Studies in the Linguistic Sciences
Volume 23, Number 2, Fall 1993 [publ. October 1996]

SUBVERSION OR CONVERGENCE? THE ISSUE OF PRE-VEDIC RETROFLEXION REEXAMINED*

Hans Henrich Hock

एतद्धस्तिदर्शन इव जात्यन्धाः (Śaṅkarācārya's bhāsya on Chāndogya-Upaniṣad 5.18.1)

As is well known, members of at least six distinct language families in South Asia have come to converge to a remarkable degree in their overall structure through millennia of bi- and multilingual contact. Most of the convergence has been in the syntax, but one phonological phenomenon, a contrast between dental and retroflex consonants (as in Skt. *dī-* 'shine' : *ḍī-* 'fly'), has the distinction of having been noticed earliest (Pott 1833, 1836). It is this phenomenon which I address in this paper.

Some scholars (most recently Thomason & Kaufman 1988, Kuiper 1991; see also and especially Emeneau 1980) argue that the source of retroflexion is Dravidian, for the dental : retroflex contrast can be reconstructed for Proto-Dravidian, while the ancestors of the other languages are said to have lacked it. Since the contrast is found in the earliest attested stage of Indo-Aryan, Vedic Sanskrit, convergence between Indo-Aryan and Dravidian must therefore have begun in the second millennium B.C., in terms of a SUBVERSION (my term) of Indo-Aryan by Dravidian.

In earlier publications (e.g. Hock 1975, 1984) I claimed that the arguments for early convergence are not cogent, since the Sanskrit dental : retroflex contrast can be explained by internal Indo-Aryan developments. Moreover, the contrast appears to be an innovation not only in Indo-Aryan, but also in Dravidian. This raises the possibility that the feature is a JOINT innovation of Dravidian and Indo-Aryan, reflecting direct or indirect bilingual contact.

At the same time, early Dravidian has a TRIPLE contrast, dental : alveolar : retroflex (or post-dental). This difference may be taken to cast doubt on the convergence hypothesis.

In this paper I present a somewhat speculative hypothesis that a triple dental : alveolar : retroflex contrast must be postulated for early stages of both Indo-Aryan (and Iranian) and Dravidian and further, that this contrast resulted from joint, convergent innovations. I support the hypothesis with comparative Indo-Iranian evidence and the dialectological evidence of early Middle Indo-Aryan (especially the Aśokan inscriptions). The latter evidence is especially interesting, since the development of the hypothetical Indo-Aryan alveolars to dentals in the more western regions and to retroflexes in the more eastern regions of Indo-Aryan is closely mirrored by corresponding

developments of the well-established alveolars to dentals in more western Dravidian and retroflexes in more eastern Dravidian. Alternative explanations of the observed data either are unnecessarily complex or are lacking in explanation.

The finding that the developments are the result of convergence, not of subversion, is significant, for it suggests that the social relationship between Indo-Aryan and Dravidian speakers in early India was not substantially different from what it is today—a relationship of (near-)equality, rather that the traditional picture of marauding Indo-Aryan invaders suppressing an indigenous Dravidian population and forcing it to learn their language.

1. Introduction

South Asia is a paradigm example of a multicultural, multiethnic, multilingual area. Members of at least six distinct language families coexist: Indo-Aryan, East Iranian, Munda, Austro-Asiatic, Dravidian, Tibeto-Burman, plus an "unaffiliated" language in the extreme north, Burushaski.[1] (For a simplified view of where these languages are spoken today see Map I, next page.) While only Indo-Aryan and Iranian are closely related, and Munda is remotely related to Austro-Asiatic, millennia of bi- and multilingual contact have led to a remarkable degree of structural convergence between these different language families and their members. As a consequence, South Asia has also come to be known as a paradigm case of a CONVERGENCE AREA. (For a good synchronic discussion see Masica 1976.)

Four features are commonly listed as characteristic of this area:

I. An unmarked major constituent order SOV, i.e. subject (S) before object (O) before verb (V), as in example (1);
II. A tendency to use non-finite absolutives, where modern European languages might use dependent clauses with finite verbs (2);
III. The marking of cited discourse by postposed quotative markers and a general absence of indirect discourse (3);
IV. "Retroflexion", i.e. a phonological contrast between dental and retroflex consonants (4).

(1) Hindi maiṁ (S) kitāb (O) paṛh rahā hūṁ (V) 'I am reading a book.'

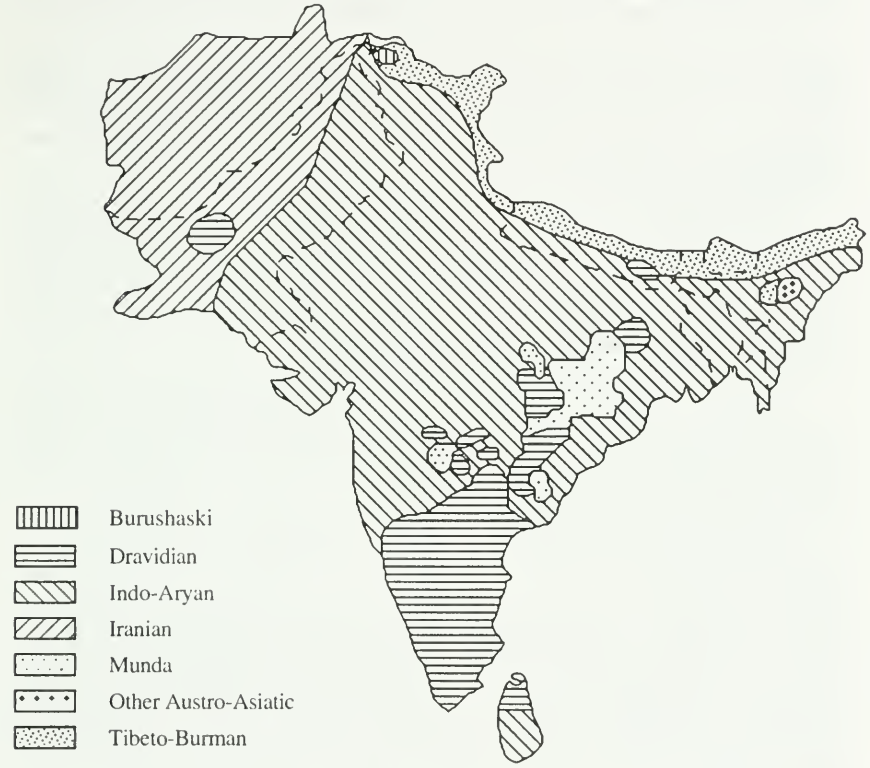
(2) Sanskrit tatra **gatvā** (abs.) na mucyase 'When you have gone there, you do not get free.'

(3) Sanskrit nakir vaktā 'na dād' **iti** (quot.) 'Nobody will say, "He shall not give."'

(4) Sanskrit pāta- 'flight' : pāṭa- 'portion'

As is common in convergence areas,[2] these features do not cover the entire region: Kashmiri places finite verbs in second position in main clauses and certain dependent clauses. SVO features are found in many Munda/Austro-Asiatic languages. Hindi-Urdu, Kashmiri, and many other Indo-Aryan languages, but

also Dravidian Brahui mark direct discourse by preposed *ki*, not by postposed quotative markers. Assamese and much of Tibeto-Burman lack retroflexion.



Map I: Distribution of modern South Asian languages (simplified)

The presence of all of the features in Sanskrit, the oldest attested stage of Indo-Aryan, suggests that the absence of some of these in some of modern Indo-Aryan results from secondary developments. On the origin of the Kashmiri verb-second position see Hock 1982a. The use of *ki* as a marker of direct discourse is no doubt due to Persian influence (see Hock 1982b, which needs to be updated; see also Marlow Forthcoming). The absence of the retroflexion in Assamese probably reflects contact with Tibeto-Burman.[3]

The question of when the linguistic convergence of the South Asian languages began and which group is responsible for it is highly interesting for anyone concerned with the early linguistic and ethnic history of South Asia. Attempts to answer the question, however, have led to some controversy.

Many scholars (most recently Thomason & Kaufman 1988, Kuiper 1991; see also and especially Emeneau 1980) argue that the source is Dravidian, since all of the four features can be reconstructed for Proto-Dravidian, while the ancestors of

the other languages are said to have lacked them. Since the features are found in the earliest attested stage of Indo-Aryan, Vedic Sanskrit, Indo-Aryan must according to this view have acquired them prior to that stage, in the second millenium B.C.

The sociolinguistic setting for subversion is usually considered one of inequality: The Indo-Aryan conquest forced the indigenous Dravidians to learn Sanskrit, the language of the Indo-Aryans; and as English has been influenced by the modern South Asian languages, the structure of Sanskrit was altered by transfer of Dravidian features.

The term used in traditional historical linguistics for such a development is "substratum influence". Using the terminology of Thomason & Kaufman 1988, the process can be characterized as "shift" of speakers from one language (usually of lower power or prestige) to another one (of higher power or prestige). For brevity's sake let me use the more compact term SUBVERSION to refer to "substratum influence" or the effects of "language shift".

Following the lead of others, I have claimed (e.g. Hock 1975 and 1984) that the arguments for prehistoric subversion are not cogent: The syntactic features (I - III) are either inherited from Proto-Indo-European or Proto-Indo-Iranian, or are typologically natural in early Indo-European; and the feature of retroflexion can be explained by internal Indo-Aryan developments.

Several recent reinvestigations of early Dravidian and Indo-Aryan/Indo-European syntax support the claim that the syntactic features, in their broad outlines (and including at least one other feature, the use of relative-correlative structures), were shared by the prehistoric ancestors of Dravidian and Indo-Aryan, going back to periods much earlier than the Indo-Aryan migration to South Asia. (See Steever 1988, Hock 1988b, 1992a, as well as Hock 1996).[4] For these reasons, and to keep the present paper within manageable limits, I concentrate on retroflexion, bringing in other evidence only where relevant to the argument.

In contrast to most earlier subversionist claims, but also breaking with my own earlier counterclaims, I present a speculative argument that retroflexion can be explained as resulting from CONVERGENCE, a process different from subversion, both in its effects and in its social setting. While subversion consists of the unidirectional transfer of features from one language to another, under conditions of strong inequality and sudden shift, convergence is a more complex, mutual or bidirectional development through which languages in long-standing bilingual contact come to be more similar in their overall structure. The required extended bilingualism is best maintained in a situation of approximate social equality; but it can also arise under other conditions, such as a "social imperative" of maintaining ethnic, religious, etc. identity by preserving linguistic distinctiveness.[5]

I argue that prehistoric convergence took place under social conditions that fostered extended bilingualism, similar to what we find in modern South Asia; that it involved Dravidian, Indo-Aryan and East Iranian, and possibly other languages as well; and that it led to a triple contrast (at least in Indo-Aryan and Dravidian) of dental : alveolar : retroflex, not just the simple dental : retroflex contrast ordinarily postulated for Indo-Aryan.

2. A survey of earlier views on Indo-Aryan retroflexion

Early scholars such as Pott 1833, 1836 and Caldwell 1855 could simply assert that Indo-Aryan (Sanskrit) retroflexion results from Dravidian subversion. But as time progressed it became necessary to go beyond such sweeping statements and to state more precisely HOW subversion exerted itself.

What was especially troubling is that in its general outlines early Indo-Aryan retroflexion could be explained by purely internal developments, with parallels in other languages (see e.g. Konow 1906, Bloch 1925). Compare the schematization in (5), and see also §5.1 below. Similar developments can be found in other Indo-European languages, most notably in Swedish and Norwegian dialects. Ever since Bühler 1864, anti-subversionists have taken these facts as evidence that we do not need to invoke Dravidian subversion to explain Indo-Aryan retroflexion. Something like a compromise position was offered by Konow 1906 and Bloch 1929 who claimed that Dravidian influence may have accelerated or aided in the propagation of these developments.

(5)

	I	II	III	IV	V
a.	(*liǵh-to- >)	*liẑdha- >	*liẓdha- >	*liẓdha- >	līḍha- 'licked'
cf.	(*wiǩ-to- >)	*wišta- >	*viṣṭa- >	viṣṭa- =	viṣṭa- 'entered'
b.	(*wiǩ-s >)	*wiš̌ >	*wiṣṣ >	*wiṭs >	viṭ 'people, clan' (N sg.)
cf.	(*wiǩ-su >)	*wiš̌šu >	*wiṣṣu >	*wiṭsu >	vikṣu (id.) (L pl.)
					(→ post-RV viṭ-su)

Emeneau 1956 and Kuiper 1967a introduced a much stronger and more specific claim: The presence of retroflexion in Dravidian led to the "redistribution" of pre-Indo-Aryan allophones as retroflex phonemes. Kuiper identified these allophones as Indo-Iranian *š̌ and *ž̌, elements generally recognized as the "triggers" for Indo-Aryan retroflexion, as in the above formulation.[6] This is now the standard subversionist position and has been accepted in Thomason & Kaufman 1988, the major general monograph on linguistic contact.

Subversionists moreover believe that it is highly unlikely that Indo-Aryan retroflexion arose independently from that of Dravidian, on the same South Asian subcontinent. And they consider irrelevant the fact that other Indo-European languages have developed retroflexion, since Indo-Aryan is the only EARLY branch of Indo-European with this feature (see e.g. Tikkanen 1987: 284).

Antisubversionists are not convinced of the logic of this argument: While it is true that Indo-Aryan retroflexion developed much earlier than retroflexion in other Indo-European languages, this does not mean that it must result from subversion. Different languages may exhibit similar phonological changes at different rates and at different stages. (Gothic, for instance, virtually leveled out the effects of Verner's Law many centuries before the other Germanic languages; but this does not mean that Gothic leveling resulted from subversion.) The fact that other Indo-European languages were able to acquire the feature demonstrates that retroflexion is not such an unusual phonological phenomenon that it must per-

force be attributed to outside subversion—pace Tikkanen 1987:284 or the extreme view of Bhat 1973.

At least some antisubversionists would however admit that the issue of whether it is LIKELY that Indo-Aryan retroflexion arose independently from Dravidian is a more serious one. Unfortunately, it is impossible to determine the likelihood of two similar phenomena arising independently in languages that come to share the same geographic area. As observed by Lyle Campbell (p.c. 1993), such an event is not impossible, as shown by the case of Brazil: Portuguese has come in contact with indigenous languages which, like Portuguese, have a contrast between oral and nasal vowels; but we know that the contrast existed before contact, in both groups of languages. Now, the Brazilian case merely establishes the possibility of chance similarity; it tells us nothing about its statistical likelihood. Nevertheless it further supports anti-subversionist reservations about the need to attribute Indo-Aryan retroflexion to Dravidian subversion.

More concrete arguments against Dravidian subversion are based on structural evidence.[7] Following Bloch 1925, Hock 1975 and 1984 observes a number of differences between early Dravidian and Indo-Aryan: Dravidian has a triple contrast (dental : alveolar : retroflex), while Indo-Aryan is considered to have a simple contrast between dental and retroflex (plus post-dental, alveolar *r*). Dravidian permits final retroflex and alveolar sonorants, early Indo-Aryan does not, except for the onomatopoetic nonce-form *bhāṇ* and coined terms of indigenous grammar. (Sanskrit word-final *r* is realized as *ḥ* utterance-finally.) From the earliest times, Indo-Aryan has at least one initial retroflex consonant (in Skt. *ṣaṭ* '6' and derivatives); Dravidian initial retroflex consonants are a late innovation. Indo-Aryan has retroflex sibilants which are absent in Dravidian, while the latter has a retroflex approximant *ɾ̤* which is absent in Indo-Aryan.[8] These extensive differences, summarized in Tables I and II, are considered difficult to explain if Indo-Aryan retroflexion resulted from Dravidian subversion.

The Brazilian parallel is interesting in this regard: The phonological effects of the oral : nasal vowel contrast, which we know to be of independent origin, differ considerably: In the indigenous languages, nasal consonants tend to become pre- or post-"oralized" next to oral vowels, a phenomenon without counterpart in Portuguese.

	SANSKRIT			DRAVIDIAN		
	DENT.	ALV.	RETR.	DENT.	ALV.	RETR.
STOP	t		ṭ	t	t̲	ṭ
	th		ṭh			
	d		ḍ			
	dh		ḍh			
SIB.	s		ṣ			
NAS.	n		ṇ	n	n̲	ṇ
LIQU.	l	r̲			l̲	l̤
					r̲	ɾ̤

Table I: Differences between the early Sanskrit and Dravidian systems

	SANSKRIT	DRAVIDIAN
Final retr./alv. sonor.	-	+
Initial retr./alv.	+	-
Idiosyncratic *ṣ*	+	-
Idiosyncratic *ṟ*	-	+

Table II: Other differences between early Sanskrit and Dravidian

Note further that many of the early phonological differences between Indo-Aryan and Dravidian disappear toward the modern period (except in the extreme south and northwest), as shown by Ramanujan & Masica's 1969 areal study of modern South Asian phonology. As argued in Hock 1984, in contrast to the prehistoric situation, this development does provide robust evidence for structural interaction. But it took place at a considerably later time and it involved convergence, not subversion.

In Hock 1975 I suggested that the dental : retroflex contrast may be an innovation, not only in Indo-Aryan, but also in Dravidian. My claim was based on speculative, and in one case clearly premature, attempts to genetically link Dravidian with outside languages which do not have the contrast (Uralic and Elamite). In a publication not accessible to me at the time, Zvelebil 1970 proposed a 'highly speculative' hypothesis that Dravidian consonant clusters and geminates result from large-scale assimilatory processes, some of which turned sequences of retroflex—or alveolar—sonorant plus dental stop into retroflex or alveolar stops.

Drawing on Zvelebil 1970 and on my 1975 suggestion, Tikkanen 1987 claims that retroflexion is innovated both in Dravidian and in Indo-Aryan. He attributes the impetus for the innovations to two separate substrata (295) and claims that convergent developments between Indo-Aryan and Dravidian took place later. On the Indo-Aryan side, he believes that the source for subversion was an unknown northwestern substratum, which in his view is also responsible for the large amount of early Indo-Aryan lexical items that can be traced neither to Proto-Indo-European nor to any of the known non-Indo-Aryan languages of South Asia. As for Dravidian, he entertains the idea that subversion is attributable to 'some lost sub- or adstratum in the pre-Indo-Aryan period' (323).

Given what we know—or do not know—about the distribution of languages in prehistoric South Asia, Tikkanen's proposal cannot be rejected out of hand. In fact, the modern presence of the language isolate Burushaski in the northwest may be taken as evidence for a prehistoric presence of a non-Indo-Aryan/non-Dravidian language in the area. (But see below on the difficulties in trying to draw prehistoric inferences from the modern situation.) Unfortunately, the hypothesis of an unknown substratum (or of several such substrata) is methodologically dubious, since by definition it is not open to verification or falsification.

Tikkanen is now doing intensive research on the northwestern languages of South Asia.[9] It is to be hoped that this research will eventually make it possible to identify a likely substratum; but the enormous time difference between the Indo-

Aryan arrival in South Asia and the first attestation of the northwestern languages places formidable obstacles in the way.

Moreover, the question must remain as to what the relation was, if any, between the two separate substrata that gave rise to Indo-Aryan and Dravidian retroflexion. Is it likely that the two substrata had developed retroflexion independently? Methodologically, invoking two separate substrata is problematic in that it merely projects the issue of Dravidian/Indo-Aryan prehistoric relationship to an even more remote—and uncertain—period in prehistory.

An alternative, and at this stage of our knowledge more feasible, hypothesis is that Indo-Aryan (as well as East Iranian) and Dravidian retroflexion and alveolarization are not just parallel innovations due to subversion by different unknown substrata, but that they result from CONVERGENT changes. It is this hypothesis which I want to support in the present paper, leaving open the question whether convergence took place under direct contact or whether it may have been mediated by other, intervening languages.

Before doing so let me briefly discuss some of the subsidiary arguments that have been raised in support of the view that Indo-Aryan retroflexion resulted from prehistoric Dravidian subversion. An examination of these arguments demonstrates the great difficulties facing anyone trying to make inferences about the prehistoric linguistic scene in the northwest (or any other part of South Asia) and the fact that any hypothesis about prehistoric contacts in this area—and their linguistic consequences—must by definition be speculative. At the same time, reexamination of one of the arguments establishes a possible building block for a new hypothesis.

3. Subsidiary arguments for prehistoric subversion

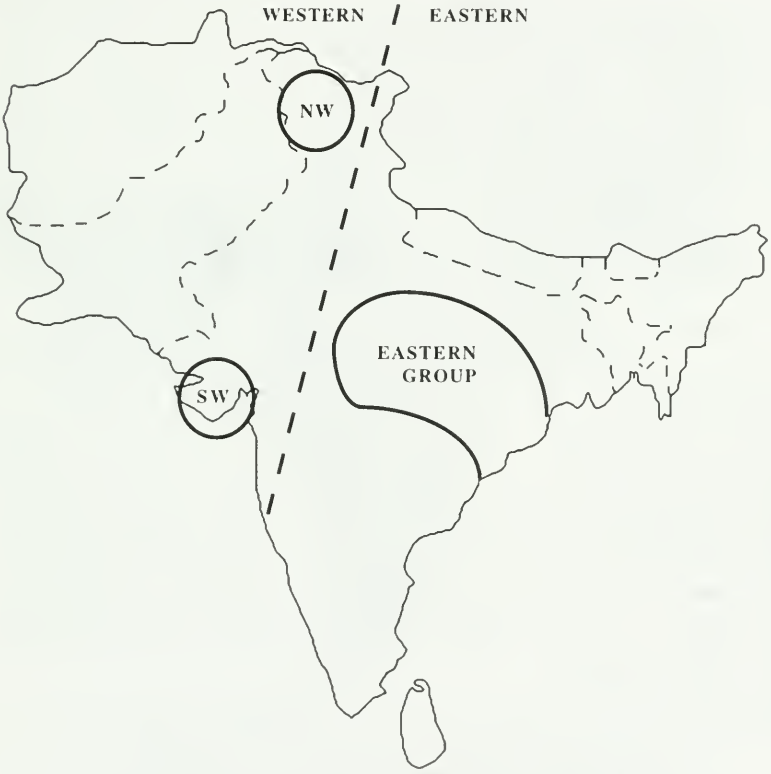
The greatest difficulty in dealing with the linguistic prehistory and early history of South Asia is the fact that we have more or less contemporary evidence from only one language family, Indo-Aryan; and even for this family the evidence is limited, because the early texts are composed in a language, (Vedic) Sanskrit, which is quite conservative and puristic. For other languages, we have to depend on evidence from much later periods. This is especially true for the non-Indo-Aryan languages spoken in present-day northwestern South Asia which are not attested before the nineteenth century.

The problems caused by this situation can be illustrated by examination of two arguments frequently raised in favor of prehistoric Dravidian subversion of Indo-Aryan.

One argument is based on the presence of a Dravidian language, Brahui, in Baluchistan. The geographical isolation of Brahui is taken to establish that it is a relic language, especially since migration is believed to normally take place only from north(west) to south. These facts are considered to legitimize the assumption of a Dravidian presence in the prehistoric northwest of first Indo-Aryan settlement. Further support is found in the fact that two other Dravidian languages, Kurukh and Malto, which with Brahui form the North Dravidian subfamily, are

spoken fairly to the north (in eastern Central India), suggesting that Brahui was part of a Dravidian subfamily which extended over a vast portion of northern South Asia.

A second argument, cited by Thomason & Kaufman 1988, rests on Southworth's 1974 attempt to establish a major east-west division of Indo-Aryan languages for the time of the Aśokan inscriptions (see Map II) and to link this division to more recent evidence that in his view suggests greater Dravidian influence in the west, i.e. in a region closer to the area of first Indo-Aryan settlement.

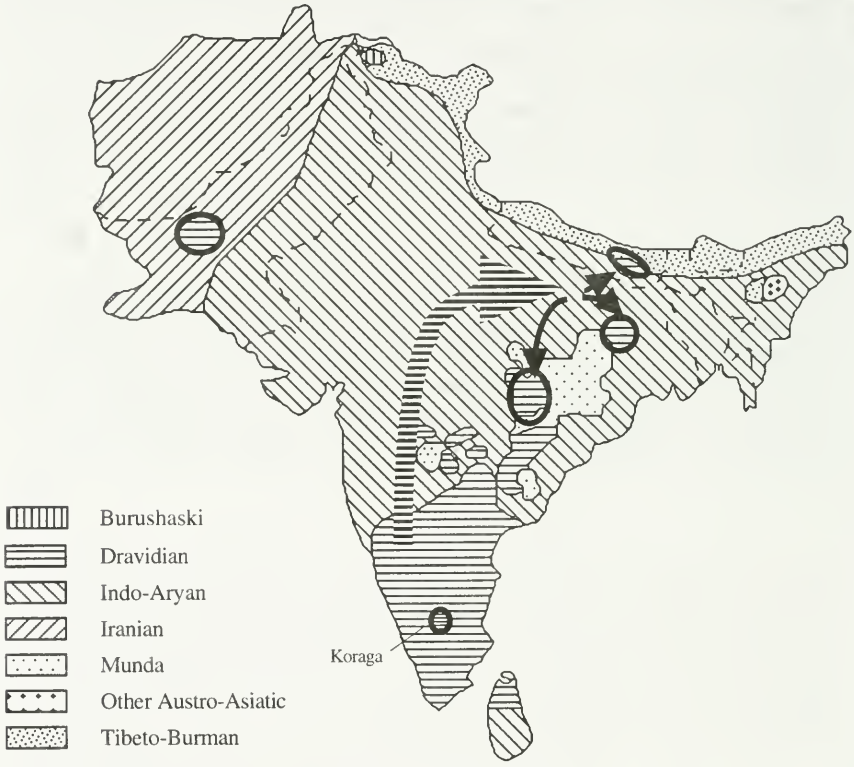


Map II: Dialect divisions of the Aśokan inscriptions according to Southworth 1974 (with reference to Bloch 1950)

Now, some 3,000 years separate the arrival of the Indo-Aryans from the time that North Dravidian languages begin to be attested. This fact in itself should give us pause. But there are more specific reasons for caution.

According to their own traditions, the Kurukh (and Malto) people migrated to their present locations from Karnataka, via the Narmada valley (Grierson 1903-1928, v. 4; Hahn 1911); see Map III. Several linguistic facts support this tradition: Bloch 1946 points out that the place names in present-day Kurukh and

Malto territory are Munda, not Dravidian, in origin. Kuiper 1966 demonstrates linguistic influence of Kurukh on Nahali and Kurku, a fact which supports the Kurukh tradition of an earlier settlement in the Narmada valley. Bhat 1971 produces linguistic evidence that Koraga in South Karnataka (see Map III) is more closely related to the North Dravidian languages than to the rest of Dravidian. In short, we have cumulative evidence that connects North Dravidian Kurukh and Malto to the south, not to the extreme northwest of Brahui.



Map III: Northern Dravidian languages and migrations

In fact, Bloch (1911, see also 1925, 1929) has suggested that Brahui, too, may have a southern origin, since according to their own traditions, the Brahuis have migrated to the area in which they live now.[10]

Such a northward migration would in fact not be unusual. As is well known, several Indo-Aryan groups likewise have followed this route, or migrated even farther. These include Gandhari or Niya Prakrit in early medieval Khotan and farther east; modern Dumaki in northwestern South Asia; the Parya who came to modern Uzbekistan via Afghanistan (Comrie 1981); and the 'Gypsies' or Ḍom who, via Central Asia, have spread all over Eurasia.

The present-day linguistic distribution, some 3000 years "after the fact" thus cannot be taken as cogent evidence for a prehistoric Dravidian presence in the northwest.

In all fairness, however, it must be admitted that the possible southern origin of modern North Dravidian does not preclude a Dravidian presence in the prehistoric northwest. We know that the just mentioned transplanted Indo-Aryan languages "remigrated" northward from areas well to the south. Thus, Comrie 1981 with references shows that the language of the Parya is closely affiliated to Hindi/Panjabi, and Kuiper 1966 adduces evidence for Kurukh influence on Ḍom in the Narmada valley. At the same time, we also know that the Indo-Aryan languages originally moved into South Asia from the northwest. Given the Indo-Aryan precedents for southward migration and subsequent remigration to the north, it is possible that there were Dravidians in the northwest when the Indo-Aryans came to South Asia, that these Dravidians moved southward under Indo-Aryan pressure (or that their languages died out), and that the present-day location of Brahui results from remigration to the north. But it is just as possible that the Dravidians, if they originally came from the north, had already departed from the northwest to the south by the time of Indo-Aryan arrival, and that only later did Brahui and the other Dravidian languages move north again.

The problem is, we simply do not have any reliable independent evidence that would permit a choice between these different possibilities.

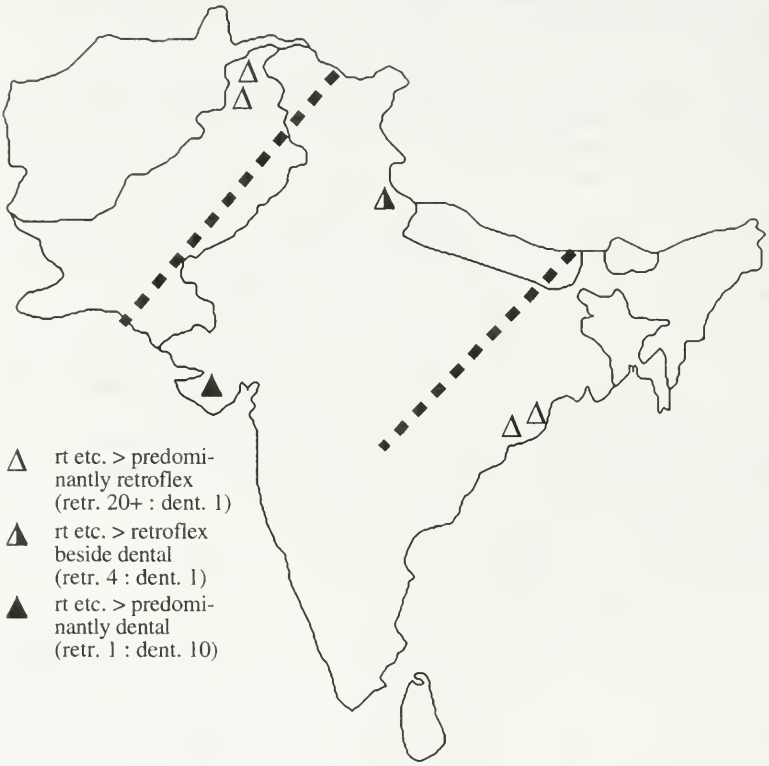
From the chronological perspective, Southworth's dialectological division of the Aśokan inscriptions rests on firmer grounds, since only a little more than a thousand years separate Aśoka from the time of Indo-Aryan arrival in South Asia. But his dual division is not supported by Bloch 1950, to whom he refers, who instead suggests a triple division: Center and East vs. [South]West vs. Northwest. A recent reexamination of the treatment of (syllabic and nonsyllabic) *r* + dental stop in the Aśokan inscriptions suggests a different division (superseding Hock 1991). If we exclude developments limited to specific lexical items which may be suspected of being borrowings, we can distinguish four different areas (see Map IV[11]):

a. A northwestern area with almost exclusively retroflex outcomes (beside cluster representations: Shahbazgarhi mainly *tr* etc., Mansehra *tr* etc.);
b. Southwestern Girnar with predominant dental;
c. North-central Kalsi with a retroflex : dental ratio of about 4 : 1;
d. An eastern area (Dhauli and Jaugada) with almost exclusive retroflex.

However, given the proximity of Kalsi to the east, its relatively high retroflex ratio may be attributed to eastern influence.[12] Under this assumption, it is possible to resolve Aśokan dialectology into three areas:

a. The northwest (predominant retroflex beside cluster representations);
b. A central area that originally includes Girnar and Kalsi (predominant dental);
c. The extreme east (predominant retroflex).

See Map IV (next page).



Map IV: Development of *r* + dental stop in the Aśokan inscriptions

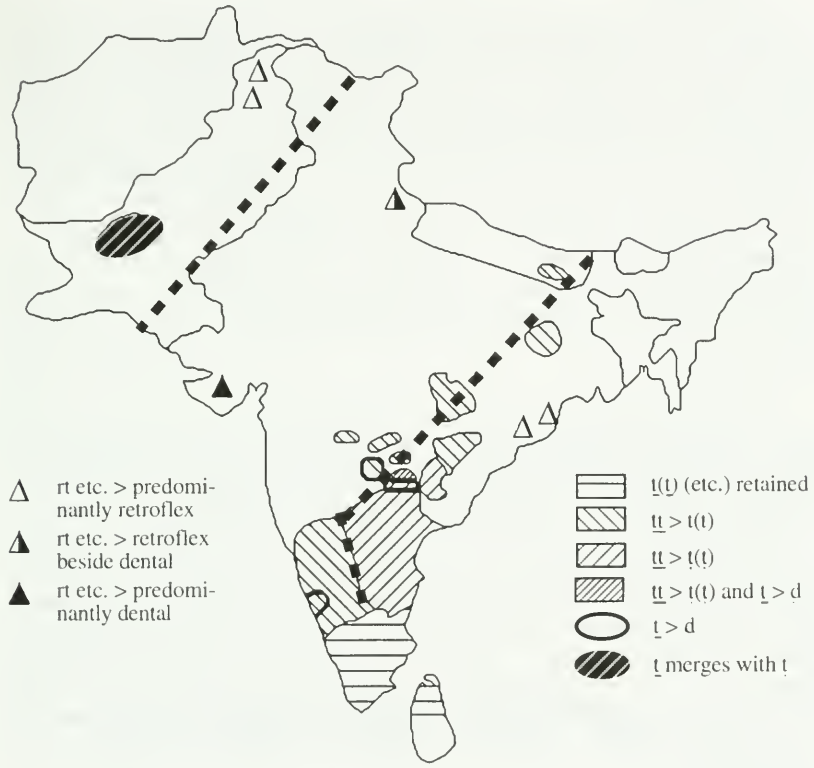
Significantly, this distribution agrees well with the Modern Indo-Aryan outcomes of *r* + dental stop discussed by Turner 1926 with 1921, 1924, a fact which suggests that the Aśokan inscriptions, at least on this count, offer a reliable window on developments in archaic Middle Indo-Aryan.[13]

By contrast, the evidence of the Aśokan inscriptions does not support Southworth's east-west division of Indo-Aryan and the concomitant claim that western Indo-Aryan exhibits stronger influence from Dravidian—whatever may be the merits of his findings for modern South Asia.[14]

Interestingly however—and surprisingly—the triple north-south division of Indo-Aryan as regards dental vs. retroflex outcomes of *r* + dental stop lines up amazingly well with a Dravidian areal division between languages in which alveolar stops have turned into dental vs. retroflex[15] (making allowances for some distributional irregularity in the transition area between dental and retroflex outcomes). See Map V (next page).[16]

To lay the foundation for an account that explains this parallelism as the result of convergent phonological developments, it is useful to briefly reexamine the

available evidence regarding the prehistoric and early historic social relationship between Indo-Aryans and non-Indo-Aryans.



Map V: Development of *r* + dental stop in the Aśokan inscriptions and Modern Indo-Aryan (according to Turner) compared with the Dravidian development of alveolar stops (mainly geminates).

4. The social relationship

Explicit, or at least implicit, in the subversionist view of early Indo-Aryan/Dravidian contact is the assumption of unilateral influence of Dravidian on Indo-Aryan. (No mention is ever made of prehistoric Indo-Aryan influence on Dravidian.) Such a unilateral development requires the assumption that the prehistoric social relationship between Indo-Aryans and Dravidians was one of considerable inequality. Dravidian speakers therefore would have had to speak Indo-Aryan and, just as happened to English in modern South Asia, in shifting to Indo-Aryan they transferred structural features of their own language(s). This interpretation of Indo-Aryan/Dravidian interaction is aptly summarized by Emeneau 1956: note 4:

> ... it was to their [the Indo-Aryans'] advantage, political, economic, religious, to have subjects and proselytes. Absorption, not displacement

is the chief mechanism in radical language changes of the kind we are considering.

This view is often considered supported by the belief that the Rig-Vedic Indo-Aryans made a strong ethnic distinction between themselves and the indigenous population, the *dāsas* or *dasyus*, frequently depicting the latter as 'infidels' (*adeva*), and characterizing them as 'black-skinned' in contrast to their own lighter hue. While not all subversionists accept this view (Emeneau, for instance, does not), it pervades much of the literature on the linguistic and general prehistory and early history of South Asia, as can be gauged from the following incomplete list of references: Zimmer 1879 (apparently the first propagator of the view); Macdonnell & Keith 1912: s.vv. dāsa and várṇa; Chatterji 1960:7 and 32; Elizarenkova 1995:36; Gonda 1975:129; Hale 1986:147 (see also 154); Kuiper 1991:17 (vs. ibid. 3-4); Kulke & Rothermund 1986:35; Mansion 1931:6; Rau 1957:16; Parpola 1988:104-106, 120-121, 125; see also Deshpande 1979:260, 1993:216-127.

Examination of the textual evidence of the Rig-Veda and general considerations regarding the early interaction of different ethnic groups suggest that, like several other aspects of early South Asian society,[17] this picture of radical inequality needs to be redrawn. (For a fuller discussion see Hock 1996.)

The Rig-Vedic passages in which adjectives meaning 'black' or 'dark' are used in reference to human enemies are of two kinds. One refers to the forts of the enemies, especially their 'womb', a term which may simply refer to their dark interior. The other passages seem to use the adjective in an ideological/metaphorical sense, contrasting the 'dark' world of the *dāsas* and *dasyus* with the 'light' world of the *āryas*. As far as I can tell, there is no unambiguous evidence for an awareness of color-related "racial" differences in the Rig-Veda. In fact, the notion "race" is a problematic invention of the colonial period, quite inappropriate, I believe, in the ancient world.

It is, I think, similarly inappropriate to project the supremacist ideology of modern colonial powers like the British into ancient and prehistoric times. True, those defeated in war often suffered a cruel fate, even extinction. At the same time, both "civilized" empires (such as the Roman one) and "barbarian" ones (such as the Huns) were multiethnic, multilingual, and multicultural. War-time alliances kept shifting and could pit members of the same ethnic group against each other (such as Germanic tribes allied with the Huns, and with the Romans). In fact, according to Classical Sanskrit political theory, alliances were to be made with people living on the other side of one's enemy, who would often be ethnically closer to the enemy's party than one's own.

Most important, the Rig-Vedic evidence suggests a fluid situation of this type, in which ethnicity played a relatively minor role. A dāsa, Balbūtha Tarukṣa, is mentioned as patron of a Vedic seer. Numerous passages refer in one breath to dāsa and ārya enemies and in one of these, both types of enemies are referred to as *ádeva* 'godless, infidel'. Especially instructive is the famous "Battle of the Ten Kings" (RV 7:18 with 7:33, 7:83; cf. also Kuiper 1991): On both sides of the bat-

tle we find people with "Aryan" names (such as Vasiṣṭha vs. Bharata) AND with names that sound "non-Aryan" (such as the Sṛñjayas vs. Śimyu).

The picture that emerges is rather different from the one commonly drawn: While there was hostility and warfare between Indo-Aryans and their dāsa/dasyu opponents, there was no social chasm comparable to that between the British colonialists and the South Asian people(s) they subjugated. Whatever the ethnic and linguistic differences, they did not prevent āryas and dāsas/dasyus from making shifting alliances with each other, requiring them to interact bi- or multilingually on a continuing basis.

If, then, there was indeed some kind of (direct or indirect) contact between Indo-Aryans and Dravidians, the linguistic consequence should be expected to have been bidirectional convergence, rather than the unidirectional subversion commonly assumed. This is the hypothesis which I will try to support in the remainder of this paper as regards the origin of Indo-Aryan and Dravidian retroflexion and alveolarization.

5. Retroflexion and alveolarization as convergent developments

As observed in §3, Indo-Aryan clusters of *r* + dental stop underwent a dual development in the Aśokan inscriptions and in later Indo-Aryan, either to dental or to retroflex stop. (Rig-)Vedic evidence shows that this development goes back to Old Indo-Aryan times: As is well known, although the Rig-Veda, and Sanskrit in general, ordinarily retain *r* + dental stop, we find occasional Rig-Vedic forms of the type (6), usually explained as borrowings from a contemporary "Vedic Prakrit".[18] Note especially (6b) vs. (6c) with retroflex vs. dental outcomes of the same element, *kṛta-*.

(6) a. RV kartá 'cavity, hole' > RV kāṭá 'cavity, depth'
b. RV vikṛta 'changed: misshapen' > RV vikaṭa 'hideous, terrible'
c. *kṛta-vat 'having the lucky throw in gambling' > RV kitava 'gambler'

In the remainder of this section I want to advance the hypothesis that these dual outcomes of *r* + dental stop, which we find from Old Indo-Aryan, through the time of Aśoka, to the present day, go back to an intermediate earlier stage with alveolar stops, and that the prehistoric developments giving rise to these alveolar stops, as well as to retroflex stops, were convergent with similar changes in Proto-Dravidian.

In support of this hypothesis, recall that the geographical distribution of dental vs. retroflex outcomes of *r* + dental in the Aśokan inscriptions is remarkably similar to the distribution of dental vs. retroflex outcomes of (geminate) alveolar stop in Dravidian (except in the extreme south which tends to retain the alveolars); see Map V above.

If we assume that *r* + dental changed directly into dental or retroflex in Indo-Aryan, this similarity in distribution would be accidental; but if we hypothesize that the development took place via an intermediate alveolar, then we can explain the similarity as resulting from convergent changes that eliminated alveolar stops in both Indo-Aryan and Dravidian (except in the deep south), in favor of either

dental or retroflex, depending on geographical region, along north-to-south lines.[19] (The fact that "rich" systems with a triple contrast dental : alveolar : retroflex may be relieved by merger of the alveolar with either dental or retroflex is demonstrated by most of Dravidian. Similar developments have taken place in dialectal Norwegian and Swedish; cf. Steblin-Kamenskij 1965.)

Although many of the specific arguments for the hypothesis are circumstantial and speculative, and although there are possible chronological problems, I believe that the Dravidian/Indo-Aryan parallelism, combined with the Vedic evidence on the prehistoric and early historic social relationship between Indo-Aryans and non-Indo-Aryans, makes it worth while to develop this convergence hypothesis so that it can be tested by other scholars.

§ 5.1 addresses the Indo-Aryan and East Iranian evidence in favor of the hypothesis. §5.2 deals with the more controversial issue of explaining Dravidian alveolar and retroflex stops as early Dravidian innovations. §5.3 draws on §§5.1 and 5.2 to set out the hypothesis that the Indo-Aryan/East Iranian and Dravidian developments are a common innovation. §5.4 discusses certain difficulties regarding the origin of the retroflex "triggers" for the Indo-Aryan and Dravidian developments. §5.5 is concerned with problems of chronology. §5.6 discusses alternatives and the consequences that arise from not accepting the convergence hypothesis.

5.1. Indo-Aryan

Let me begin with arguments and evidence that make it possible to support the "alveolarization hypothesis" that *r* + dental stop first changed into alveolar stop in some variety of Old Indo-Aryan and that this alveolar subsequently merged with either dental or retroflex, depending on the dialect. To do so it is necessary to remove several possible obstacles and, in the process, to examine relatively arcane aspects of early Vedic phonology, as well as parallels in the early East Iranian language, Avestan. The "fringe benefit" of this undertaking is that the alveolarization hypothesis raises interesting questions about both the early phonological history of Indo-Aryan and the dialectological or area-linguistic relationship between Indo-Aryan and ancient East Iranian.

As noted earlier, Indo-Aryan retroflexion is considered an innovation by all scholars, whether they attribute the change to subversion or to internal developments. The formulation of the changes in (5), repeated for convenience, is based on Hock 1975 and 1979 (with references).[20]

(5)	I	II	III	IV V	
a.	(*liǵh-to- >)	*ližδha->	*liẓdha-	>*liẓḍha-	> līḍha- 'licked'
cf.	(*wiḱ-to- >)	*wišta- >	*vista-	> viṣṭa-	= viṣṭa- 'entered'
b.	(*wiḱ-s >)	*wišš >	*wiṣṣ	> *wiṭṣ	> viṭ 'people, clan' (N sg.)
cf.	(*wiḱ-su >)	*wiššu >	*wiṣṣu	> *wiṭṣu	> vikṣu (id.) (L pl.)
					(→ post-RV viṭ-su)

For present purposes, nothing depends on the specific formulation of the changes. Under any formulation, however, the changes between the last three

stages are the phonologically most important: From III to IV, two different processes introduce retroflex stops. Of these, the one in (5a) consists of a fairly ordinary assimilation of dental stop to preceding retroflex sibilant, a change with parallels in Swedish/Norwegian (except that here retroflexion is introduced after "dark" [l]; see Steblin-Kamenskij 1965); the change in (5b) is more "idiosyncratic", involving a pre-Indo-Aryan dissimilation of geminate sibilants (see Hock 1987[21]). The crucial next step is that from IV to V: Some of the "triggers" for the change are lost; as a consequence retroflex stops are no longer fully predictable and therefore become phonologically significant.

The alveolarization hypothesis can a priori be formulated as involving changes entirely parallel to those in (5a); and this parallelism may be considered an element in favor of the hypothesis. Dental stop assimilates to preceding alveolar *r*,[22] becoming alveolar; loss of the "trigger" *r* makes the alveolar stop (*t̲* etc.) unpredictable and hence phonologically significant. See the formulation in (7).

(7) I II III
*krta > *krt̲a > *ki/at̲a (hence RV kita- : -kat̲a-)

The hypothesis, however, runs into some empirical obstacles. First, Vedic, and following it, later Sanskrit, normally retains *r* + dental stop. If there was in fact assimilation of dental *t* to alveolar *r*, the change should only have progressed to stage II.

This particular obstacle can be taken care of by adopting the common assumption that forms of the type *kitava* and *vikat̲a* are borrowings from "Vedic Prakrits", more vernacular varieties of Old Indo-Aryan that coexisted with the puristic language of the Vedic poets and which we need to posit on independent grounds.[23] All we need to assume is that, in addition to other changes characteristic of the later Prakrits, the Vedic Prakrits carried out the change(s) in (7). The dental or retroflex of "puristic Vedic", then, can be accounted for in one of two ways: Either the Vedic Prakrits had already changed the alveolar into dental or retroflex, depending on dialect; or in the borrowing process the Vedic Prakrit alveolar was nativized variably as dental or retroflex. (The second alternative might receive support from the fact that river names which can plausibly be considered Tibeto-Burman in origin show suffix variation between *-ta* or *-t̲a* (Witzel 1995) which may result from different nativizations of a Tibeto-Burman element *-t̲a*, with alveolar; see note 20 above.)

Even so, we might expect puristic Vedic to at least show traces of stage II, with alveolarization still predictable because the trigger for the change is still present. The Vedic Prātiśākhyas, however, make no mention of an alveolar articulation of dentals after *r*, even though they observe all kinds of other fine phonetic details.

Fortunately, this difficulty, too, is amenable to explanation; but significantly, the explanation raises interesting issues for early Indo-Iranian dialectology, as well as for any contact-induced account of retroflexion and alveolarization, whether of the subversion or of the convergence variety.

As George Cardona has reminded me (p.c. 1991), according to Atharva-Prātiśākhya 1.101-102 and Rik-Prātiśākhya 6.13-14, a svarabhakti vowel is regularly inserted in Vedic recitation between *r* and consonant.[24] As a consequence, dental stops would not be directly preceded by *r* in this variety of Old Indo-Aryan and thus would not become alveolar.

Svarabhakti actually had a more general motivation than just to keep alveolar *r* apart from dental stops: As is well known, *r* is the weakest of the Old Indo-Aryan consonants. (For instance, it is the only consonant that is not permitted as a geminate.) If we assume that it was especially weak in syllable-coda position, we are able to account not only for the fact that the (Vedic) Prakrits lost it in this position (with compensatory length on the preceding vowel if *r* was non-syllabic) but also for the fact that *r* is the most pervasive trigger for the gemination of neighboring consonants in puristic Vedic (a compensation for the weakening of *r* and its loss of mora-bearing ability). Svarabhakti then can be seen as an alternative to *r*-weakening employed in careful recitation: Insertion of the vowel places *r* into the onset of a syllable and thus preserves it from weakening. (See Howell 1991 for Germanic parallels to this dual behavior of *r*.)

The Rig-Vedic cooccurrence of forms like *kartá-* and *kāṭá-* in example (6a) above, then, can be explained as reflecting two different traditions—one being the puristic tradition of mainstream Sanskrit which in Vedic times pronounced *kartá-* as [kar^{a}tá] and in so doing preserved the [r] as well as the dental articulation of *t*, the other a Prakritic tradition which did not have svarabhakti and which therefore permitted *rt* to develop to an alveolar stop (with loss of [r], except for compensatory lengthening).

As it turns out, the early East Iranian language of the Avesta exhibits a similar dual treatment of *r* + consonant. Here, too, we find a general tendency to insert a vowel, generally *ə*, as in (8a). But in combinations of *r* plus voiceless dental stop we find the alternative outcome *š̰*, as in (8b). With other voiceless stops we find a similar variation, as in (8c) vs. (8d).

(8) a. kərəta 'done' (cf. Skt. kṛta)
bərətar 'carrier' (cf. Skt. bhartṛ)
b. aš̰a 'truth' (cf. Skt. ṛta)
xᵛāš̰a 'food' (from xᵛar 'eat')
cf. c. vəhrka 'wolf' (cf. Skt. vṛka)
vs. d. Gath. marəka vs. YAv. mahrka 'destruction'

Of specific interest for present purposes is the dual development of *r* + *t* clusters, because it is highly reminiscent of the relationship between the 'puristic' Rig-Vedic type *kartá* [kar^{a}tá] and the 'Prakritic' type *kāṭá*, see (9).[25] That is, in both languages, combinations of *r* (or *ṛ*) + *t* either are broken up by svarabhakti or are fused, as it were, into a new sound.

(9)	Old Indo-Aryan	Avestan
	kāṭá (from kāṯá)	aš̰a
	kartá [kar^{a}tá]	bərətar

But there is more than simple parallelism: Hoffmann 1958/67, 1971 interprets Av. *š́* as a voiceless, perhaps retroflex, lateral, comparable to Pashto retroflex *ṛ* from *rt*.[26] A priori, of course, it is possible that *š́* designates an alveolar, rather than a retroflex. In that case the assimilation in (7) may have been shared by Indo-Aryan and East Iranian. In this regard it may be significant that the "retroflex" consonants of Pashto and other northwestern languages are commonly described as (post-)alveolar, not retroflex.[27]

Support for considering the two phenomena to be related comes from the fact that there is a remarkable shared idiosyncracy as regards svarabhakti. All four Prātiśākhyas (AP 1.101, RP 6.13-14, TP 21.15-16, VP 4.16) rule out svarabhakti in the context between *r* and a sibilant + stop cluster; cf. (10a). Gatha-Avestan normally does not have *ə*-insertion in the same context; cf. (10b); occasional forms with *ə*-insertion, such as *aibī.dərəštā* can be accounted for as analogical on the model of related forms with legitimate *ə*-insertion, such as the root √*dar**ə**s-* 'see'. Even more important, where **r* + voiceless sibilant is not followed by *t*, *ə*-insertion is absolutely regular. (All of the more than 27 Gatha-Avestan occurrences of such forms have *ə*-insertion.)

(10) a.	Vedic:	No svarabkakti between r/ṛ and Sib. + Stop	
b.	GAvest.:	Normally	darštōišca (Y 33.6) etc.
		Occasionally	aibī.dərəštā (Y 21.2, 50.5) motivated by √dar**ə**s-

The lack of vowel insertion in (10) is especially noteworthy since the clusters involved are more complex than those in which insertion does take place. It is therefore highly unlikely that this restriction on svarabhakti—and svarabhakti itself—are independent phenomena in Vedic and Avestan.

We can thus conclude that early Indo-Aryan and East Iranian share a dual treatment of *r* + consonant, one with svarabhakti, the other without. While the precise conditions for the choice between these two treatments is not entirely clear in Avestan, in Indo-Aryan it appears to be socially conditioned: Svarabhakti is a feature of puristic Vedic, its absence a feature of more vernacular Vedic Prakrits.

In the case of *r* + *t* this variation is responsible for a dual development. Svarabhakti permits retention of both *r* and *t*; its absence results in an interaction between the two consonants. The outcome of this interaction most likely was an alveolar, given the evidence for a retracted articulation of Avestan *š́* and the fact that the variation between dental and retroflex in puristic Vedic can be explained as reflecting an earlier alveolar in the Vedic Prakrits.

The present account raises interesting questions regarding prehistoric linguistic contacts in northwestern South Asia and neighboring areas. But its significance and fruitfulness extend farther: By pointing out parallel phenomena which ignore the boundary between Indo-Aryan and Iranian and by providing a UNIFIED explanation for these phenomena it raises important questions for early Indo-Iranian dialectology and/or areal linguistics.

5.2. Dravidian

Most Dravidianists would accept that morphophonemic alternations of the type (11) show that certain instances of Dravidian alveolar and retroflex stops result from secondary, assimilatory developments; see e.g. Zvelebil 1970 and Krishnamurti In Press (as well as Tikkanen 1987).

(11) Dravidian retroflexion and alveolarization (data from Tamil)

a.	ceṉ 'go'	+ -t- + -ēṉ	:	ceṉṯēṉ	'I went'
	uṇ 'eat'	+ -t- + -ēṉ	:	uṇṭēṉ	'I ate'
	kol 'kill'	+ -t- + -ēṉ	:	koṉṯēṉ	'I killed'
	āḷ 'rule'	+ -t- + -ēṉ	:	āṇṭēṉ	'I ruled'
b.	kal 'stone' + tūṇ 'pillar'		:	kaṯṯūṇ	'stone pillar'
	kaḷ 'booze' + tantāṉ 'gave'		:	kaṭṭantāṉ	'gave booze'

Following Krishnamurti 1961, Zvelebil 1970:178-180[28] attempts to extend this explanation to account for root variations of the type (12a), with final alveolar or retroflex sonorant alternating with alveolar or retroflex stop. As shown in (12b), the stops of these forms can be derived from the alternating sonorants by "fusions" parallel to those responsible for the alternations in (11b). Subsequent to fusion, the resulting forms evidently were reinterpreted as simple roots in their own right, ending in alveolar or retroflex stop. (See Krishnamurti In Press for a comprehensive discussion of this reinterpretation, its pervasive nature in Dravidian, and its consequences for Dravidian morphology.)

(12) a.

Tam. kāl 'air, wind'	:	kaṯṯu (id.)
Tam. uruḷ 'to roll (itr.)'	:	uruṭṭu (id., trans.)

b. kaṯṯu < kal-tu
uruṭṭu < uruḷ-tu

The discussion of Krishnamurti (In Press, see also 1995) almost exclusively deals with verbal roots; and perusal of DEDR yields ample evidence for verbal root alternations that can be explained along the lines of (12b). But Zvelebil's Tam. *kāl : kaṯṯu* shows that alternations also occur in nominal roots; and while such alternations do not appear to be as numerous, the examples in (13) illustrate that they are not limited to just one or two words. (The examples are drawn from Zvelebil 1970 and from DEDR; numbers in parentheses indicate the entry in DEDR.)

(13) Tam. il 'house' (494) : iṯai 'inside of a roof, eaves of a house ...' (528)
Tam. āḷ 'man ...' (399) : āṭṭi 'woman ...' (400)
Tam. kāl 'air, wind' : kaṯṯu (id.)
Tam. cil 'some, few, small' (1571) : ciṯu 'small, etc.' (1594)
Tam. col 'fine rice' (Zvelebil) : cōṯu 'boiled rice' (2897)
Tam. neru-nal 'yesterday' (3578) : neṯṯu 'recently' (ibid.)
Tam. pāṇ 'song, melody' (4068) : pāṭu 'sing, chant ...' (4065
Tam. paḷḷi 'hamlet' (4018) : pāṭi 'town, city, hamlet' (4064)
Tam. purai 'ulcer, fistula' (4297) : puṯṯu 'anything scrofulous or cancerous' (4336)
Tam. puṟai 'hole, tube ...' (4317) : puṭṭi 'flask, bottle' (4265a)
Tam. peru, pēr 'great' (4411) : peṯṯam 'greatness' (4425)

Tam. pēṟai 'box, chest' (4442) : peṭṭi 'box, chest ...' (4388)
Tam. pōl 'hollow object' (4604b) : pōṭai 'hole, hollow' (4604a)
Kan. mala 'other, next' (4732) : Ta. maṭu 'another, other, next' (4766)
Tam. vaḷ 'thong, lash' (5305) : vaṭam 'cable, cord, bowstring ...' (5220)
Tam. vīṟ/viṟutu 'aerial root' (5431) : viṭutu (id.; ibid.)

For Zvelebil, accounting for alternations of this type actually was of minor significance. His major claim is the 'highly speculative and hypothetic' proposal that many (though not all) consonant clusters and geminate consonants of Dravidian can be 'further analysed ... as results of assimilations' (178).

It remained for Tikkanen 1987:285 to interpret Zvelebil's account as supporting my earlier, rather poorly substantiated claim that all of Dravidian retroflexion and alveolarization is the result of secondary developments. As Tikkanen states it,

> Both alveolarization and retroflexion of dental stops in [P]roto-Dravidian are ... reflections of the same coarticulative process, i.e. the retraction of the point of articulation after retroflex and alveolar sonorants (with or without subsequent merger) ... (285)

The processes involved are summarized in (14). As in Indo-Aryan, the first step (stage I to stage II) consists in straightforward assimilations. The loss of some of the triggers for the change (II to III) then makes the alveolar and retroflex stops unpredictable and therefore phonologically significant.[29]

(14)

		I		II		III
a.	Retroflexion:	*ṇt	>	ṇṭ		
		*ḷt	>	ḷṭ	>	ṭ
		*ṟt	>	ṟṭ	>	ṭ
b.	Alveolarization:	*n̲t	>	n̲t̲		
		*l̲t	>	l̲t̲	>	t̲
		*rt	>	rt̲	>	t̲

Dravidianists like Zvelebil, Krishnamurti, and Emeneau acknowledge that many instances of Dravidian alveolar and retroflex stops can be explained along the lines of (14), but they are evidently not prepared to accept the view that, in principle, ALL Dravidian alveolar and retroflex stops are amenable to such an explanation. For instance, Krishnamurti 1995 distinguishes between two types of alveolars and retroflexes, the "alternating" type (12)-(13) and another type for which there is no evidence of alternation. Only the alternating type is considered to result from the changes in (14), within the linguistic history of Dravidian; the non-alternating type, by contrast, is believed to be directly inherited from Proto-Dravidian.

This is indeed a possible interpretation of the evidence. But a simpler interpretation would be that ALL alveolar and retroflex stops result from changes of the type (14).

The alternations in (12)-(13) do not seem to be confined to any particular subgroup of Dravidian and therefore must be considered a feature common to all of

Dravidian. No evidence requires the assumption that they arose in a post-Proto-Dravidian stage. It is therefore entirely possible that, just like the "non-alternating" type, they go back to Proto-Dravidian.

Moreover, lack of alternation does not guarantee different origin from the alternating type. It is certainly possible that "non-alternating" forms have the same origin as alternating ones and that the two types merely differ in terms of whether or not the original forms with root-final alveolar or retroflex sonorant happen to have been preserved (in meanings that are still relatable to those of the derived forms). In this regard note that a large number of early Indo-Aryan (Vedic) forms with voiced retroflex stop are synchronically "non-alternating"; it is only because we have access to earlier, pre-Proto-Indo-Aryan stages that one can propose for some of them the same historical derivations as for synchronically "alternating" ones (see Mayrhofer 1986- : 1: 69, 187, 204, 313, 385 (with Vine 1987), 413, 415; 2: 49, 136, 326, 357, 387). Even with this access to earlier stages, a number of "non-alternating" voiced retroflex stops (and other retroflex consonants) remain unexplained. Significantly, however, it is because we have access to these earlier stages that we know Indo-Aryan retroflexion to be an innovation.

A possible counterargument is that, in contrast to early Indo-Aryan, the number of Dravidian "non-alternating" forms is very large. But given the relatively late attestation of the Dravidian languages, the large number of "non-alternating" forms may simply result from the fact that over the centuries and millennia, many of the sonorant-final base forms have become obsolete, or that their meanings have diverged too much to permit linking them to roots in alveolar or retroflex stop. If our knowledge of Old Indo-Aryan had to be derived solely from Middle or even Modern Indo-Aryan sources, the number of "non-alternating" retroflexes would no doubt be much greater, too.

Moreover, once phonologically significant alveolar and retroflex stops have arisen, it is possible to extend these stops to new contexts. In Indo-Aryan, for instance, Hoffmann 1941 argues that retroflex *-ṇḍ-* is common in words belonging to two semantic categories, of "roundness" and of "breaking, crushing", and may have been analogically introduced in many of these words because of their meaning; see note 20 above. Indo-Aryan retroflex consonants are also commonly used in newly created onomatopoeia (Hoffmann 1956). And they are found in many suspected borrowings. Similar developments may have introduced some of the "non-alternating" alveolar and retroflex stops in Dravidian. Note in this regard that retroflex consonants are very common in Emeneau's 1969 collection of Dravidian onomatopoeia.

The hypothesis that all Dravidian alveolar and retroflex stops are an innovation along the lines of (14) moreover provides a motivation for the often-noted absence of these stops in initial position: The clusters that gave rise to them, i.e. sequences of sonorant followed by dental stop, are highly unlikely to have occurred in initial position. For similar reasons alveolar and retroflex stops are barred from initial position in Norwegian and Swedish, and the Rig-Veda has initial retroflexion only in one word (*ṣaṭ* 'six' and derivatives) where it results from distant assimilation.

5.3. The "convergence hypothesis"

Accepting the hypothesis that all of Dravidian alveolarization and retroflexion is an innovation and that varieties of early Indo-Aryan and East Iranian changed *r* + dental stop to alveolar stop has important consequences.

As shown by the comparison in (15) of the major changes[30] that gave rise to Dravidian and Indo-Aryan/East Iranian alveolar and retroflex stops, these changes are remarkably similar to each other.

(15)		Dravidian	Old Indo-Aryan
a.	RETR.	*nt > ṇṭ *lt > l̤t > ṭ	*st(h) > ṣṭ(h) *zd(h) > ẓḍ(h) > ḍ(h)
b.	ALV.	*n̲t > n̲t̲ *lt > l̤t̲ > t̲	*rt(h) > rt̲(h) > Ved. Pkt. t̲(h)) *rd(h) > rd̲(h) > Ved. Pkt. d̲(h)

The parallelism of these changes is striking enough to require a reassessment of the prehistoric linguistic interaction between Dravidian and Indo-Aryan/East Iranian.

As we have seen in §2, the early Dravidian and Indo-Aryan synchronic systems, as they are usually posited, are sufficiently different that antisubversionists may doubt the cogency of the Dravidian subversion hypothesis and would therefore attribute the presence of retroflex consonants in both groups to chance.

Such a chance explanation becomes extremely difficult to justify if the early Dravidian and Indo-Aryan/East Iranian systems result from the changes in (14); for the parallelism of the developments is simply too great. On both sides, dental stops assimilate to the same class of preceding consonants—alveolars and retroflexes. On both sides, the preceding consonants are higher in sonority than the dental stops—alveolar and retroflex sonorants in Dravidian, alveolar sonorant and retroflex continuant in Indo-Aryan/East Iranian. And on both sides, the same thing happens to make the results of assimilation unpredictable and therefore phonologically significant—loss of some of the triggers for the changes.

Even the differences between the two early systems becomes smaller, since under the present hypothesis, an alveolar series is found, not only in Dravidian, but also in Indo-Aryan/East Iranian. Any remaining differences, such as idiosyncratic Dravidian *ṟ* vs. idiosyncratic Indo-Aryan *ṣ/ẓ*, are of comparatively minor significance and can be attributed to preexisting differences between the two groups. (But see also §5.4 below.)

Now, the changes in (14) are innovations in both Dravidian and Indo-Aryan/East Iranian. Moreover, there is no evidence that would force us to locate the origin of the changes in one or the other linguistic group and to assume that they spread to the other group by subversion. Rather than making an arbitrary choice it is preferable to consider the changes to reflect CONVERGENCE between the two groups. This interpretation finds support in the fact that, as we have seen in §4, the evidence of the Rig-Veda is compatible with assuming a social situation

favoring the continuing bilingualism that would encourage convergence. Moreover, as shown in Hock 1988a, it is often difficult in convergence areas to pinpoint a particular language that may have been the source for a given shared innovation.

The convergence hypothesis, if correct, is significant, for it suggests that the social relationship between Indo-Aryan and non-Indo-Aryan speakers in early India was not substantially different from what it is today—a relationship of (near-) equality that encouraged continuing bilingualism, rather than the traditional picture of marauding Indo-Aryan invaders suppressing an indigenous Dravidian population and unilaterally forcing it to learn their language.

Note further that convergence does not require direct contact. As shown in Hock 1988a, languages in a convergence area behave very much like dialects in a monolingual situation; innovations can spread from language to language, eventually covering a vast territory. The convergent changes in (14) therefore could have resulted from mediated contact, possibly involving some ancestral form of Burushaski, Tikkanen's unknown northwestern substratum, and yet other languages. As a consequence, the convergence hypothesis does not depend on a resolution of the—highly controversial—question of whether there was a Dravidian presence in the prehistoric northwest (see §3)—a clear advantage of the convergence hypothesis over the subversion account.

A quasi-dialectological view of convergence further makes it possible to account for a fact that has so far been glossed over: While early Indo-Aryan has both retroflexion and alveolarization, Avestan offers no evidence for an assimilation of dental stop to preceding retroflex sibilant. In fact, most varieties of Middle and Modern East Iranian likewise do not exhibit such a change. Exceptions are Middle Iranian Saka (*hīṣta* 'sent', related to Skt. *iṣṭa* 'sent') and Modern Pashto (with *ləṛ* 'ache' < **duždah*) and Sanglīčī-Iškāsmī (with *ṭ*< *ṣṭ* < *šť*); see Emmerick 1989, Skjærvø 1989a,b, Payne 1989, and the discussion and references in Tikkanen 1987: 289.[31] But the Pashto development is limited to voiced sibilant + dental stop; voiceless **šť* results in dental *t*; and the Sanglīčī-Iškāsmī retroflex outcome *ṭ* alternates with dental *t*. Even Nuristani, somewhat intermediate between Iranian and Indo-Aryan, only has variable traces of this development; see Tikkanen 1987:287-288 (with references). In fact, the earlier change of *šť* to *ṣ*, which produced the trigger for retroflexion, likewise shows more limited or variable distribution in Nuristani and East Iranian.

Under the convergence hypothesis, the more limited and variable distribution of the change *šť* > *ṣ* and of the retroflexion of dental stop after *ṣ* in Nuristani and East Iranian finds a ready explanation as a peripheral, transition-area phenomenon. The core area of the change must have been in South Asia proper, from which the change spread only incompletely to the Nuristani and East Iranian languages on the northwestern periphery, before coming to a complete halt in geographically even more remote Iranian territory.

Alveolarization after *r* evidently was more "vigorous" in the northwest.[32] Plausible effects of the change are found in Saka (Emmerick 1989: 215), modern

Sanglīčī-Iškāsmī, Yidgha, Pashto, and Parachi (Skjærvø 1989), as well as of course in ancient Avestan. In Avestan, Saka, and Yidgha, however, the change is restricted to clusters of *r* + voiceless dental stop. This restriction would, again, be consonant with the view that East Iranian was on the periphery of South Asian convergence and therefore only partly affected by it.

The convergence account of alveolarization and retroflexion, thus, proves to be multiply fruitful. Not only does it explain the otherwise inexplicable parallelism in the changes that gave rise to alveolar and retroflex stops in Dravidian and Indo-Aryan/East Iranian, it also provides a principled account for the more variable effects of these changes in East Iranian and other languages on the northeastern periphery. Moreover, it does so without requiring the highly controversial assumption of direct prehistoric contact between Dravidian and Indo-Aryan—a clear advantage over the subversion hypothesis. Finally, it is consonant with the Rig-Vedic evidence for the social relation between Indo-Aryans and non-Indo-Aryans, a relationship that does not differ significantly from what we encounter in later, historic times.

5.4. The triggers for retroflexion and alveolarization

In spite of all its advantages, however, the convergence hypothesis encounters some problems of its own. The most important of these concerns the origin of the retroflex and alveolar continuants and sonorants that triggered the development of retroflex and alveolar stops.

On the Indo-Aryan side the picture is reasonably clear: Indo-Aryan *r* no doubt was alveolar to begin with (Hock 1992c). Indo-Aryan retroflex *ṣ/ẓ* continues Proto-Indo-Iranian *š́/ž́*, and as argued in Hock 1975, 1984, the change of *š́/ž́* to retroflex can be motivated by the principle of polarization (for which see the more general discussion in Hock 1986/1991), to maintain the contrast with distinctively palatal *ś* from Proto-Indo-Iranian *ć*. Tikkanen 1987: 289 argues against this explanation by observing that Proto-Indo-Iranian *ć* does not change to palatal *ś* in Nuristani, which nevertheless has retroflex *ṣ*. But as he himself notes, the Nuristani counterparts of Proto-Indo-Iranian *š́/ž́* show considerable fluctuation between retroflex, a sibilant marked *š́*, and even dental sibilant.[33] (In fact, Nuristani raises difficulties for Indo-Iranian comparative linguistics, including the usual reconstruction *š́/ž́*; see e.g. Morgenstierne 1975a.) This variability is compatible with the peripheral position of Nuristani noted in §5.3. It is therefore possible that the occasional Nuristani retroflex counterparts of *š́/ž́* result from the spread of the Indo-Aryan change *š́/ž́* > *ṣ/ẓ*. In that case, there would be no problems, since as noted, polarization is well motivated in Indo-Aryan.

But what are the sources for the Dravidian alveolar : retroflex contrasts in the sonorants—*r* vs. *ṛ*, *l* vs. *ḷ*, *n*/*n̰* vs. *ṇ*?

As far as I can tell, there is nothing in the comparative Dravidian literature to suggest that this contrast is secondary, comparable to the one between Old Indo-Aryan retroflex *ṣ*, palatal *ś*, and dental *s*.[34] However, examination of the data in DEDR yields a number of semantically relatable entries whose major difference

lies in the presence of a retroflex sonorant in one entry and a corresponding alveolar sonorant in the other; see the data in (16). If these, and perhaps other, similar doublets, should indeed turn out to be related, then the retroflex : alveolar contrast of the Dravidian sonorants must be secondary, resulting from some kind of phonological split (whose conditions may no longer be recoverable). In that case, the prehistoric parallelism between Indo-Aryan (and East Iranian) and Dravidian might extend even farther than envisaged in this paper.

(16) Tam. aṉai 'approach...' (120) : Tam. aṉuppu 'send (off)' (329)
Tam. eṉ 'thought' (793) : Tam. eṉ 'say so, utter ...' (868)
Tam. iṉai 'join together'(457) : Tam. iṉam 'class, group'(531)
Kan. gāḷ(i) 'air, wind' (1499) : Tam. kāl 'air, wind' (1481)
Tam. kāṟ 'blackness, blemish ...' (1494) : karu 'black' (1278a), kār 'blackness ...' (1278c)
Tam. koḷ 'strike, hurt' (2152) : Tam. kol 'kill, murder' (2132)
Tam. naḷ 'night' (3621) : Tam. nallam 'blackness' (3613)
Kan. taḷisu 'pound, beat' (3130) : Tam. tallu 'beat, crush' (3105)
Tam. paṟiccu 'praise' (4003) : Tam. paracu 'praise' (3951); cf. pārāṭṭu (4092) 'applaud'
Tam. puṟai 'hole, tube' (4317) : Tam. purai 'tube ...' (4197)
Tam. muṟu 'all, entire' (4992) : Tam. murañcu 'be full, abundant' (4970)
Tam. muṟaṅku 'roar ...' (4989) : Tam. mural 'make noise ...' (4973)
Tam. vaṟaṅku 'move ...' (5292) : Tam. var- 'come ...' (5270)
Tam. vāḷ 'lustre, splendor' (5377) : Tam. vāl 'whiteness, purity' (5364)

While to my knowledge the alternations in (16) have not been noted in earlier Dravidianist literature, an alternation that can be linked with this type has received attention, although it also has been subject to some disagreement. As Subrahmanyam 1983:350 reports, Krishnamurti 1961 'on the basis of a small number of examples, talks about alternation of *ṯ with *ṭ ...'. The alternations are given in fuller detail in Zvelebil 1970:98 and 102 (see also 178-179); see example (17) which also includes references to DEDR. As Zvelebil notes, the alternation is especially common in Telugu, 'where verb bases with *ṯ have transitives with *ṭ. In To[da] there are also traces of this alternation' (102).

(17) Tam. kaṭi 'chew, bite ...' (1390) : kaṭi 'bite, bite off' (1124)
Tam. vaṭa 'dry up, shrink' (5320) : vāṭu 'wither, fade' (5342)
Toda pïṛy 'dust' etc. (with *ṯ according to Zvelebil) (4481) : Tam. poṭi 'powder, dust ...' (ibid.)
Toda kwïḍy 'a family of children' (1655)[35] : Tam. kuṭi 'house, family' (ibid.)
Tam. ciṯu 'small, etc.' (1594) : ciṭṭu 'anything small' (2513)

While Krishnamurti and Zvelebil evidently are convinced that alternations of the type (17) are not just accidental, Subrahmanyam considers the connection doubtful 'since the two sounds are kept distinct in numerous etymologies' (1983: 350). And Burrow and Emeneau 1984 in their introduction to DEDR consider the explanation of the alternation 'still uncertain' (xv).

The last item in (17) makes it possible to argue that the connection is valid (even though the explanation may be different from Krishnamurti's). What is relevant here is that the two stop-final roots coexist with a third root which ends in alveolar sonorant: Tam. *cil* 'some, few, small' (1571); compare perhaps also Tam. *cil* 'small piece; potsherd ...' (1577).

The relationship between *cil* and *cil̲u* is, of course, of the type (13) above, where *cil̲u* can be derived from earlier **cil-tu*, with alveolar root-final sonorant followed by dental suffix. (In fact, *cil* : *cil̲u* is included in the examples under (13).) Given the evidence in (16) it is now possible to account for the form *cil̲ṭu* as derived from a parallel form **cil̤-ṭṭu*, with root-final retroflex sonorant followed by dental suffix. By extrapolating from this well-supported case it is possible to account for the other pairs of forms in (17) under the following assumptions:

- Proto-Dravidian had an alternation of root-final alveolar and retroflex sonorants (whose origin is at this point obscure).
- Just like other root-final alveolar and retroflex sonorants these alternating sonorants could be extended by dental stops and could thus yield alveolar and retroflex stops.
- As no doubt happened with many roots in "non-alternating" alveolar and retroflex stops, the original sonorant-final root may have become obsolete, thereby making it appear that in most cases the alveolar : retroflex stop alternation in (17) is primary, rather than secondarily built on an original alveolar : retroflex sonorant alternation.

The fact that the hypothesis of a Proto-Dravidian root-final alveolar : retroflex alternation thus helps explain the alternations in (17) shows that the hypothesis is a fruitful one.

What is most significant for present purposes, however, is that the hypothesis raises an interesting question regarding the prehistory of South Asian alveolarization and retroflexion. Given that alveolar *r* and *l* are less "marked" than their retroflex counterparts, it is reasonable to explain the alternation as the result of a change from alveolar to retroflex sonorant (under as yet unknown conditions). The triggers for stop retroflexion, then, are the result of an innovation. Now, the Indo-Aryan trigger for stop retroflexion, the retroflex sibilant (whether voiced or voiceless), likewise results from an innovation. What, then, is the likelihood that the Dravidian and Indo-Aryan innovations were independent from each other? Should we conclude that these changes, too, were convergent? And if so, what are the implications for the chronology of South Asian alveolarization and retroflexion?

I do not have any answers to these questions, and perhaps it will never be possible to give a satisfactory reply. But the fact that the hypothesis advanced in this paper encourages such questions may be taken as a further element in its favor.

5.5. Problems of chronology

Beyond the somewhat hypothetical chronology problems raised toward the end of the preceding section, there is a much more concrete chronological prob-

lem. Recall that the starting point for this paper's hypothesis consisted in the similar geographic distribution of dental and retroflex outcomes of alveolar stops in Dravidian and *r* + dental stop clusters in Indo-Aryan. This similarity was explained under the assumption that Indo-Aryan *r* + dental stop did not directly change to dental or retroflex, but that it did so via an intermediate stage with alveolar stop. The alternative would have been to consider the similarity to be accidental.

From the geographical perspective, this line of argumentation is quite reasonable. But the chronology creates greater problems: Even if we assume that Vedic forms like the *kitava* and *vikaṭa* of example (6) are to be explained as different nativizations of Vedic Prakrit forms with alveolar stops (see §5.1), the evidence of the Aśokan inscriptions shows that by the third century BC, the dialectally differentiated merger of alveolar stop with dental or retroflex had been completed. In the oldest stages of the literary Dravidian languages, however, distinct alveolar geminates are maintained not only in Old Tamil, but also in the earliest records of Kannada, i.e. as late as the ninth to tenth century AD. Only Old Telugu (7th century AD) no longer distinguishes alveolar from retroflex geminates. (See Zvelebil 1970:100.) The evidence of Kannada suggests that the Dravidian merger took place some thousand years after the Indo-Aryan one.

Does this mean that we have to consider the geographical similarities in the distribution of dental and retroflex outcomes to be accidental? If so, do we have to abandon the idea that Indo-Aryan *r* + dental stop changed to dental or alveolar stop via an intermediate alveolar stop? And what are the effects for the convergence hypothesis of this paper?

The chronological difference is indeed troublesome. But there are possible ways of getting around this difficulty. One possibility is that the Old Kannada texts reflect a conservative form of the language which retained the dental : alveolar distinction, while the popular language had long abandoned it—an early stage of diglossia.

A second possibility lies in taking a closer look at the geography: Within the literary Dravidian south, the merger of geminate alveolars with dental or retroflex is even later in Tamil than in Kannada; and Malayalam still preserves geminate alveolars. That is, the merger appears to have been spreading from north to south—and at a fairly slow pace. If we back-project the direction of the spread, we will eventually reach Indo-Aryan territory; and we may hypothesize that the change originated there. Now, except for "transplanted" texts like those of Yerragudi, the Aśokan inscriptions come from locations considerably to the north of the literary Dravidian languages. If the spread of the merger was as slow-paced in its early Indo-Aryan stages as it was later in southern Dravidian, it is possible to speculate that the time difference between the Kannada merger and the Aśokan merger results from the interaction between geographical distance and the slow pace of spread.

5.6. Alternatives and their consequences

If the explanations in the preceding section for the time difference between Dravidian (Kannada) and Indo-Aryan (Aśokan) merger of alveolar with dental or retroflex are not accepted, it becomes necessary to examine alternative accounts and their consequences.

An obvious consequence of rejecting the explanations would consist in rejection of the significance of the geographical alignment between the dental and retroflex outcomes of Dravidian alveolars and Indo-Aryan *r* + dental stop clusters. Such a rejection would entail an alternative interpretation of the geographical evidence as being the result of chance.

Now, the geographical alignment was an important building block for the Indo-Aryan/East Iranian "alveolarization" hypothesis. If the alignment is considered to be due to chance, one might be tempted to reject the "alveolarization" hypothesis, too, and claim instead that *r* + dental stop changed directly to Indo-Aryan dental or retroflex, without an intervening alveolar stage. The Avestan development of *rt* to *š̌*, then, might either be an unrelated phenomenon or, if related, simply another instance of *r* + dental stop directly going to retroflex.

If the "alveolarization" hypothesis is rejected, then of course the prehistoric parallelism between Dravidian and Indo-Aryan/East Iranian is diminished. As a consequence, the "convergence" hypothesis might be rejected, too. Additional reasons for such a rejection might come from the Dravidianist side, by insisting that "non-alternating" alveolar and retroflex stops are inherited from Proto-Dravidian, rather than the result of assimilations between alveolar or retroflex sonorants plus dental stops.

In that case, we might have to return to earlier subversionist accounts of Indo-Aryan and East Iranian retroflexion. Moreover, we would have to choose between the simple Dravidian subversion hypothesis favored in traditional accounts and Tikkanen's hypothesis of an unknown northwestern substratum.

What would be the consequences of these various alternatives to the hypotheses presented in this paper?

Most obviously, return to subversionist accounts would mean a return to all the difficulties that have been observed for such accounts. To my mind the most important among these is the fact that unilateral subversion is not what we would expect, given the Rig-Vedic evidence on the social relationship between Indo-Aryans and non-Indo-Aryans, as well as the general uncertainty as to the identity of these non-Indo-Aryans (were they Dravidians, Mundas, or speakers of yet other languages?).

Beyond that, several steps in the arguments against the hypotheses of this paper call into the question the very foundations of subversionist claims:

If we attribute the geographical alignment of dental vs. retroflex outcomes of Dravidian alveolars and Indo-Aryan/East Iranian *r* + dental to chance, by what right, then, do we decide that the similarities between early Dravidian and Indo-

Aryan retroflexion can NOT be due to chance? We would have to develop a much better theory of chance similarities before we can make such a decision without appearing to be arbitrary or self-serving. (True, there is a chronological problem with the geographical alignment; but for all we know, there may have been similar chronological problems as regards Indo-Aryan retroflexion. The fact that we do not have access to relevant information on the chronology of retroflexion does not necessarily give us license to assume that there were no problems.)

Rejecting the "alveolarization" hypothesis likewise raises questions about chance: Given the alveolar articulation of Indo-Aryan *r*, is it likely that combinations of *r* + dental stop directly went to dental or retroflex, rather than to alveolar—especially in light of the fact that Dravidian and Norwegian/Swedish furnish precedents for dialectally differentiated merger of alveolar with either dental or retroflex? Moreover, rejection of the hypothesis makes the early Indo-Aryan phonological system more different from that of Dravidian, and thereby reduces the plausibility of hypotheses that want to link Indo-Aryan retroflexion to Dravidian, whether by subversion or by convergence.

Rejection of the hypothesis that all Dravidian alveolar and retroflex stops result from assimilations of dental stops to preceding alveolar or retroflex sonorants has consequences, too, since it rejects a simple, general account in favor of a more complicated one, deriving some alveolar and retroflex stops by assimilation, but others by inheritance from Proto-Dravidian. Opting for the more complex account calls into question a fundamental assumption of subversionists like Emeneau 1971b and Thomason & Kaufman 1988 that the Dravidian subversion hypothesis should be accepted because it is the SIMPLEST account. True, this is not necessarily an argument against subversion, since as noted in Hock 1996, there are independent reasons for doubting the cogency of claims based entirely on simplicity; but it does constitute a problem for subversionist argumentation. (Ultimately, the issue is not merely one of simplicity, but of "Occam's Razor" which states that elements in an argument should not be multiplied WITHOUT NECESSITY. While the "necessity rider" clearly is relevant, it also opens the way for disagreement over when a more complex argument accounts better for the data than a simpler one.)

At numerous points in this paper I noted that the hypotheses advanced in the paper are fruitful in that they explain interesting linguistic issues that go beyond the question of convergence or subversion. Rejection of these hypotheses would require offering alternative accounts for these issues.

In some cases, this should not be too difficult. For instance, my claims concerning the alternations in (16) and (17) can be maintained, even if the hypothesis is rejected that all Dravidian alveolar and retroflex stops are the result of innovation. But note that examples such as the last one in (17) suggest that the number of lexical items with secondary, rather than "non-alternating, inherited", alveolar or retroflex stop may be much larger than is commonly assumed. And this fact may raise questions about the claim that there were such "non-alternating, inherited" stops.

6. Summary and conclusions

This paper proposes a set of related hypotheses concerning South Asian retroflexion that differ significantly from earlier views. In contrast to earlier Dravidian subversion explanations and in contrast to simple rejections of such explanations, I argue for CONVERGENT changes which introduced not only retroflexion, but also alveolarization, both in Dravidian and in Indo-Aryan/East Iranian. As common in convergence areas, the changes lost momentum on the periphery, in East Iranian and Nuristani. Later convergent developments led to the merger of alveolar stops with dental or retroflex stops in Indo-Aryan and most of Dravidian. The hypothesis of convergence, rather than subversion, finds support in the Rig-Vedic testimony regarding the social relationship between Indo-Aryans and non-Indo-Aryans.

My claims and findings are significant on several counts. First, they suggest that the prehistoric relationship between Indo-Aryans and non-Indo-Aryans was not substantially different from what we find in observable history—a relationship that encouraged extended bilingual interaction with bidirectional linguistic consequences, rather than the usually assumed forced shift from non-Indo-Aryan to Indo-Aryan with unilateral linguistic consequences. By drawing on the evidence of Old Iranian Avestan, I expand the horizon for convergence (or subversion) hypotheses to East Iranian and, in so doing, raise interesting questions about early dialectal or bilingual interactions in Indo-Iranian. The assumption of convergence, rather than subversion, makes it possible to provide an explanation of this relationship (in terms of the peripheral location of East Iranian). Moreover, because convergence does not require direct contact, the hypothesis avoids the difficulty encountered by subversion hypotheses that independent evidence for prehistoric Dravidian/Indo-Aryan contact is highly controversial and that vocabulary evidence favors Indo-Aryan contact with neither Dravidian nor Munda, but possibly with some unknown northwestern language (Tikkanen 1987, 1988). Finally, in the process of developing the convergence hypothesis I advance a number of subsidiary arguments which shed an interesting light on Indo-Aryan and Dravidian historical phonology.

While reactions to earlier versions of this paper by advocates of Dravidian subversion suggest that they will not be convinced by my claims, I hope that they will consider the arguments presented in this paper to be worthy of serious discussion. Whatever the outcome of the discussion, if it is supported by alternative explanations and new data, it is bound to advance our understanding of the prehistory and early history of South Asia and of historical linguistics in general.

Notes

* This paper grows out of continuing research on the issue of prehistoric and early historic South Asian convergence. The present paper is a thorough revision of Hock 1995, which itself is a revised version of a paper read at the 1992 Annual Meeting of the American Oriental Society. A related paper has been presented on

numerous occasions, including the 1993 Linguistic Institute at Ohio State University, lectures at the Universities of Hamburg and Freiburg, and most recently at the November 1994 International Seminar on 'Ideology and Status of Sanskrit in India and Asia', International Institute for Asian Studies, Leiden (NL). (See Hock 1996.) Part of the research has been supported by grants from the University of Illinois Research Board and a spring 1995 sabbatical leave. I am indebted to Rahul Peter Das for kindly making a copy of Hoffmann 1941 available to me. I am also grateful for comments I received on earlier versions of this paper and related papers, especially from Lyle Campbell, George Cardona, Jan Houben, Murray B. Emeneau, Bh. Krishnamurti, and Sarah Thomason. I know that the three last-mentioned scholars do not agree with many of the claims in this paper; but I sincerely hope that our disagreement will stimulate further fruitful discussion. As usual, the responsibility for any errors and omissions rests with me.

[1] Nahali might constitute the remnant of yet another language family (Kuiper 1966 with references). Witzel 1995 further adds Kusunda in central Nepal, as well as possibly other languages, including that of the Veddas.

[2] See e.g. Masica 1976 and Hock 1988a.

[3] Interestingly, in other areas of close contact, Tibeto-Burman has converged with Indo-Aryan, by acquiring the contrast.

[4] For Emeneau's 1974 lexical-syntactic arguments regarding Skt. *api* : Drav. *-um*, see Hock 1975 and Gil 1994 (apparently independent of Hock 1975). For Abbi's 1992 monograph on 'reduplicated' structures, see the review in Hock 1993b.

[5] See Hock 1986/1991: Chapter 16 for general discussion. The notion "convergence" and "convergence area", Germ. Sprachbund, was introduced by Jakobson 1931 and Trubetzkoy 1931. Emeneau has introduced and popularized an alternative term, "linguistic area". For treatments of more recent South Asian convergence, both "global" and more localized, see e.g. Emeneau 1989, Gumperz & Wilson 1971, Krishnamurti 1991, Pandharipande 1982.

[6] The precise manner in which Indo-Iranian **š̌* and **ž̌* gave rise to Indo-Aryan (Vedic Sanskrit) retroflexion, the conditions under which the development took place, and the extension of retroflexion beyond its original domain are still a matter of controversy. For earlier views and literature see Wackernagel 1896, espcially pp. 164-177, and Debrunner's supplement of 1957. More recent literature is found, and referred to, in Kuiper 1967b, Hock 1975 (with 1974), Hock 1984 (with 1979, 1987), Kuiper 1991, see also Hock 1991, as well as note 20 below.

[7] Deshpande 1979 claims that the Sanskrit dental : retroflex contrast developed in post-Rig-Vedic. If correct, this would be another argument against prehistoric subversion. However, as noted in Hock 1979, the Rig-Veda offers evidence for a highly patterned, rule-governed DEGENERALIZATION of retroflex

sandhi across word boundary, an early phase of a change that gets virtually completed in the Classical period. We must therefore assume that retroflexion was introduced prehistorically, before the attested Rig-Vedic texts.

[8] Dravidian *ṟ* is occasionally written *ẓ*, but Krishnamurti 1969:318, n. 18 notes that there is no strong empirical evidence for this phonetic interpretation. Typologically, a system with a voiced obstruent not matched by a corresponding voiceless one is rare enough to require more than cursory justification. Note further that in the traditional Tamil alphabetical arrangement retroflex *ṟ* holds the same position relative to retroflex *ḷ* as alveolar *r* to alveolar *l*.

[9] See for instance Tikkanen 1988.

[10] The value of the tradition is weakened by the claim that the Brahuis came from Aleppo, in present-day Syria [!], but this element may reflect a later "Islamization" of an earlier tradition according to which the Brahuis are immigrants to the area.

[11] The extreme southeastern inscriptions from Yerragudi are most similar to those of north-central Kalsi. Since their language is clearly transplanted (the inscriptions are found deep in Dravidian territory), they cannot be relied on for dialectological judgments. The evidence of Gandhari Prakrit (with predominant dental) must likewise be ignored, since the language is transplanted, too. (The dental outcome might suggest an original affiliation closer with southwestern Girnar than with northwestern Gandhara, since the northwestern Aśokan inscriptions have predominant retroflex.)

[12] Note in this regard that unlike the south- and northwestern inscriptions, Kalsi does not substitute *r* for the *l* of the eastern inscriptions in words like *lājā/rājā* 'king'.

[13] As I became aware only after having examined (and reexamined) the Aśokan inscriptions, Turner did in fact connect the modern distribution to the Aśokan northwest : central : eastern distribution advocated here.

[14] Southworth's modern retroflex distribution is based on text frequencies. The highest retroflex : dental ratios are found in Sindhi, Gujarati, Marathi and the Dravidian south, the lowest ratios in Panjabi, Hindi, the Bihari languages, and Bangla, with the remaining areas having an intermediate ratio. Unfortunately Southworth does not indicate the texts on which his statistics are based.

Examining versions of the "Prodigal Son", representative of the different languages (and major subdialects) in Grierson 1903-1928, I arrive at rather different text frequencies and distributions: The highest retroflex : dental ratios (1 : 1-2.5) are found in a discontinuous Indo-Aryan area comprising Sindhi, Rajasthani, and Pahari dialects, and in Malayalam. Among the major languages, Kashmiri, Nepali, and Bangla have the lowest ratios (1 : 30 for Kashmiri, 1 : 9-15 for Nepali and Bangla). Intermediate ratios of 1 : 3-8 are found in most of South Asia, including the northwest and most of the Dravidian south. The northwest has

a number of pockets with significantly lower retroflex ratios (beside Kashmiri, note e.g. Burushaski with 1 : 33, Ormuri with 1 : 13.5, and Khowar with 1 : 58.5); there are similar pockets in the central area around Nahali (Gondi of Mandla with 1 : 13.5, Kurku with 1 : 34; see also Kuiper 1962: 255).

Whatever these geographical distributions may indicate about the history of South Asian languages, they do not support Southworth's grouping of Gujarati and Marathi with Sindhi and the entire Dravidian south, a grouping which is crucial for his claim that there was a strong prehistoric Dravidian presence in present-day western Indo-Aryan.

[15] See Subrahmanyam 1983, Zvelebil 1970. Northwestern Brahui does not offer any conclusive evidence for geminate alveolar *tt*; but as Emeneau 1971b observes, single alveolar *t* merges with retroflex *ṭ*, not with the dental; that is, its outcome is parallel to the dominant retroflex outcome of *r* + dental stop in northwestern Indo-Aryan.

[16] For most of Dravidian, only the geminate alveolar stop is considered; single alveolar stop generally changes to a liquid, commonly an [r]-sound. For Tamil, the conservative, literary retention of *tt* is assumed. (The dialectology of non-conservative, colloquial, and vernacular Tamil is quite complex and also, to my knowledge, not yet fully investigated. It appears that different varieties prefer dental or retroflex outcomes.) The geographically easternmost Dravidian languages have assibilated outcomes of geminate alveolar stops; these are not included in Map V.

[17] See for instance Hock 1991 and 1993a on early Indo-Aryan.

[18] Lengthening of the vowel preceding the cluster appears to depend in these early attestations on whether the *r*-sound was non-syllabic or syllabic. In the former case, *r* added a mora in the coda of the syllable so that its loss resulted in compensatory lengthening; in the latter case, there was no compensatory lengthening. (In later attestations, the loss of non-syllabic *r* in coda more commonly resulted in compensatory lengthening of the following consonant.)

[19] As I hope to show elsewhere, a similar north-to-south alignment between Indo-Aryan and Dravidian can be observed in the modern distribution of retroflex vs. dental (or rather, alveolar) nasals and laterals.

[20] See also note 6. More problematic is the question of "sponteneous retroflexion", as in RV *atati* 'wanders' vs. later *aṭati*. Developments of this type, too, have been attributed to subversion (e.g. Kuiper 1967a, Emeneau 1974); but alternative solutions have been proposed.

Some retroflexes have been explained by sporadic internal developments (e.g. dissimilation), others as borrowings from "Vedic Prakrits" or as anticipations of changes that become regular in Middle Indo-Aryan; cf. the discussion and references in Wackernagel 1889, Hoffmann 1941, Hock 1975, 1984, and 1991, Vine 1987.

If some of the developments should have been the result of contact, languages other than Dravidian might furnish alternative, or even more plausible sources: As argued in Hock 1984, since Dravidian has a contrast dental : retroflex, it is 'difficult to see how [the substitution of retroflex consonants for dentals] could be attributed to the mistakes made by Dravidians trying to speak a Sanskrit with undifferentiated dentals (cf. Emeneau 1974). Rather, just as in the case of modern-day contacts between Westerners and South Asians, I would expect speakers LACKING the contrast to make mistakes in trying to speak a language which has it. (Perhaps speakers of early forms of Munda, or of Tibeto-Burman, might be involved?)' In fact, if Indo-Aryan "dentals" had really been post-dental/alveolar, one would have expected the substitution of Dravidian alveolars; this is precisely what we find in Malayalam in nativizations of English words with alveolars.

Support for Tibeto-Burman provenience of some lexical items with "spontenous retroflexion" may be found in the fact that, except where it has undergone South Asian influence, Tibeto-Burman has undifferentiated alveolars which could be nativized either as dentals or as retroflexes in languages like Indo-Aryan which already had a contrast dental : retroflex (whether that contrast was due to subversion or not). That this is not just a thought experiment is suggested by the evidence in Witzel 1995 for river names ending in *-ta* or *-ṭa* (with apparent dental : retroflex variation) at the Himalayan border of Vedic Sanskrit, i.e., an area where a Tibeto-Burman presence is most likely. Interestingly, *kirāta*, the name of a non-Aryan people mentioned in the Rig-Veda and tentatively identified as Tibeto-Burman by Witzel, has a Pali variant with retroflex, *kirāṭa*.

Hock 1991 adds the further possibility that some "spontaneous" changes of dental to retroflex may have resulted from inner-Indo-Aryan differences suggested by the Prātiśākhyas (such that a 'tooth-root' *t* of one variety of Vedic could be reinterpreted as postdental and therefore retroflex in another variety whose *t* was interdental).

We should also consider the possibility that retroflexes replaced earlier dentals through sporadic analogical developments. In this regard note Hoffmann's 1941 observation that most Sanskrit words with retroflex *-ṇḍ-* belong to one of two semantic categories, that of "roundness" and that of "breaking, crushing". As Hoffmann correctly notes, this fact makes it possible that *-ṇḍ-* was secondarily extended to words belonging to one or the other of these categories.

[21] As I realized when rereading Kuiper 1967b for this paper, my 1987 account is similar, even though by no means identical, to that of Kuiper. I take this opportunity to add the reference to Kuiper's article to my 1987 paper.

[22] On the Vedic articulation of *r* see Hock 1992c.

[23] Kuiper's 1991 rejection of this explanation ignores the well-known independent evidence for the existence of Vedic Prakrits (for which see the discussion and references in Hock 1991). See also the evalution by Oberlies 1994.

[24] The Vājasaneyi- and Taittirīya-Prātiśākhyas specify svarabhakti only between *r* and sibilant (4.16 and 21.15-16, respectively). This is the context for which the Atharva- and Rik-Prātiśākhyas teach a fuller (half- or quarter-mora) version of svarabhakti, while before stop they recognize a shorter (1/8-mora) version. One suspects that the Vājasaneyi and Taittirīya-Prātiśākhyas do not describe a different 'dialect', but merely overlook the shorter, less noticeable variety of svarabhakti. (See further below for a restriction on svarabhakti even before sibilant, if followed by stop.)

[25] Earlier discussions of the Avestan situation that I am aware of do not consider this parallel with Old Indo-Aryan. Miller 1968 argues that structures of the type (8a), with *r* + *ə* + voiceless dental stop, are morphological renewals which, by undoing the conditioned development in (8b), reassert the morphological transparency of synchronically analysable forms. Kellens 1989 and Beekes 1988 ignore Miller's position and reassert the old claim that the difference between (8a) and (8b) is accentually conditioned. After a careful survey of all relevant Gatha Avestan forms, Beekes is able to maintain this view only by claiming that Iranian accentuation differed in a number of forms from the one of Vedic, even though the conditions for accent shift are no longer discernible. (He further claims that the change to *ṣ̌* was post-Gathic, but I do not find his arguments convincing.) None of these approaches offer a satisfactory account for the fluctuation in (8d).

[26] The view that the sound designated by the symbol «š» is some kind of retracted sound is supported by the fact that it reflects an earlier cluster involving POST-DENTAL, alveolar *r* and that in early Avestan it is distinguished from two other *š*-sounds of different, non-alveolar origins: a plain «š» (reflecting ordinary PIIr. *š*) and a palatal «ṧ» (resulting from palatal *c* + *y*). (See Hoffmann 1971.)

[27] Could the alveolar articulation of retroflex stops in many varieties of modern Hindi-Urdu be due to the influence of the Muslim conquerors, at least some of whom came from the northwest? Other, apparently less urban (or urbane) varieties have strong retroflex articulation, a fact which suggests that alveolar pronunciation is an urban overlay.

[28] See also p. 175, note 5.

[29] The fact that in (11a) the triggers are not lost may be cause for concern. But their presence can be accounted for as the result of analogical restoration of the root-final sonorants; in synchronically opaque structures such as (12) and (13), non-nasal triggers regularly are lost. The difference between geminate and non-geminate retroflex and alveolar stops in (12) and (13) can be explained with Krishnamurti (In Press) as reflecting the difference between geminate and simple dental stop in the input. In example (12b), taken from Zvelebil, the inputs therefore should be rewritten as **kal-ttu* and **uruḷ-ttu*.

[30] The (retroflex) sibilant dissimilation in (5b) is an idiosyncracy of Indo-Aryan and is therefore not included in the comparison.

[31] Tikkanen adds Yidgha, for which Skjærvø does not list the variant with retroflex stop.

[32] There is also a wide-spread and robust distribution of *ṣ* resulting from earlier *s* + *r* or *r* + *s* in the northwest, found in Nuristani, Middle and Modern East Iranian, and even northwestern Middle and Modern Indo-Aryan; see Tikkanen 1987:287-289, Morgenstierne 1947:234-235, von Hinüber 1986:28-29. The antiquity of the phenomenon is not clear; in Indo-Aryan, the input *s* may reflect earlier palatal **ś*. Since **ś* > *s* is a Middle Indo-Aryan innovation, it appears that the change of *s* + *r* or *r* + *s* may be a relatively recent phenomenon.

[33] For another source of *ṣ* see the preceding note.

[34] Zvelebil 1970:177, however, notes in passing the correspondence Tam. *aṇmai* 'nearness, being near' : *aṉpu* 'love', which is obviously related to the first item in (16) below, but he does not discuss its significance. A further exception might be Levitt 1989; but I find the arguments of the paper difficult to penetrate.

[35] The DEDR puts a question mark next to the Toda word.

References

DEDR = Burrow & Emeneau 1984.

ABBI, Anvita. 1992. Reduplication in South Asian languages: An areal, typological, and historical study. New Delhi: Allied Publishers.

BEEKES, Robert S. P. 1988. A grammar of Gatha-Avestan. Leiden: Brill.

BHAT, D. N. S. 1971. The Koraga language. Poona: Deccan College, Postgraduate and Research Institute.

——. 1973. Retroflexion as an areal feature. Stanford University Working Papers on Language Universals 13: 27-67.

BLOCH, Jules. 1911. Review of Denys de S. Bray, The Brahui language, 1. Journal asiatique, 10e série, 17: 1: 162-167. (Repr. in Bloch 1985.)

——. 1925. Sanskrit et dravidien. Bulletin de la Société de Linguistique de Paris 25: 1-21. (Repr. in Bloch 1985.)

——. 1929. Some problems of Indo-Aryan philology. Bulletin of the School of Oriental Studies (London) 5: 719-756. (Repr. in Bloch 1985.)

——. 1946. Brahui et tsigane. Journal of the Royal Asiatic Society 1946: 199-201. (Repr. in Bloch 1985.)

——. 1950. Les inscriptions d'Asoka. Paris: Les Belles Lettres.

——. 1985. Recueil d'articles de Jules Bloch (1906-1955), ed. by C. Caillat. Paris: Collège de France, Institut de Civilisation Indienne.

BÜHLER, George. 1864. On the origin of the Sanskrit linguals. Madras Journal of Literature and Science, No. I, Third Series, 116-186. [I have not been able to see this article; reference in Wackernagel 1896: 165 and elsewhere.]

BURROW, Thomas, & Murray B. Emeneau. 1984. A Dravidian etymological dictionary. 2nd ed. Oxford: Oxford University Press.

CALDWELL, Robert. 1856. A comparative grammar of the Dravidian or South Indian family of languages. First edition. London. (Third edition repr. 1974, New Delhi: Oriental Books.)

CHATTERJI, Suniti Kumar. 1926. The origin and development of the Bengali language. Calcutta: University Press. (Repr. 1970, London: Allen & Unwin. Also distributed by Motilal Banarsidass, Delhi.)

COMRIE, Bernard. 1981. The languages of the Soviet Union. New York: Cambridge University Press.

DESHPANDE, Madhav. 1979. Genesis of Ṛgvedic retroflexion: A historical and sociolinguistic investigation. Aryan and non-Aryan in India, ed. by M. Deshpande and P. E. Hook, 235-315. Ann Arbor: Center for South and Southeast Asian Studies, University of Michigan.

——. 1993. Aryans, non-Aryans, and brāhmaṇas: Processes of indigenization. Journal of Indo-European Studies 21: 215-235.

ELIZARENKOVA, Tatyana J. 1995. Language and style of the Vedic ṛsis. Albany: State University of New York Press.

EMENEAU, Murray B. 1954. Linguistic prehistory of India. Proceedings of the American Philosophical Society 98: 282-292. (Repr. in Emeneau 1980.)

——. 1956. India as a linguistic area. Language 32: 3-16. (Repr. in Emeneau 1980.)

——. 1969. Onomatopoetics in the Indian linguistic area. Language 45: 274-299. (Repr. in Emeneau 1980.)

——. 1971a. Dravidian and Indo-Aryan: The Indian linguistic area. Symposium on Dravidian civilization, ed. by Andrée F. Sjoberg, 33-68. Austin & New York: Jenkins Publishing & Pemberton Press. Repr. in Emeneau 1980.

——. 1971b. Kodagu and Brahui developments of Proto-Dravidian *ṟ. Indo-Iranian Journal 13: 176-198. (Repr. in Emeneau 1994.)

——. 1974. The Indian linguistic area revisited. International Journal of Dravidian Linguistics 3: 92-134. (Repr. in Emeneau 1980.)

——. 1980. Language and linguistic area: essays selected by A. S. Dil. Stanford, CA: University Press.

——. 1989. The language of the Nilgiris. Blue Mountains: The ethnography and biogeography of a South Indian region, 133-143. (Repr. in Emeneau 1994.)

——. 1994. Dravidian studies: Selected papers, ed. by Bh. Krishnamurti. Delhi: Motilal Banarsidass.

EMMERICK, Ronald E. 1989. Khotanese and Tumshuqese. Schmitt 1989: 204-229.

GELDNER, Karl Friedrich. 1951. Der Rig-Veda ..., 3 vols, posthumously edited by Charles R. Lanman. Cambridge, MA: Harvard University Press.

GIL, David. 1994. Conjunctive operators in South-Asian languages. SALA XV: Papers from the Fifteenth South Asian Language Analysis Roundtable Conference 1993, ed. by A. Davison and F. M. Smith. Iowa City: South Asian Studies Program, University of Iowa.

GONDA, Jan. 1975. Vedic literature. (A history of Indian literature, 1:1.) Wiesbaden: Harrassowitz.

GRIERSON, George. 1903-1928. Linguistic survey of India, 11 vols. Calcutta. Repr. 1968, Delhi: Motilal Banarsidass.

GUMPERZ, John J., & Robert Wilson. 1971. Convergence and creolization: a case from the Indo-Aryan/Dravidian border. Pidginization and creolization of language, ed. by D. Hymes, 151-168. Cambridge: University Press.

HAHN, Ferd. 1911. Kurukh grammar. Calcutta: Bengal Secretariat. Repr. (no date), Delhi: Mittal.

HALE, Wash Edward. 1986. Ásura in early Vedic religion. Delhi: Motilal Banarsidass.

HINÜBER, Oskar von. 1986. Das ältere Mittelindisch im Überblick. (Österreichische Akademie der Wissenschaften, Phil.-hist. Klasse, Sitzungsberichte 467.)

HOCK, Hans Henrich. 1974. Historical change and synchronic structure: The case of the Sanskrit root nouns. Toward tomorrow's linguistics, ed. by R. W. Shuy & C.-J. N. Bailey, 329-42. Georgetown University Press. (Repr. in International Journal of Dravidian Linguistics 4: 215-28 (1975).)

——. 1975. Substratum influence on (Rig-Vedic) Sanskrit? Studies in the Linguistic Sciences 5: 2: 76-125.

——. 1979. Retroflexion rules in Sanskrit. South Asian Languages Analysis 1: 47-62.

——. 1982a. AUX-cliticization as a motivation for word order change. Studies in the Linguistic Sciences 12:1: 91-101.

——. 1982b. The Sanskrit quotative: A historical and comparative study. Studies in the Linguistic Sciences 12: 2: 39-85.

——. 1984. (Pre-)Rig-Vedic convergence of Indo-Aryan with Dravidian? Another look at the evidence. Studies in the Linguistic Sciences 14: 1: 89-107.

——. 1986/1991. Principles of historical linguistics. Berlin: Mouton de Gruyter. (Second revised edition, 1991, ibid.)

——. 1987. Regular contact dissimilation. A Festschrift for Henry Hoenigswald, ed. by G. Cardona & N. Zide, 143-53. Tübingen: Narr.

——. 1988a. Historical implications of a dialectological approach to convergence. Historical dialectology, ed. by J. Fisiak, 283-328. Berlin: Mouton de Gruyter.

——. 1988b. Review article: Finiteness in Dravidian. (Sanford B. Steever (1988): The serial verb formation in the Dravidian languages.) Studies in the Linguistic Sciences 18: 2: 211-31

——. 1991. Dialects, diglossia, and diachronic phonology in early Indo-Aryan. Studies in the historical phonology of Asian languages, ed. by W. G. Boltz and M. C. Shapiro. Amsterdam & Philadelphia: Benjamins.

——. 1992a. Reconstruction and syntactic typology: A plea for a different approach. Explanation in historical linguistics, ed. by G. W. Davis & G. K. Iverson, 105-121. Amsterdam & Philadelphia: Benjamins.

——. 1992b. Review of Tikkanen 1987. Kratylos 37: 62-68.

——. 1992c. Were *r̥* and *l̥* velar in early Sanskrit? Vidyā-Vratin: Professor A. M. Ghatage felicitation volume, ed. by V. N. Jha, 69-94. (Sri Garib Dass Oriental Series, 160.) Delhi: Sri Satguru Publications.

——. 1993a. A critical examination of some early Sanskrit passages alleged to indicate dialectal diversity. Comparative-historical linguistics: Indo-European and Finno-Ugric: Papers in honor of Oswald Szemerényi III, ed. by B. Brogyanyi & R. Lipp, 217-232. Amsterdam & Philadelphia: Benjamins.

——. 1993b. Review of Abbi 1992. Studies in the Linguistic Sciences 23: 1: 169-192.

——. 1995. Subversion or Convergence? The issue of pre-Vedic retroflexion re-examined. Symposium on Language and Prehistory in South Asia, University of Hawaii, March 1995.

——. 1996. Pre-Ṛgvedic convergence between Indo-Aryan (Sanskrit) and Dravidian? A survey of the issues and controversies. Ideology and status of Sanskrit: Contributions to the history of the Sanskrit language, ed. by J. E. M. Houben, 17-58. Leiden: Brill.

HOFFMANN, Karl. [1941]. Die alt-indoarischen Wörter mit *-ṇḍ-*, besonders im Ṛgveda. Unpublished doctoral dissertation, München.

——. 1956. 'Wiederholende' Onomatopoetika im Altindischen. Indogermanische Forschungen 60: 254-264. (Repr. in Hoffmann 1975.)

——. 1958/67. Altiranisch. Handbuch der Orientalistik 1: 4: 1: 1-19. Leiden: Brill. (Repr. in Hoffmann 1975:58-76.)

——. 1971. Zum Zeicheninventar der Avesta-Schrift. Festgabe deutscher Iranisten zur 2500Jahrfeier Irans, 64-73. (Repr. in Hoffmann 1975:316-326.)

——. 1975. Aufsätze zur Indoiranistik, vol. 1, ed. by J. Narten. Wiesbaden: Reichert.

HOWELL, Robert B. 1991. Modern evidence for ancient sound changes: Old English breaking and Old High German vowel epenthesis revisited. Stæfcræft: Studies in Germanic linguistics, ed. by E. H. Antonsen & H. H. Hock, 65-73. Amsterdam: Benjamins.

JAKOBSON, Roman. 1931. Über die phonologischen Sprachbünde. Travaux du Cercle Linguistique de Prague 4: 234-240.

KELLENS, Jean. 1989. Avestique. Schmitt 1989: 32-55.

KONOW, Sten. 1906. (Discussion in vol. 4: 279 of Grierson 1903-1928.)

KRISHNAMURTI, Bh. 1961. Telugu verbal bases: A comparative and descriptive study. Berkeley & Los Angeles: University of California Press. [In spite of repeated attempts I have not been able to secure a copy of this book. My citations are based on references in other works.]

——. 1969. Comparative Dravidian studies. Current trends in linguistics, ed. by T. A. Sebeok, 5: 309-33. The Hague: Mouton.

——. 1991. The emergence of the syllable types of stems (C)VCC(V) and (C)V̄C(V) in Indo-Aryan and Dravidian: Conspiracy or convergence?. Studies in the historical phonology of Asian languages, ed. by W. G. Boltz and M. C. Shapiro, 160-175. Amsterdam & Philadelphia: Benjamins.

——. 1995. Patterns of sound change in Dravidian. Symposium on Language and Prehistory in South Asia, University of Hawaii, March 1995.

——. In Press. The origin and evolution of primary derivative suffixes in Dravidian. Historical, Indo-European, and lexicographical studies for Ladislav Zgusta in honor of his 70th birthday, ed. by H. H. Hock. Berlin: Mouton de Gruyter.

KUIPER, F. B. J. 1962. Nahali: A comparative study. (Mededelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afd. Letterkunde, N.R., 25: 5.) Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.

——. 1966. The sources of Nahali vocabulary. Studies in comparative Austroasiatic linguistics, ed. by N. H. Zide. The Hague: Mouton.

——. 1967a. The genesis of a linguistic area. Indo-Iranian Journal 10: 81-102. (Repr. in International Journal of Dravidian Linguistics 3: 135-153 (1974).)

——. 1967b. The Sanskrit nom. sing. *viṭ*. Indo-Iranian Journal 10: 103-125.

——. 1991. Aryans in the Rigveda. (Leiden Studies in Indo-European, 1.) Amsterdam and Atlanta, GA: Rodopi.

——. 1992. Rigvedic loanwords. International Journal of Dravidian Linguistics 21: 1-49.

KULKE, Hermann, and Dietmar Rothermund. 1986. A history of India. Repr. 1990, New York: Dorsett.

LEVITT, Stephan Hillyer. 1989. The alternation of *r* and *l* in Dravidian. Indian Linguistics 50: 130-147. (Published in 1991.)

MACDONNELL, Arthur Anthony, & Arthur Berriedale Keith. 1912. Vedic index of names and subjects, 2 vols. Repr. 1958, Delhi: Motilal Banarsidass.

MANSION, Joseph. 1931. Esquisse d'une histoire de la langue sanscrite. Paris: Geuthner.

MARLOW, Patrick. Forthcoming. Origin and development of the Modern Indo-Aryan quotative and complementizer: an areal approach. University of Illinois Ph.D. dissertation in Linguistics.

MAYRHOFER, Manfred. 1986-. Etymologisches Wörterbuch des Altindoarischen. Heidelberg: Winter.

MILLER, D. Gary. 1968. *rt*-clusters in Avestan. Language 44: 274-283.

MORGENSTIERNE, Georg. 1947. Metathesis of liquids in Dardic. (Det norske videnskapsakademi i Oslo, Skrifter, 1947: 2.) (Repr. in Georg Morgenstierne 1975b.)

——. 1975a. Die Stellung der Kafirsprachen. Morgenstierne 1975b: 327-343.

——. 1975b. Irano-Dardica. Wiesbaden: Reichert.

OBERLIES, Thomas. 1994. Review of Kuiper 1991. Indo-Iranian Journal 37: 333-349.

PANDHARIPANDE, Rajeshwari. 1982. Counteracting forces in language change: convergence vs. maintenance. Studies in the Linguistic Sciences 12: 2: 97-116.

PARPOLA, Asko. 1988. The coming of the Aryans to Iran and India and the cultural and ethnic identity of the dāsas. International Journal of Dravidian Linguistics 17: 2: 85-229.

PAYNE, John. 1989. Pāmir languages. Schmitt 1989: 417-444.

POTT, August Friedrich. 1933, 1836. Etymologische Forschungen auf dem Gebiete der indogermanischen Sprachen, 1 and 2. Lemgo: Meyer.

RAMANUJAN, A. K., & Colin Masica. 1969. Toward a phonological typology of the Indian linguistic area. Current trends in linguistics, ed. by T. A. Sebeok, 5: 543-577. The Hague: Mouton.

RAU, Wilhelm. 1957. Staat und Gesellschaft im alten Indien nach den Brāhmaṇa-Texten dargestellt. Wiesbaden: Harrassowitz.

SCHMITT, Rüdiger (ed.). 1989. Compendium linguarum iranicarum. Wiesbaden: Reichert.

SKJÆRVØ, Prods O. 1989 (a). Modern East Iranian languages. Schmitt 1989: 370-383.

——. 1989 (b). Pashto. Schmitt 1989: 384-416.

SOUTHWORTH, Franklin C. 1974. Linguistic stratigraphy of North India. International Journal of Dravidian Linguistics 3: 201-223.

STEBLIN-KAMENSKIJ, M. I. 1965. Om alveolarer og kakuminaler i norsk og svensk. Norsk Tidskrift for Sprogvidenskap 20: 18-27.

STEEVER, Sanford B. 1988. The serial verb formation in the Dravidian languages. (MLBD Series in Linguistics, IV.) Delhi: Motilal Banarsidass.

SUBRAHMANYAM, P. S. 1983. Dravidian comparative phonology. Annamalainagar: Annamalai University.

THOMASON, Sarah Grey, & Terrence Kaufman. 1988. Language contact, creolization, and genetic linguistics. Berkeley & Los Angeles: University of California Press.

TIKKANEN, Bertil. 1987. The Sanskrit gerund: A synchronic, diachronic, and typological analysis. (Studia Orientalia, 62.) Helsinki: Finnish Oriental Society.

——. 1988. On Burushaski and other ancient substrata in northwestern South Asia. Studia Orientalia 64: 303-325.

TURNER, R. L. 1921. Gujarati phonology. Journal of the Royal Asiatic Society. Repr. in Turner 1973 = 1985: 88-145.

——. 1924. Cerebralization in Sindhi. Journal of the Royal Asiatic Society. Repr. in Turner 1973 = 1985: 206-227.

——. 1926. Middle Indian *-d-* and *-dd-*. Festgabe Hermann Jacobi. Repr. in Turner 1973 = 1985: 239-250.

——. 1973 = 1985. Indo-Aryan linguistics: Collected papers, ed. by J. Brough. Repr. 1985, Delhi: Disha Publications.

VINE, Brent. 1987. Vedic *kūláyati* and "spontaneous cerebralization" in Sanskrit. 14th International Congress of Linguists, Berlin, 1987. (Published in the Proceedings, ed. by W. Bahner, J. Schildt, and D. Viehweger, Berlin: Akademie-Verlag.)

WACKERNAGEL, Jakob. 1896. Altindische Grammatik, 1. Göttingen: Vandenhoeck & Ruprecht. Second edition, 1957, with a new introduction by L. Renou and Nachträge by A. Debrunner, ibid.

WITZEL, Michael. 1995. The linguistic situation in 1000 B.C. Symposium on Language and Prehistory in South Asia, University of Hawaii, March 1995.

ZIMMER, Heinrich. 1879. Altindisches Leben. Berlin: Weidmann.

ZVELEBIL, K. 1970. Comparative Dravidian phonology. The Hague: Mouton.