. According to the *antaraṅga*-paribhāṣā, internally conditioned (*antaraṅga*) rules have priority over externally conditioned (*bahiraṅga*) rules, or, in another formulation, externally conditioned rules are *asiddha* 'not effected' with respect to internally conditioned rules. Either version requires the incorrect derivation in (3):

(3) prach-naṄ	3.3.90 (see (25) below)
prach-na	(9), (11) (see below)
praś-na	(1) 6.4.19 **chvoḥ śūḍ anunāsike ca** (*bahiraṅga*)
*pratś-na	(2) 6.1.73 **che ca** (internally conditioned, so should apply first by the *antaraṅga*-paribhāṣā)

Patañjali proposes to reconcile the rules of the grammar with the *antaraṅga*-paribhāṣā by rephrasing rule (1) as **cchvoḥ** ..., where *cch* is the pronunciation of *tch*. Rewritten in this fashion, it replaces the entire *-tch-* sequence resulting from (2), and the correct form is derived even if the *antaraṅga*-paribhāṣā is allowed to dictate the order of rule application:

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3 There is a question whether the condition that the suffix have the marker *K* or *Ṅ* extends to the suffixes with nasals. See Joshi and Roodbergen [2002: 55-57], who point out that Pāṇini must have intended that it does, because his formulation of 8.2.36 would be pointless otherwise.

(4) prach-na

pratch-na	(2) 6.1.73 **che ca** (*antaraṅga*)
praś-na	(1) 6.4.19 (reformulated version) **cchvoḥ śūḍ anunāsike ca** (*bahiraṅga*)

Now the *antaraṅga* rule feeds the *bahiraṅga* rule.

In earlier work (Kiparsky [1982], Joshi and Roodbergen [1987], Joshi and Kiparsky [MS]) we have argued that the *antaraṅga-paribhāṣā* as traditionally formulated is not operative within words in Pāṇini's grammar. We showed that there is much evidence against it, and none for it.[4] Rather, the main "traffic rule" of the grammar is the *siddha-* principle, which, simply put, maximizes rule interaction. The *siddha-* principle subsumes, among other things, a generalized form of the traditional *nitya*-principle. In the derivation at issue, the *siddha-*principle predicts the correct form. Starting from the stage *prach-na*, the derivation continues:

(5) prach-na

praś-na	(1) 6.4.19 **chvoḥ śūḍ anunāsike ca** (takes effect first because it bleeds (2))
——	(2) 6.1.73 **che ca** ((1) is *siddha* now)

If the original text of the *Aṣṭādhyāyī* had *chvoḥ* ..., and the reading *cchvoḥ* ... is due to Patañjali, as Böhtlingk concludes in his edition of Pāṇini, this supports the conclusion that Pāṇini determined the interaction of word-internal processes by the *siddha*-principle, and not by the *antaraṅga-paribhāṣā*, as Patañjali did.

Cardona returned to the question in the second edition of his work [1997: xv] and defended the reading with the extra *t* (*cchvoḥ*), but gave no arguments for it. He gave some non-arguments, however, based on two other rules, (6) 7.4.11 and (7) 3.1.36.

(6) 7.4.11 **ṛcchaty ṛtām**
'*Guṇa* replacement applies in the perfect (9 *liṭi*) to *ṛcch*, *ṛ*, and roots in *ṝ*.'

(7) 3.1.36 **ijādeś ca gurumato 'nṛcchaḥ**

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4 Its valid core is that word-internal operations have priority over operations that cross word boundaries.

> 'The suffix *-ām* is added in the perfect (35 *liṭi*) after heavy roots that begin with a vowel other than *a* (*iC*), except for *ṛcch.*'

How might these rules provide evidence for the reading *cchvoḥ* in (1) 6.4.19? Do they presuppose or require that reading somehow? Or is there some otherwise unnecessary complication in their formulation that serves as a clue to reveal it? Cardona does not attempt to show any such thing. Here is Cardona's argument in full (internal cross-references omitted):

> Now consider the formulation of **A** 3.1.36. The rule explicitly excludes the verb *ṛch.* If, then, Pāṇini did not state ... *anṛcchaḥ*, *ṛch* would be eligible to receive the affix *-ām.* After the L-affix of *ṛch-l* (*liṭ*) is replaced by the ending ***ṇal*** and before doubling, two operations are possible: ***tuk*** is added or guṇa substitution applies by **A** 7.3.86. If the augment is added (*ṛch-a* → *ṛtch-a*), replacement cannot apply, since the penult of the base is now not a light vowel; and if guṇa substitution takes effect *ṛch-a* → *arch-a*), the augment cannot be added, because *ch* is now not preceded by a vowel, since the guṇa vowel *a* which replaces *r* is automatically followed by *r.* Thus both possible operations are anitya, so that the principle whereby a nitya operation takes precedence over one that is anitya cannot decide what should be done. On the other hand, if an internally conditioned operation takes precedence over one that is externally conditioned, a decision is possible: In ((*ṛch*)-*l*) or ((*ṛch*)-*a*), doubling of the base would be conditioned by the affix, but addition of the augment ***tuk*** is internally conditioned, by *ch* occurring after a light vowel. This operation thus takes precedence. Accordingly, Pāṇini has to make special provision for guṇa replacement to allow deriving forms like *ānarccha*: 7.4.11. One could claim that the rule is needed for forms like *ānarcchatuḥ* in any case. This does not, however, get around that fact that Pāṇini has to make a special provision to keep *-ām* from being introduced. For, if 3.1.36 were simply *ijādeś ca gurumataḥ*, this rule would allow *-ām* to follow *ṛtch.* Hence, the rule is formulated with *anṛcchaḥ.* It would seem, then, that in this case Pāṇinīyas are not up to any strange trickery imputing anything to Pāṇini which is not to be inferred from what he says. (1997: [xv-xvi]).

There is literally no argument here. Clearly rules (6) and (7) work just as well if (1) 6.4.19 is read simply with *chvoḥ*. And both rules are justified as they stand even if (1) 6.4.19 is read simply with *chvoḥ*. Rule (6) is required because (as Cardona himself notes) the verbs it mentions, including *ṛcchati*, undergo *guṇa* substitution before *all* perfect endings, not just before the singular endings as is usually the case. And rule (7) is obviously required as well, and the explicit exclusion of the root *ṛch* in it (*anṛcchaḥ*) is justified because it settles a conflict between two rules applicable to *ṛch-a*: the substitution of *guṇa* for the light penult by (16), and the insertion of the augment *t* by (2) 6.1.73 **che ca**, which as Cardona himself notes, it is not adjudicated by the *nitya*-principle (or by the *siddha*-principle for that matter). These rules, therefore, provide no support for the reparsing of (1).

Cardona also reiterates that the reading *cchvoḥ* in (1) 6.4.19 is required if the *antaraṅga*-paribhāṣā is assumed. But this is an argument *against* the reading, not for it. You can't support dubious claims by showing that they follow from, or entail, other equally dubious claims. On the contrary, that makes them weaker still. Our refutation of the *antaraṅga*-paribhāṣā eliminates the only shred of evidence for the suspect reading *cchvoḥ*. This is, in fact, of the many welcome results of abandoning the *antaraṅga*-paribhāṣā.

For some reason, Cardona devotes most of his discussion of these devices to arguing that, under certain assumptions about how the grammar works, they are needed to make derivations work. Of course they are! As far as I know nobody has ever claimed that the commentators' interpretive artifices are without purpose. Grammarians did not add geminates to rules and redivide them just to amuse themselves. The changes they made were necessary from their point of view: otherwise they would have kept the grammar as Pāṇini left it. Not only are the proposals carefully thought through, many of them are stunningly clever. But to attribute them to Pāṇini himself on these grounds would be to miss the point completely. The reason for believing that they are later workarounds is not that they are pointless or inept — they are not — but that they are post-Pāṇinian in style and technique, and uncharacteristically obscure and ambiguous. Whoever introduced the reparsing in preference to a more authentically Pāṇinian treatment must have done so because they were reluctant to change the existing text. They faced the task of correcting a residue of

minor technical problems that were found after Pāṇini's wordin had already become canonical, so that an appropriate reformulation of the rules was out of the question.

As background to my discussion of the two "ghost markers" I review in the next section some of the basics of Pāṇini's marker system. Readers familiar with the topic may wish to skip it and proceed directly to section 3.

2 The main features of markers

Markers are attached to morphemes to encode their unpredictable grammatical properties, and sometimes just to distinguish between homonymous morphemes or to allow classes to be formed by the *pratyāhāra* technique. They are deleted in actual pronunciation and are not part of the phonological representation at any stage in the grammatical derivation. By cleverly exploiting the phonotactic restrictions of Sanskrit they have been chosen in such a way that potential confusion with real phonemes is kept to a minimum. In fact, the inventory and distribution of markers is based on an accurate analysis of Sanskrit morpheme structure, an aspect of the language that Pāṇini's rules do not explicitly cover.

Nazalization of vowels is a strictly allophonic feature, so nasal vowels are available as markers:

(8) 1.3.2 **upadeśe 'c anunāsika it**
'A nasal vowel in the lexical (input) representation is a marker.'

(The nasalization is however not written or recited nowadays). Roots that end in consonants are converted into vocalic stems by adding a nasal vowel, and affixes usually end in vowels, except that some inflectional endings end in coronals and in *-m*.[5] With these limitations, accurately reflected in (9b), final consonants are designated as markers by (9a):

(9) a. 1.3.3 **hal antyam**
'A final consonant in the lexical representation is a marker.'

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5 A few others, such as *-in*, are given an extra nasal vowel at the end in order to protect their final consonant from becoming a marker by (9a).

b. 1.3.4 **na vibhaktau tusmāḥ**
'At the end of inflectional endings, dental stops, *s*, and *m* are not markers.'

In initial position, the markers are (a) *ñi-*, *ṭu-*, *ḍu-*, (b) *ṣ*, (c) palatal and retroflex stops in suffixes, and (d) *l*, *ś*, and velars in (non-*taddhita*) suffixes.

(10) a. 1.3.5 **ādir ñiṭuḍavaḥ** (1.3.2 it)
'Initial *ñi-*, *ṭu-*, and *ḍu-* are markers.'
b. 1.3.6 **ṣaḥ pratyayasya**
'*ṣ* at the beginning of a suffix is a marker.'
c. 1.3.7 **cuṭū**
'A palatal or retroflex stop at the beginning of a suffix is a marker.'
d. 1.3.8 **laśakv ataddhite**
'*l*, *ś*, and a velar stop at the beginning of a non-*taddhita* suffix is a marker.'

Here again the marker system exploits gaps in the distribution of phonemes.

Markers are deleted by (11) 1.3.9, although their grammatical effects remain in force.

(11) 1.3.9 **tasya lopaḥ**
'It is deleted.'

In addition, the three accents are used on verb roots to mark their use of the middle voice. (Like nasality, accents are not ordinarily pronounced in citing forms, but we know where the accents are supposed to be.) The use of accents as markers is possible because, in Pāṇini's analysis, root accent is not distinctive in lexical representations, though roots can get accented by rules depending on the suffixes with which they combine.

The need to avoid confusion with real phonemes greatly reduces the number of available markers. In addition, the use of the aspirate consonants *kh*, *gh*, *ch*, *jh*, *ṭh*, *ḍh*, *ph* as markers is in certain contexts pre-empted by their function in those contexts as abbreviations for a number of common longer suffixes, which are substituted for them at

the beginning of the derivation. Within the limits of these restrictions, almost all available sounds have been pressed into service as markers. Many do double or multiple duty, being assigned different functions in different contexts. They encode fairly general grammatical properties of morphemes, so that they achieve the maximum simplification of the system. No marker is introduced for the sake of a single morpheme. Their primary function is to capture morphological generalizations, as when several morphemes have the same special behavior, or the same range of special behaviors.

The markers that encode the shared morphological features of the tense/mood categories illustrate how the markers express generalizations about classes of morphemes. The fact that future tense and the conditional mood have the same stem-marking morpheme *-sya* is captured by assigning them the names *lṚṬ* and *lṚṄ*, and letting the introduction of *-sya* be conditioned by the marker *-Ṛ-* that they uniquely share. (Here and below I capitalize markers in citing morphemes). The fact that the conditional mood *lṚṄ* also shares morphological properties with optative mood, imperfect tense, and aorist tense (for example, the so-called secondary endings) is captured by assigning these the respective names *lIṄ*, *lAṄ*, and *lUṄ* and letting the rules responsible for their shared morphology be triggered by the marker *-Ṅ* that all four categories uniquely share (rules 3.4.99 ff.). The fact that future tense (*lṚṬ*) also has unique morphological properties in common with the present, the perfect, the remote future, the subjunctive, and the imperative, is captured by assigning these the respective names *lAṬ*, *lIṬ*, *lUṬ*, *lEṬ*, *lOṬ*, and letting the rules responsible for their shared morphology be triggered by the marker *-Ṭ* that all six of them share (rules 3.4.79).[6]

Markers such as *K*, *Ṅ*, and *P* encode a considerable range of special behaviors shared by classes of morphemes. Suffixes with *K* and trigger a number of stem changes (this is an entirely different function of *Ṅ* than the tense-classifying function outlined in the preceding paragraph). Here are a few important ones; others will be added as they become relevant in the discussion that follows.

(12) Vocalization of semivowels, e.g. *vac-Kta* → *ukta* 'said'.

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6 These markers play a role only in the morphology. They are not suited for handling the *functional* affinities among the ten abstract tense/mood affixes. Instead, these are captured by grouping the rules that introduce the affixes under common headings.

a. 6.1.15 **vacisvapiyajādināṃ kiti**
'The semivowel of the roots *vac* etc. is replaced by *saṃprasāraṇa* before a suffix marked with *K*.'

b. 6.1.16 **grahijyāvayivyadhivaṣṭivicativṛścatipṛchhatibhṛjjatīnāṃ ṅiti ca**
'The semivowel of the roots *grahi*, *jyā*, *vayi*, *vyadhi*, *vaṣṭi*, *vicati*, *vṛścati*, *pṛchhati*, *bhṛjjati* is replaced by *saṃprasāraṇa* before a suffix marked with *K* or *Ṅ*.'

(13) Prenasal vowel lengthening, e.g. *śam-Kta* → *śānta* 'calmed'.
6.4.15 **anunāsikasya kvijhaloḥ kṅiti**
'The vowel of a base ending in a nasal is lengthened before *-KvIP* and before a suffix which begins with an obstruent and which is marked with *K* or *Ṅ*.'

(14) Presuffixal vowel lengthening, e.g. *ci-yaK-te* → *cīyate* 'is stacked' (3Sg. Pass.).
7.2.25 **akṛtsārvadhātukayor dīrghaḥ**
'The final vowel of a base is lengthened before a suffix which is not a *kṛt* or *sārvadhātuka*. and which begins with *y* and is marked with *K* or *Ṅ*.'

Another function of the markers *K* and *Ṅ* is to block the suffixes that bear them from causing *guṇa* and *vṛddhi* strengthening by 7.3.84 **sārvadhātukārdhadhātukayoḥ** and following rules, due to the prohibition (17) 1.1.5.

(15) 7.3.84 **sārvadhātukārdhadhātukayoḥ**
'Before *sārvadhātuka* and *ārdhadhātuka* suffixes, the last segment of a base is replaced by (*guṇa*).'

(16) 7.3.86 **pugantalaghūpadhasya ca**
'Before *sārvadhātuka* and *ārdhadhātuka* suffixes, the light penult of a base, or the penult of a base ending in *pUK* is replaced by *guṇa*.'

(17) 1.1.5 **kṅiti ca**
'*Guṇa* and *vṛddhi* are not substituted (for *i*, *u*, *ṛ*, *ḷ*) before an

element marked with *K*, *Ṅ*.'

The marker *P* is partly antagonistic to *K* and *Ṅ*. One of its functions is to allow affixes to trigger *guṇa* and *vṛddhi* strengthening, by preventing them from getting the marker *Ṅ* which blocks that strengthening by (17):

(18) 1.2.4 **sārvadhātukam apit**
'A *sārvadhātuka* which does not have the marker *P* has the marker *Ṅ*.'

Another function of *P* is to prevent the affix that bears it from getting accented.

(19) 3.1.4 **anudāttau suppitau**
'Case-number endings and endings marked with *P* are unaccented.'

In this way the *K*—*Ṅ*—*P* subsystem of markers expresses the generalization that weakening processes like (12)—(14) and the blocking of (15)—(16) by (17) typically happen in unaccented syllables. At the same time, it does justice to the synchronically morphologized character of these stem-changing and accentual processes, which causes the correlation between them to be partial and crossed by numerous subregularities.

In addition to the markers' primary function of generalizing across classes of morphemes and classes of processes, they are used to distinguish lookalike morphemes in order to allow them to be identified easily in rules. For example, the aorist suffixes *aṄ* and *CaṄ* have in common the properties triggered by *Ṅ* (such as blocking strengthening, see (17)), but *CaṄ* has a number of idiosyncrasies which require it to be singled out in many rules. So that this can be done handily, it has been assigned the marker *C*. The usual function of this marker is to attract accent to the affix that bears it, but here that function is redundant because (like *aṄ*) *CaṄ* would get accented anyway by other rules of the system even if it had no *C*. So, the redundant C has been co-opted to provide a distinctive name for this particular ending. Similarly, the *kṛt* suffixes *aṆ* and *Ṇa* are individuated just by the placement of the marker. The four case

endings pronounced *-as* are Gen.Sg. *Ṅas* and Abl.Sg. *ṄasI*, where *Ṅ* functions to trigger various morphological replacement processes, and Acc.Pl. *Śas* and Nom.Pl. *Jas*, where the marker has only an identificatory function. In fact, *J* is a unique case of a marker which is not used elsewhere at all; otherwise identificatory markers are recycled uses of markers which do more substantial work elsewhere in the system.

Finally, markers are used to form of *pratyāhāras*, condensed expressions that represent a continuous segment of a list by the first item plus the marker that follows the last. The best-known use of *pratyāhāras* are the designations of phonological classes formed from the Śivasūtras (Kiparsky [1991], Petersen [2003]); important morphological uses of the same technique are terms like *tiṄ* (finite person/number ending) and *suP* (nominal case/number ending).

Pāṇini takes considerable care to choose and place his markers so that they will be unambiguously distinct and recognizable (Devasthali [1967], Scharfe [1971: 20 ff.]). Markers in word-final position illustrate this point well. They are selected in such a way that they will not be obscured by final devoicing and deaspiration and other *sandhi* processes. For example, although any final consonant is defined as a marker (by (9) **hal antyam**), only one stop from each place of articulation is ever used in that position, namely the stop of the voiceless unaspirated series *k*, *c*, *ṭ*, *t*, *p*. Stops of the other three series occur as markers only morpheme-initially. And even there, only those stops are used which do not run the risk of being confused with real phonemes, namely *kh*, *gh*, *ḍ*, and only in the types of morphemes where they do not occur in that position. There is no final marker *-h*, presumably because *h* never occurs in word-final position in the language.[7]

Not only the inventory of markers but also their placement in morphemes is carefully optimized. Consonantal markers are attached to the vocalic edge of a morpheme if possible, and unpronounceable clusters are wholly eschewed (e.g. the marker *L* is attached to the end of *-tra* rather than the beginning, since the marker is pronounceable in *-traL* but not in **-Ltra*). When a morpheme has two consonantal

7 On the other hand, *-Ṣ*, *-Ś*, and *-Ñ* are tolerated as markers in final position, e.g. in *jhaṣ* and *jhaś* (the *pratyāhāras* which respectively abbreviate the class of voiced aspirated and unaspirated stops), and in endings like *ṄiṢ*, *GHaÑ*. These segments don't occur prepausally but (unlike *h*) they do occur word-finally in sandhi contexts.

markers, one is always attached at the beginning and the other at the end (e.g. *ṆyaṬ*, *KyaṄ*, *ŚānaC*). Unpronouncable clusters are eliminated by epenthetic *i* or *u*, with nasalization for the sake of (8) (no longer written or pronounced), e.g. *dhyamUÑ* (5.3.44), *ÑIṭha* (4.2.116). No morpheme has more than two consonantal markers.

The same thoughtful approach is seen in the way markers are mentioned in rules, as the following example illustrates. Rule 7.1.70 specifies items (other than roots) with the markers *U* and *Ṛ*, and the suffic *-ac*. This is done with the expression *ug-id-ac*, a compound of *uk-id* 'having an *uK* sound as a marker' and *-ac*. The rule indicates the relevant sounds with the *pratyāhāra uK* rather than naming them directly with the compound *u-ṛ-ac*, which would be pronounced **v-r-id-ac*, one syllable shorter but ambiguous.

In a few instances, the grammatical tradition posits "ghost" markers, unpronounced and unpronounceable, contrary to the generalizations just offered. I shall argue that all of them are later reparsings.

3. The ghost marker G

A much debated rule in the recent literature is (17) 1.1.5 **kṅiti ca**, which blocks strengthening before suffixes endowed with the markers *K* and *Ṅ*. Rule 1.1.5 is traditionally parsed as **g-k-ṅ-iti ca**, where *g-k-ṅ* is reduced to *k-ṅ* by the application of three phonological rules (Sharma [1990:10]).

(20) gkṅ-

kkṅ-	8.4.55 **khari ca** (voicing assimilation)
kṅṅ-	8.4.45 **yaro 'nunāsike 'nunāsiko vā** (nasal assimilation)
kṅ-	8.4.64 **halo yamāṃ yami lopaḥ** (degemination)

The reason for reparsing *kṅiti* as *gkṅiti* has to do with a problem in the derivation of the word *sthāsnu*. It is formed with the suffix *-Ksnu* by rule 3.2.139:

(21) 3.2.139 **glājisthaś ca ksnuḥ**
'The roots *bhū*, *glā*, *ji*, *sthā* take the suffix *-Ksnu*.'

The suffix *-Ksnu* does not trigger *guṇa* strengthening by (15) because its marker *K* activates the prohibition (17) 1.1.5 **kṅiti ca**. Hence we derive the desired forms *jiṣṇu* and *bhūṣṇu*, without *guṇa*, instead of **jeṣṇu* and *bhaviṣṇu*.[8] So far so good. But now *sthāsnu* is a problem. The *K* of *-Ksnu* will not only block strengthening, but also trigger an unwanted weakening of *sthā-* to *sthī-* by rule (22) 6.4.66,

(22) 6.4.66 **ghumāsthāgāpājahātisāṃ hali**
'The final segment of the listed roots *dhā*, *dā* (= *ghu*), *mā* ... is replaced by *ī* before a consonantal *ārdhadhātuka* ending marked with *K* or *Ṅ*.

So, instead of *sthāsnu* we would derive **sthīṣṇu*. A clever idea now comes to the rescue, involving the following moves: (*1*) posit a marker *G* on this suffix, which blocks strengthening just as *K* and *Ṅ* do, but unlike them does not trigger weakening by 6.4.66, (*2*) read the suffix *-Ksnu* as *-Gsnu*, with devoicing by 8.4.55 **khari ca**, and (*3*) construe *kṅiti* in 1.1.5 as *g-k-ṅ-iti*. This correctly derives both *sthāsnu* (no weakening) and *jiṣnu*, *bhūṣṇu* (no strengthening). This ingenious interpretation has been recently rejected by several authors.[9] Cardona [1997: xiii] reiterates the traditional view, and criticizes the sceptics for rejecting it without justification.

Is the change of *-Ksnu* to *-Gsnu* a true reconstruction of Pāṇini's intent, as Cardona maintains, or is it a later workaround, as others believe? I think there is no question that it is the latter, because it fits poorly into Pāṇini's grammatical system and, in a kind of Pinocchio's nose effect, it requires still other changes in the traditional text.

First, it makes 7.2.11 is inapplicable to the suffix, so that the previously straightforward form *bhūṣṇu* becomes underivable.

(23) 7.2.11 **śryukaḥ kiti**
'The augment *iṬ* is not inserted before a suffix with the marker

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8 The reason why form that would be derived if *-Ksnu* did not have the marker *K* is *bhaviṣṇu* rather than **bhoṣṇu*, is because the suffix would then get the augment *i* and would not trigger *guṇa*. Actually, *bhaviṣṇu is* an option in Vedic, but in virtue of the suffix *iṣṇuC* which is taken care of by the preceding rule 3.2.138. These intricacies are not directly relevant here. The main point is that not only *bhaviṣṇu* but also *bhūṣṇu* must be derivable, and this requires blocking of *guṇa*.

9 Scharfe [1989], Kiparsky [1991]. Joshi and Roodbergen [1991] evidently consider it not even worth mentioning.

K after *śri* and roots in *u*, *ū*, *ṛ*, and *ṝ*.'

Rule (23) needs to apply to *-ṣṇu* in order to block it from getting the augment *i-* after *bhū-*, but if *-ṣṇu* has the marker *G* it can't do that. So *bhū-Gsnu* will get the augment *i-*, and surface as *bhaviṣṇu* (fn. 8). Therefore, to derive *bhūṣṇu* under the assumption that the suffix is *-Gsnu*, it is necessary to reformulate also (23) 7.2.11 **śryukaḥ kiti** so that it applies before *G* as well as before *K*, viz. as ***śryukaḥ gkiti**.

The attentive reader may have noticed a technical problem with the order in which the rules are applied in (20). To derive *kṅiti* from *gkṅiti* we have to apply the voicing assimilation rule 8.4.55 *before* the nasal assimilation rule 8.4.45. But that is prohibited by 8.2.1 *pūrvatrāsiddham*, which forces them to apply strictly in the order listed, without ever going back. As can be seen from the derivation in (24), this order of rule application would turn an underlying **g-k-ṅ-iti** into ***gṅiti**, a form which is perfectly pronounceable, so it should show up in the rule. Yet it is wholly without textual support.

(24) *gkṅ-*
gṅṅ- 8.4.45 **yaro 'nunāsike 'nunāsiko vā**
— 8.4.55 **khari ca**
gṅ- 8.4.64 **halo yamāṃ yami lopaḥ**

Moreover, 8.4.45 and 8.4.64 are both optional (*vā*). Therefore, the grammar predicts two additional pronunciations, ***gṅṅiti ca** (derived by choosing not to apply 8.4.64). and ***kkṅiti ca** (derived by choosing not to apply 8.4.45, in which case 8.4.55 must take effect and 8.4.64 is inapplicable). In a system where even obligatory rules are sometimes suspended in the metalanguage in order to avoid undesirable ambiguity, there would be all the more reason to suspend *optional* rules for this purpose. But the *G*-theory implies that, instead of the three permissible pronunciations of rule 1.1.5, the text perversely chooses one which can't be derived by the rules of the grammar, and in which the marker is inaudible to boot. If there is no *G* there to begin with, it is no wonder that none is heard, and all is in order.

Worse, we would actually have to assume that Pāṇini has made a special effort to phrase his rule in such a way that the marker *G* can be hidden. For, if his intention had been to include *G* in (17) **kṅiti ca**, the rule could have been formulated more perspicuously by listing the

markers in a different order in the rule, either as ***k-ṅ-giti ca*** or as ***g-ṅ-kiti ca***. We would have to suppose that Pāṇini for some reason chose, out of all possible formulations of the rule, precisely the one in which the phonological rules will either delete *K* or make it indistinguishable from one of the other two markers, and then rejected all three of these phonological options in favor of an even worse one where *G* is deleted, and which violates his own rules.

Not only that, but the putative marker *G* is not audible in *any* rule of the grammar. It would be the only marker which never surfaces at all. Posited in three rules (1.1.5, 3.2.139, and 7.2.11), it happens to be deleted in each one — a strange coincidence.

These points are particularly weighty because Pāṇini is not in the habit of making his rules as obscure as possible. On the contrary, usually he tries to phrase them in the clearest possible way, within the limits imposed by the economy requirement, of course. The observations summarized in section 2 establish this for the marker system in particular. The marker *G* would stand as an exception.

The proposed use of the marker *G* fails to conform to Pāṇini's usual descriptive practice in another way as well. It would be a unique instance of a marker that has been introduced for the sake of a single suffix. Indeed, it would be a marker that has been introduced for the sake of a single *word*, namely *sthāsnu*. This is completely at odds with the usual style of the *Aṣṭādhyāyī*. As was discussed in section 2, the function of Pāṇini's markers is not to deal with exceptions but to express generalizations across classes of elements. Unique idiosyncrasies are listed as exceptions to rules, or, in extreme cases, cited ready-made in *nipātana* rules.

I conclude that the putative "ghost marker" *G* departs from Pāṇini's otherwise very lucid marker technique both technically and functionally. It is difficult to believe that he would have set up a construct so arcane and so out of step with the rest of his grammar for any purpose, and least of all for so meager a yield as deriving the word *sthāsnu*. It is much more respectful of the tradition to see *G* is the result of a reparsing from a time when the wording of the grammar had become fixed. Then it suddenly ceases to be a clumsy anomaly and can be appreciated as a brilliant *tour de force*, an adaptation of the existing text to deal with a newly discovered gap in descriptive coverage. It is an impressive hack, but it is not Pāṇini.

3.1 What could have been done

One conceivable way to reclaim Pāṇinian provenance for *G* would be to argue that *sthāsnu* is for some reason such a hard grammatical nut to crack that Pāṇini was *forced* to compromise his usual tidy technique, or that Pāṇini somehow got stuck and was unable to extricate himself without messing up something else in the grammar. Nothing of this sort is credible. In the first place, *if* Pāṇini had noticed the problem with *sthāsnu*, he could easily have dealt with it by following his normal method, and secondly, there are reasons why he might have overlooked the problem raised by this particular word.

Here is how the problem *could* have been dealt with in a style more consistent with the rest of the grammar. Recall that what needs to be done is just to restrict 6.4.66 **ghumāsthāgāpājahātisāṃ hali** so that it does not apply before *-Ksnu*. But exactly this restriction on 6.4.66 is already stated in the grammar for another suffix, *-LyaP*, in rule 6.4.69 **na lyapi**. It would have been a simple matter to extend this prohibition to *-Ksnu* by reformulating 6.4.69 as ***na ksnulyapoḥ**. Such prohibitions are the *Aṣṭādhyāyī*'s preferred method for dealing with individual lexical exceptions. The fact that this method was not used for *sthāsnu* indicates that the overapplication of 6.4.66 to this word (giving **sthīṣṇu*) had not been noticed when the grammar was originally put together.

3.3 What happened?

Having excluded the other alternatives we are left with one scenario, which common sense suggests anyway: that overapplication of (22) 6.4.66 to *sthāsnu* was not addressed until it was too late to change the wording of the rules as required. We may never be able to tell exactly how it happened, but we ought to be able to make it at least plausible that it did, under reasonable assumptions about how the grammar evolved.

Kātyāyana and Patañjali ferreted out quite a few such small inaccuracies, so we know that such things did happen. There are obviously no major errors — these could never have escaped notice — but there are minor slips and lacunae of a characteristic sort. One typical kind of case involves an unexpected rule interaction in a unique morpheme combination. An example is the word *praśna*

'question', whose derivation was discussed in (3)—(4). The morphological rule that forms it is (25):

(25) 3.3.90 **yajayācayataviccapraccharakṣo naṅ**
'*-naṄ* is added to the roots *yaj* etc. to denote a state (or event).'

The roots listed in (25) include *prach* 'ask', which by this rule gets the suffix *naṄ* to form the action noun *praśna* 'question' (with *-ch* → *ś* by 6.4.19). Unfortunately, *naṄ* has the marker *Ṅ* and rule (12b) 6.1.16 lists *prach* as one of the roots that undergo *saṃprasāraṇa* vocalization before suffixes with the marker *Ṅ*, which predicts the output **pṛśna*. None of the other roots listed in (25) are candidates for *saṃprasāraṇa*, and on the other hand the marker *Ṅ* has a huge range of other functions which cause no problem in *praśna*, so this mistake was all too easy to make. Any modern grammarian who tries to write explicit rules, or for that matter any computer programmer, is well familiar with the fact that "bugs" arise most commonly in rare unexpected combinations.

On the scenario that I propose, the case of *sthāsnu* is very similar. Rule (22) 6.4.66 replaces *-ā* by *ī* in certain roots before consonantal suffixes that have the marker *K* or *Ṅ*. It applies before such suffixes as Pass. *-yaK*, Mid./Pass.Intensive *-yaṄ*, Pp. *-Kta*, Absolutive *-Ktvā*, noun-forming *KtiN*, e.g. *gīyate* 'is sung', *jegīyate* 'is sung intensively', *gīta* 'sung', *gītvā* 'having sung', *gīti* 'song'. There are also aorist forms like *adhyagīṣṭa* 'he recited', from *adhi-iṄ* by 2.4.50. Two of the roots in this list, *sthā* 'stand' and *mā* 'measure', are however subject to a special rule which supersedes 6.4.66 and requires short *i* instead of long *ī* when the following suffix has the marker *K* and begins with *t*:

(26) 7.4.40 **dyatisyatimāsthām it ti kiti**
'Before a suffix that has the marker *K* and begins with *-t*, the final vowel of *dyati* (the root *do*) 'cut', *syati* (*so*) 'end', *mā* 'measure', and *sthā* 'stand& is replaced by *i*.'

Hence *sthita*, *sthitvā*, *sthiti*, rather than **sthīta* etc. So, the only *-ī* form of sthā that is actually used is the passive *sthīyate*.[10] Moreover,

[10] There are no aorists such **asthīṣṭa*, and the mediopassive intensive *teṣṭhīyate* 'is stood intensively' is not attested in usage and would be unlikely to occur in practice for semantic

sthā is the *only* root in *-ā* that takes *-Ksnu*. Again, a unique root plus suffix combination, *sthā-Ksnu*, gives rise to an unforeseen application of a rule, an understandable oversight.

3.3 Summary

In order to prevent the overapplication of rule (22) to *sthāsnu*, some grammarians propose to read rules 1.1.5, 3.2.139, and 7.2.11 with an inaudible marker *G*. This idea is a post-Pāṇinian innovation, dating from a time when the recited text of the grammar had become fixed. I have presented three arguments which converge on this conclusion. First, the use of the marker *G* is grossly un-Pāṇinian in a number of ways. Secondly, there is no real difficulty about *sthāsnu* that could have forced Pāṇini to stray so far from his own method; he could easily have treated it in his usual way. But, and this is the third point, what *is* special about *sthāsnu* is that it presents a unique context for rule (22). This might have gone undetected until the text had become canonized, at which point someone, Patañjali or possibly an earlier grammarian, cleverly fixed the problem without changing so much as a single sound in the text.

4 The case of aḍ

The neuter inflection of five pronominal stems has the special wrinkle that the Nom./Acc. Sg. ends in *-at* rather than *-am*. This is taken care of by rule (27).

(27) 7.1.25 **aḍ ḍatarādibhyaḥ pañcabhyaḥ**
'After the neuter nominal bases *-ḍatara*, *-ḍatama*, *itara*, *anya*, *anyatara*, the Nom.Sg. *-sU* and Acc.Sg. *-am* are replaced by *at*.'

(Technically, the replacement could be *ad* instead of *at*, which would be pronounced the same way in the rule and also produce identical outputs.) Kātyāyana's and Patañjali's text had the rule as given in (27), and that is how Böhtlingk prints it in his edition. But it is commonly printed as *aḍḍ*, where the second *ḍ* is the marker *Ḍ*. The sequence *atḌ ... ḍ* would be reduced to *aḍ* by the word-final cluster simplification

reasons (though it may have been grammatical).

rule (28) and by voicing assimilation.

(28) 8.2.23 **saṃyogāntasya lopaḥ**
'The last consonant of a word-final cluster is deleted'.

The reason for positing the marker *Ḍ* on *at* is to solve a problem in the derivation of forms like *katarat* from Nom. *katara-sU* and Acc. *katara-am* 'which one (among two)?'. The straightforward replacement of *-sU* and *-am* by *at* would yield *katara-at*, which would become *katarāt* by rule (29):

(29) 6.1.102 **prathamayoḥ pūrvasavarṇaḥ**
'*aK* (*a*, *i*, *u*, *ṛ*, *ḷ*) and a following vowel in a Nominative or Accusative case ending are (together) replaced by a long vowel of the same color as the first vowel.'

Adding the marker *Ḍ* avoids this because its triggers deletion of thestem-final-VC sequence by rule (30):

(30) 6.4.143 **ṭeḥ**
'The final *ṭi* (rhyme) of a *bha* stem is deleted before a suffix with the marker *Ḍ*.'

This causes the stem-final vowel to be deleted in *katara-at*, so the correct output *katarat* is obtained.

Supplying *aḍ* with *Ḍ* was suggested by Patañjali, and has been accepted by the tradition since then. Recently it has been endorsed by Cardona [1997: 323, 579-580] and by Joshi and Roodbergen [2003: 55], among others. I believe that *at* did not have the marker *Ḍ* in the original rule, and that Patañjali's proposal is a rereading, either original with him or borrowed from a now lost work. The reasoning is quite parallel to the previousone about *G*, so I will present it more briefly. It has three parts again: (1) the marker *Ḍ* is here used in a non-Pāṇinian way, (2) if the problem had been noticed while the grammar was still being composed, it could have been dealt with by a simple reformulation more in Pāṇini's style, (3) this is just the type of minor slip that could easily have arisen in the course of the many revisions that the grammar went through.

On the first point: we have already noted that Pāṇini makes a

special effort to keep markers away from those places in morphemes where they are bound to be deleted, or merged with other markers or with real sounds. Thus, in all other eighteen suffixes that have the marker *Ḍ*, it is placed at the *beginning*. The same procedure is followed with *all* markers consisting of voiced stops or of aspirated stops, obviously in order to avoid confusion from arising by final devoicing and deaspiration, as discussed above in section 2. The proposed *aḍḍ* would be the single exception to this generalization. Moreover, this single exception would occur in the worst possible case, namely in the one *Ḍ* suffix that ends in a consonant, where it is not just devoiced but completely deleted. It is as if Pāṇini here, in a dramatic reversal of his normal practice, went out of his way to *conceal* the marker by exposing it to the deletion rule (28)! He did this nowhere else — except in the equally suspect case of *G* that we discussed in the previous section.

The other reason for not ascribing this solution to Pāṇini is that several perfectly good treatments in his own authentic style would have been readily available to him. Even if the marker *Ḍ* for some reason had to be put at the end, it could have at least been protected by an epenthetic vowel, viz. *atUḌ*, just as was done with suffixes like *matUP* (4.2.86), *GHinUṆ* (3.2.141), and *ṆamUL* (3.4.22). But what he really would have done is to put the marker at the beginning of the morpheme, as he always does with voiced stops, viz. *Ḍat* instead of *atḌ*. The force of the marker would be the same, but putting it at the beginning would at one stroke get rid of the anomalies that beset the traditional reading.

These are good reasons to think that *aḍḍ* is a later reparsing. But here it is harder to accept the idea that the descriptive gap that the reparsing tries to address simply escaped his notice. After all, the problem arises in every derivation involving rule 7.1.25. I venture to suggest that Pāṇini actually had in mind a derivation of the nominative and accusative singular neuter forms such as (31), in which contraction is effected by rule (32) 6.1.107:

(31)	katara-am	katara-sU	
	katara-am	katara-am	7.1.24 **ato 'm** (*-sU* and *-am* → *-am* after neuter *a*-stems)
	katara-at	katara-at	7.1.25 **aḍ** ... (*-am* → *-at* after neuter *a*-stems)

katara-t katara-t 6.1.107 **ami pūrvaḥ** (see below)

Rule (32) 6.1.107 is a special case which supersedes the more general contraction rule (29) (which is itself a special case relative to the even more general vowel contraction rule 6.1.101).

(32) 6.1.107 **ami pūrvaḥ**
'*aK* (*a*, *i*, *u*, *ṛ*, *ḷ*) and a following vowel in the case ending *-am* are (together) replaced by the first vowel.'

Rule (32) applies in ordinary combinations like *vṛkṣa-am* → *vṛkṣam*. The principle that substitutes are treated like the original except with respect to their phonological properties (1.56 **sthānivad ādeśo 'nalvidhau**) dictates that the *-at* which replaces the suffix *-am* is also an instance of that suffix. This is pointed out by Kātyāyana in his vārttika 1 on 7.1.25, and is discussed in the *Kāśikā* as well.[11] On that understanding, rule (32) will also apply to the combination of *a* and *at* in *katara-at*, superseding (29) and yielding the correct Acc.Sg, *katarat* from *katara-am*.

In the derivation of Nom.Sg. *katarat* from *katara-sU*, both 7.1.24 and 7.1.25 are applicable to the input. If 7.1.24 takes effect first, it feeds 7.1.25 and the result is subject to 6.1.107. This is the derivation shown in *katara*, which I am suggesting was assumed by Pāṇini. If 7.1.25 were to take effect first, it renders 7.1.24 inapplicable, and this time the result is not subject to the special contraction rule 6.1.107, but to the more general contraction rule 6.1.102, so that the wrong form *katarāt* is derived, as explained above. The *utsarga-apavāda* principle, according to which special rules win over general rules, selects the former derivation over the latter derivation, so that the correct output is derived. It will do so provided it is given a global, "lookahead" interpretation, as proposed in Joshi and Kiparsky [MS] for Pāṇini's "traffic rules" in general, and extensively justified there for the *siddha*-principle in particular. On that interpretation, the derivation in (31) is chosen because in (31) the special rule 6.1.107 takes effect (and not the general rule 6.1.107, as in the alternative).

In the cited article we show that the lookahead *siddha*-principle

11 Joshi and Roodbergen have a different interpretation of rule 1.1.56, according to which it does not apply in this case (see [2003:56]). For present purposes what counts is that the tradition has accepted the applicability of 1.1.56 in this case.

was lost sight of by later grammarians. It appears that they also lost sight of the lookahead *utsarga-apavāda* principle. At that point, the derivation of Nom.Sg. *katarat* shown in (31) would have ceased to be available, and grammarians would have cast about for an alternative solution. Patañjali hit upon the notion of a deleted marker *Ḍ* in the substitute, and this idea won the day.

To summarize: construing the suffix replacement *at* as *atḌ* violates otherwise exceptionless practices of the grammar. If Pāṇini's intention had been to affix the marker *Ḍ* to *at* he could have done so in at least two better ways. Since he did not, we conclude that he did not intend for *at* to have *Ḍ*. A possible alternative derivation in the original system had the straightforward derivation of these forms given in (31), which relies on *sthānivadbhāva* and the "lookahead" character of Pāṇini's rule ordering principles. A reappraisal of these principles by post-Pāṇinian grammarians had the unintended effect of making this derivation impossible. The resulting problem was eventually addressed by reparsing *at* as *atḌ*.

5 Taddhitas with initial palatal and retroflex stops

The hundreds of *taddhita* suffixes introduced in Pāṇini's grammar include a handful that begin with *c-*, *j-* and *ṭ-*. For example, *-cuñcuP* and *-caṇaP* are added by (32) 5.2.26 to a nominal X to form a stem that means 'famous for X'. The grammarians illustrate it with the words *vidyācuñcu* and *vidyācana* 'famous for learning'.

(33) 5.2.26 **tena vittaś cuñcupcaṇapau**
'The suffixes *-cuñcuP* and *-caṇaP* are added in the meaning "famous for X"'.

Other such suffixes are *-cela*, *-cīra* (6.2.126-127), *-cara* (5.3.53), *jāhaC* (5.2.24), *jātīyaR* (5.3.69), and *-ṭīṭaC* (5.2.31).

Rule (9a) 1.3.3 **hal antyam** designates the final *-p* of *–cuñcuP* and *-caṇaP* as diacritic markers. The puzzle is that rule (10c) 1.3.7 **cuṭū** also designates the initial *c-* of these suffixes as markers. Such markers are deleted by 1.3.9 **tasya lopaḥ**. The question is how the initial *c-* and *ṭ-* of the abovementioned suffixes escape rule 1.3.7 and surface as real phonological consonants.

One traditional view is that rule 1.3.7 is *anitya* 'variable', i.e. that

it applies in some cases and not in others, and these suffixes happen to be the ones to which it does not apply. This would be an anomaly in the system. A Pāṇinian rule cannot simply be turned off when it does not work. It is optional only if it has an explicit qualifier such as *vā*, or falls under the scope of such a qualifier by *anuvṛtti*.[12]

An alternative traditional proposal is that the suffixes in question begin with a covert *y*-. This would be a real phoneme, not a marker (for none of the rules in (9) and (10) define initial *y* as a marker). Although it is a real phoneme, it is never heard, because rule (34) deletes *y* obligatorily whenever another consonant immediately follows.

(34) 6.1.66 **lopo vyor vali**
'*v* and *y* are deleted before *vaL* sounds (consonants other than *y*).'

According to this solution, the underlying forms of the endings are *ycuñcuP*, *ycanaP*, *yṭīṭaC*, and so on. The function of the extra initial consonant is to ensure that the overtly initial *c* and *ṭ* are not initial underlyingly (*upadeśe*). That being the case, 1.3.7 **cuṭū** does not define them as markers, and there is no question of deleting them by 1.3.9 **tasya lopaḥ**.

I think that the device of "protecting" the initial consonant of suffixes like *cuñcuP* with an invisible initial *y*- is non-Pāṇinian and that it arose through a post-Pāṇinian reparsing, perhaps by Patañjali. In support of this view, I will make the same three-point argument as in the previous two cases: (1) the posited *y* is at odds with Pāṇinian descriptive practice, (2) a different treatment in tune with the system would have been available, and (3) the descriptive problem is of the type that is easily overlooked. And I will draw a similar conclusion: at least the posited *y*, and most likely the suffixes themselves, are late additions to the grammar.

The first argument is familiar by now. Pāṇini takes great care to make his markers unambiguously distinct and recognizable, by choosing sounds which won't get mixed up with real phonemes and deploying them in positions where they are largely protected from sandhi processes. Why would he not have done so with these suffixes?

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12 See Kiparsky [1979] for an analysis of Pāṇini's treatment of optionality.

A new twist on the argument is that the *y-* is not only unnecessarily abstract but unnecessarily complex as well. Pāṇini always chooses the simplest available formulation, and among equally simple ones he chooses the most restrictive and derivationally most direct one (Kiparsky [1991]). If he had built a treatment of the *taddhita* suffix *-ṭīṭaC* into his grammar he would have simply made it *-Cṭīṭa*, where the marker *C* at the beginning of the suffix protects the following real consonant from being initial. If he had built a treatment of *taddhita* suffixes like *-cuñcuP* into his grammar he could have done so without complicating its underlying form or providing it with an extra initial consonant, by limiting the function of *C* as a marker to non-*taddhita* suffixes. He already has the rule to do that: (10d) 1.3.8 says that initial *l*, *ś*, and velars are markers *except in taddhita suffixes*. It could have been extended to initial *c* (e.g. (*__la-śa-ca-kv ataddhite__) without causing problems elsewhere. For, although the marker *C* is used in dozens of *taddhitas*, there is just one that actually begins with the marker *C*, the suffix *CphaÑ*, and it could have had its markers reversed to *ÑphaC* (or to *ÑIphaC*, with epenthetic *I* like *ÑIṭha*).[13] The fact that these solutions, or other available solutions like them, were not implemented indicates that the suffixes in question were retrofitted into the grammar after the system of markers, and specifically the function of *C*, had already been decided upon.

That the suffixes beginning with "real" palatal and retroflex consonants were incorporated at a later stage of revision is also made likely by two other considerations. First, morphologically and phonologically they look like second members of compounds, and would have been treated as such in the first round of analysis. The features that motivate a suffixal analysis of them are real, but very subtle, and would not have been apparent until most of the grammatical system was already completed.

The second reason is that, with one exception, they do not occur in early literature, and they are vanishingly rare in later texts also (Wackernagel-Debrunner [1954: 546-548]); they must have either belonged to some special register (colloquial?) or have been unproductive.[14] Rare words are obviously easier to overlook than

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13 Even more simply, instead of "covering" the initial *c-* with a deleted consonant, it could have been covered with an otherwise unemployed marker, such as a nasal vowel. (e.g. *IcuñcuP*).

14 One of these suffixes, *-ṭīṭa*, is introduced just for one word, *ava-ṭīṭa* 'hook-nose', a derivative of *ava* 'down', with an idiomatic meaning.

frequent ones. Only *-jātiyaR* 'kind of' is too productive to have gone unnoticed, but *-jātiya* is explicitly treated also as the second member of a compound by rule 5.4.9, in the meaning 'belonging to', and this could well have been the sole analysis initially, until the suffix was recognized as a distinct morphological element.

At this stage, the grammar would have had no suffixes beginning with palatals and retroflexes, a generalization that rule (10c) 1.3.7 exploits. The addition of the marginal *taddhita* suffixes that begin with palatals and retroflexes subverted this generalization, and created the problems that the grammarians solved by adding fake *y*-s to them. But why was the grammar not thoroughly revised to properly integrate the suffixes into the system when they did get added? Evidently because the markers *C* and *Ṭ* figure in hundreds of rules of the grammar and are thoroughly woven into its fabric; they are attached to major suffixes such as *-CaṄ*, *-CiṆ*, *-CvI*, *-Ṭā*, and *-ṬāP*, as well as many lesser ones. A proper integration of the newly added suffixes that begin with *c-* and *ṭ-* would have required at the very least changing the markers *C* and *Ṭ* to some other available sound, such as *J* or *ṬH*, at least in initial position. This would have had other repercussions throughout the system. Reworking the grammar this way would have been a technically complex task under any circumstances, of the sort that would have challenged even the author himself, let alone a later grammarian following in his footsteps.

6 Conclusion

Pāṇini scholars from Franz Kielhorn to S.D. Joshi have regarded the inaudible consonants traditionally attached to certain suffixes as interpretive artifices devised by later grammarians, but they have offered very little evidence. Cardona has challenged this view, but also without evidence. I have tried to spell out the reasons, as I understand them, why the inaudible consonants are not part of Pāṇini's grammar, and why they were added later by reparsing the text without overtly changing it. Some of these arguments are certainly implicit behind the prevailing scepticism towards these elements, others may be new. I reviewed the relevant descriptive conventions of Pāṇini's grammar relating to the marker system, and showed how the inaudible consonants violate all of them, how Pāṇini could have dealt with the data in question in his own style, and how

the need for revisions by later grammarians might have arisen. This closer look at the marker system has given me a new appreciation of the care that Pāṇini devoted to making his grammar not only maximally simple, but perspicuous and unambiguous, and free of devious tricks. To paraphrase Einstein's famous remark about God: Pāṇini is slick, but he isn't mean.[15]

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15 My adaptation follows Einstein's own English version of the original German "Raffiniert ist der Herrgott, aber boshaft ist er nicht."

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