Lipp, Reiner, *Die indogermanischen und einzelsprachlichen Palatale im Indoiranischen* (Heidelberg: Winter, 2009). Band I: Neurekonstruktion, Nuristan-Sprachen, Genese der indoarischen Retroflexe, Indoarisch von Mitanni, xxx + 458 pp., ISBN 978 3 825 35247 9. Band II: Thorn-Problem, indoiranische Laryngalvokalisation, xxx + 594 pp., ISBN 978 3 825 35248 6.

This two-volume work is a substantially extended version of the author's 1994 Freiburg dissertation directed by Helmut Rix. Despite its title, this book treats most of the problems of Indo-Iranian consonant phonology, along with numerous related topics in other branches of Indo-European. The first volume contains the first four chapters treating the developments of Proto-Indo-European palatal stops in Indo-Iranian. Chapter 1 discusses how primary palatal stops came about in the part of Proto-Indo-European that later developed into the *satəm* languages. After estimating the pronunciation of primary and secondary palatals in Indo-Iranian languages in Chapter 2, the author proceeds on to consider in Chapter 3 how these sounds developed within the Indo-Aryan, Iranian and Nuristani branches. Chapter 4 treats how Indo-Aryan and Iranian sounds of palatal origin are reflected in Mesopotamian and Anatolian documents. The second volume contains the last two chapters. Chapter 5 covers extensive topics related to Indo-European 'thorn' clusters, and Chapter 6 is on the vocalization of Indo-European laryngeals in Indo-Iranian. Both volumes contain the same front matter and 105-page bibliography. I am not competent to judge the validity of the discussions on individual forms from subgroups other than Indo-Iranian, and will mainly review the phonological arguments.

The basic assumptions in Lipp's arguments are summarized in the following five points:

(i) Proto-Indo-European dorsal stops have often been reconstructed as consisting of three series, i.e. palatals (*$\hat{k}$, *$\hat{g}$, *$\hat{g}^{h}$), velars (*k, *g and *g^{h}) and labiovelars (*k^{w}, *g^{w} and *g^{wh}), of which the latter two sets are believed to have merged in the *satəm* languages, i.e. the Indo-Iranian, Baltic, Slavic, Armenian and Albanian subgroups, while the first two sets had merged in the other subgroups, the so-called *centum* languages (Mayrhofer 1986: 104ff.). The author argues that Proto-Indo-European palatal stops, reflected as distinct from velars and labiovelars only in the *satəm* languages, were originally allophones of velar stops before front vocoids, an idea propounded for example by Meillet (1934:91ff.). Having examined words which are reconstructed with palatal stops in non-palatalizing contexts (I:53–96), Lipp argues that these palatalized allophones were phonemi-

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cized only in the *satəm* languages through paradigmatic leveling, while they remained conditioned allophones of velar stops and were never phonemicized in the *centum* languages (I:8, I:53). If palatal and velar stops were distinct in the *centum* languages, which are cladistically distant from each other compared to the *satəm* languages, merger of palatal and velar stops must have happened within each subgroup. But such merger is typologically rare and cannot be considered to have taken place independently (I:30). This palatalization of velar stops was at first limited to the part of Indo-European from which Indo-Iranian developed, but it spread to other groups in close contact, a cross-branch spreading explainable by Johannes Schmidt's Wave Theory (I:10).

(ii) Proto-Indo-European palatal stops *k̂, *ĝ, *ĝʰ have traditionally been explained to have developed to 'alveolopalatal' affricates *ć, *ǰ, *ǰʰ in Proto-Indo-Iranian, while *ḱ, *ǵ and *ǵʰ, which stand for secondarily palatalized velars and labiovelars, are considered to become 'palatoalveolar' affricates *č, *ǰ, *ǰʰ (Hoffmann 1988/1992:872, Mayrhofer 1989:6). Lipp argues (I:146ff.) that Proto-Indo-European palatals *k̂, *ĝ, *ĝʰ had become palatoalveolar affricates *č, *ǰ, *ǰʰ in Proto-Indo-Iranian, which were further fronted to the alveolar place of articulation in Iranian and Nuristani, while secondarily palatalized velars and labiovelars *ḱ, *ǵ and *ǵʰ remained prepalatal affricates *cç, *ʝʝ, *ʝʝʰ until the end of the common Indo-Iranian era. According to the author, PIIr. *č, *ǰ, *ǰʰ are palato-alveolars and not alveolopalatals, for a phonemic system with a contrast between alveolo-palatal [tɕ] etc. and prepalatal [tç] etc. is typologically unlikely (I:148).

(iii) Lipp extends the Proto-Indo-Iranian deocclusion of PIIr. *č < PIE *k̂ to *š, which is traditionally believed to occur before a stop as in YAv. *ašta* vs. Sanskrit *aṣṭá* 'eight' < PIE *$h_2$ok̂tóh$_1$, to a context *after* a stop as in Avestan *fšu-* 'livestock' < PIE *pk̂-u- (I:142, II:10), advancing the suggestion of Burrow (1959:87). This extended rule accounts for the development of Proto-Indo-European "thorn" clusters not as a result of metathesis and spirantization of a dental stop, but as spirantization of a primary and secondary palatal after a stop (see below). The affricate status of secondarily palatalized velars and labiovelars *ḱ etc. in Proto-Indo-Iranian, another tenet of the book mentioned in (ii) above, goes well with their spirantization, for affricates become fricatives more easily than stops do.

(iv) In Indo-Iranian, Proto-Indo-European clusters of a velar or labiovelar stop and *s regularly become *kš > Sanskrit *kṣ*, Avestan *xš* (also *γž* in Old Avestan). On the other hand, it is not quite clear through what intermediate stages the sequence of a primary palatal and *s develops to Sanskrit

kṣ and Avestan *š*. Based on the monophonematic reflex of PIE *k̂s etc. in Iranian as in YAv. *dašina-* vs. Sanskrit *dákṣiṇa-* 'right', Lipp considers that PIE *k̂s developed > *čs > *čš (by the RUKI-rule) > *tš within Proto-Indo-Iranian (I:150, 212, II:17), which became a single phoneme *č in Iranian and Nuristani but underwent a dissimilatory development > *ṭṣ > *kṣ* in Indo-Aryan as Kuryłowicz (1951/1973:129) and Burrow (1959:87) considered, e.g. PIE *déḱs-ino- > PIIr. *dátšina-, > Ir. *dáčina- > YAv. *dašina-*, > IA *dáṭṣina- > Skt. *dákṣiṇa-*.

(v) In Indo-Iranian, the Indo-European laryngeals (*h_1, *h_2, *h_3) between consonants are believed to have developed to the vowel *i, along with aspiration of the preceding stop in the case of *h_2. While in Indo-Aryan *h_2 develops at least doubly as a vowel and aspiration, as in PIE *$d^hugh_2tér$- f. 'daughter' > Sanskrit *duhitár-*, in Iranian it just aspirated the preceding *g and was not vocalized, as is shown by the application of Bartholomae's Law to one of the Iranian reflexes of this word (OAv. *dugədar-* where *-gd-* < *-gd^h- < *-g^ht-), and this divergent realization has posed a serious question regarding the phonetic nature of the 'vocalization'. Following Mayrhofer (1986:138), Lipp considers that laryngeals remained consonantal and explains the vocalization to *i as vowel epenthesis before or after them, with subsequent loss of them in individual languages. To solve the problem that intervocalic laryngeals do not consistently become *i* but are often lost in Iranian except in the initial syllable, the author posits epenthesis before and after a laryngeal that resulted in moraic *i and extra-short *i (II:389 ff.), along with the rules of contextual loss of them in Iranian.

The results of Lipp's work have implications for several pivotal issues of the linguistic history of Indo-Iranian.

The Nuristani languages have been considered to constitute the third branch of the Indo-Iranian subgroup, but their genetic relationship with Iranian or Indo-Aryan is an unsettled issue, for the Nuristani languages share phonological and lexical features partly with Iranian and partly with Indo-Aryan. As we saw in (ii) above, Lipp assumes that Indo-Iranian primary palatals, which were palato-alveolar affricates, were fronted to alveolar affricates in Proto-Iranian. Based on this reconstruction, the author argues that the reflex of primary palatals as alveolar affricates and the distinction of the Proto-Indo-Iranian primary palatals from the secondary palatals indicate that Nuristani is an early offshoot of Iranian (I:156 ff.), a hypothesis Mayrhofer (1984) put forward. Lipp considers that the lexical similarity of Nuristani to Indo-Aryan is partly because the former took part in some

morphological innovations of the latter (I:162) as shown in Kati *wosut* 'spring', Sanskrit *vasantá-* vs. YAv. *vaŋri* 'in spring', and that the developments of *R̥H > *ir* as in Ashkun *drigala* (with metathesis to *ri*), Sanskrit *dīrghá-* vs. OAv. *darəga-* and of *TsT > TT as in Kati etc. *čit* 'mind', Sanskrit *cittá-* vs. Avestan *čisti-*, which Nuristani shares with Indo-Aryan, are due to convergence.

As the Prātiśākhyas do not explicitly mention that palatal stops are affricates, some have suspected that they were still plosives in Sanskrit (e.g. Allen 1953:52; I:105). Lipp considers that primary palatals were not plosives but palato-alveolar affricates in Sanskrit, as palatals are pronounced today in New Indo-Aryan (I:106 ff.), giving arguments such that *k̂ and *ĝʰ would not have become the fricatives *ś* and *h* in Sanskrit if they had been plosives, that Mitanni Indo-Aryan forms suggest affricate pronunciation of Indo-Aryan *c* and *j*, and that Sanskrit *c* and *j* are transliterated in Greek with τζ (Byzantine)/ τι and δι (Ptolemy) respectively. Positing affricate pronunciation of palatals further back in Proto-Indo-Iranian, mentioned above in (ii), leads to new explanations of disputed sounds and sound sequences, especially (*c*)*cʰ*. This sound, originating from PIIr. *sč < PIE *sk̂, shows mysterious aspiration and loss of the first *s-element. After turning down the traditional explanation as early Prakritism, Lipp explains (I:176) that PIIr. *sč, pronounced [štš] in pre-Vedic, lost the first fricative part and became Sanskrit *cc*ʰ [tšš/tš], while in Iranian the cluster PIIr. *sč became [sts] by alveolarization and then underwent simplification to [ts], which led to reflexes such as Avestan *s* and Old Persian *θ*. The author considers that the original pronunciation of Indo-Aryan palatal stops as palato-alveolar affricates and that of *ś* as a palato-alveolar fricative have been preserved as such until New Indo-Aryan (I:144).

In Kobayashi (2004:73 ff.), I set up a hypothesis that Proto-Indo-Aryan had a stage in which there was a phonological restriction against complex segments, which led to wholesale deocclusion of primary palatals on the one hand and to the loss of *s in PIIr. *sć > *cc*ʰ, while palatalized velars were still stops and did not undergo deocclusion. According to this explanation, *ĝ must have once become *ʒ/ʑ, which then merged with *j* from secondarily palatalized velar *g and labiovelar *gʷ. To support his argument, Lipp cites Mitanni Indo-Aryan reflexes of primary palatals, such as the affricate reflex of *ĝ in the Hittite form *KURtiu̯azza(š)* personal name < *sāti/a-vāja-* and the fricative reflex of *ĝʰ as *š* in *u̯ašanna* 'racecourse'. Since there is no factual support for the restriction against pre-Vedic Indo-Aryan affricates I posited, I am willing to withdraw it, if Mitanni Indo-Aryan as we

know it from Hittite script uniquely represents the pre-Vedic Indo-Aryan pronunciation.

In Avestan, Proto-Indo-European primary palatals *k̂, *ĝ and *ĝʰ, which were palato-alveolar affricates *č, *ǰ and *ǰʰ in Proto-Indo-Iranian, were fronted and spirantized to alveolar sibilants *s* and *z* (ii), except before stops and *n* where they remained palato-alveolar sibilants *š* and *ž*. While the secondarily palatalized velars and labiovelars are considered to have become palato-alveolar affricates *č* and *ǰ* (and also *ž* between vowels and before /i̯/, under the "Arachosian" influence according to Hoffmann 1988/1992:872), as reflected in the spelling practices such as *-t̰.c-* in YAv. *frātat̰.caratō* f.nom.pl. 'flowing forward' from *tac-* 'to flow' (I:113), Lipp suggests the possibility that they were still prepalatal affricates in Old Persian on the basis of Greek transcription (I:116 ff.).

Another aspect of Indo-Aryan phonology for which Lipp draws upon Mitanni Indo-Aryan forms is the origin of the Indo-Aryan retroflex sibilant *ṣ*. When Proto-Indo-Iranian *č developed to *š in Indo-Aryan, Proto-Indo-Iranian *š ([+distributed, +high]), which arose from *s by the RUKI-rule as well as from *č adjacent to a stop, became retroflex *ṣ* ([–distributed, -high]) by a *push chain*, as a development within Indo-Aryan independent from neighboring languages (I:249). As for the RUKI-rule, Lipp considers that it took place when the *satəm* languages were still a common dialect continuum (I:38). The place of articulation of *ṣ* was the same as palato-alveolar *ś*, as the assimilation *suška- > *śuṣka-* 'dry' suggests, but the active articulator was the back part of the tongue (I:104). Since retroflex articulation is not found in Old Iranian, this change must have taken place after the divergence of Indo-Aryan from Proto-Indo-Iranian, but it was not by substratum influence of other language groups in the subcontinent that it occurred, because Mitanni Indo-Aryan, an old variety of Indo-Aryan before the Indo-Aryans entered the subcontinent, already shows spirantization of *č to *ś*, and *ǰʰ to *ś* (I:263).

The dental-dorsal cluster (*TK) of Proto-Indo-European is considered to have undergone metathesis in branches other than Anatolian and Tocharian and become *KT, of which *T changed to a fricative allophone *þ. Pointing out the discrepancy that the dental stop of an original *KT cluster remains unaffected (II:7), Lipp gives an explanation without metathesis or *þ (II:10), an idea originally proposed by Burrow (1959:87 f.). Since Lipp postulates that PIIr. *č was spirantized to *š after as well as before a stop as we saw above in (iii), it follows that the Proto-Indo-European cluster *TK became PIIr. *Tš if the dorsal element is a palatal stop *k̂, *ĝ or *ĝʰ, and by

another postulation that Proto-Indo-Iranian *tš becomes Indo-Aryan *kṣ* via *ṭṣ (iv), PIE *TK develops to Indo-Aryan *kṣ* by regular sound changes only, without such an intermediate stage as *kþ, e.g. PIE *h_2ŕ̥tk̂o- 'bear' > PIIr. *Hŕ̥tša- > *ŕ̥ṭṣa- > Sanskrit *ṛ́kṣa-*, *d^hg^{wh}i-néH-ti 'is lost' > Sanskrit *kṣiṇāti*. This development also explains the curious paucity of tautomorphemic TK sequences in Indo-Aryan. However, metathesis can be dispensed with only in Indo-Iranian, for it is still necessary to account for Greek and Latin forms such as ἄρκτος and *ursus* from *h_2ŕ̥tk̂o- with metathesis (II:11, 25).

Sound change has long been discussed in historical linguistics and there is some consensus on what changes are possible and what are unlikely. Especially, typology provides criteria to judge the plausibility of proposed sound changes, and in this area recent years have seen great progress such as Kümmel's collection of consonant changes (Kümmel 2007). However, typology does not predict how a given sound will change, and when we posit intermediate stages it is desirable to support them with models, principles or theoretical frameworks. In this respect, there might be room for improvement in the argumentation of this book. When the author postulates developments such as *tš > *ṭṣ > *kṣ* (I:150), *sč > *šč > čš (*cś/cc^h*) (I:176), or *tc/tsc > *tʦš > *cc* (I:177), it is not always clear what phonological principles motivate each change. Since no explicit principle is mentioned, questions would arise, e.g. if *ṣ* < *š assimilates the preceding *t, why does the *ṭ* have to be dissimilated to *k* when followed by *ṣ* < *š, or why does the *č in PIIr. *šč have to remain occlusive in the development *šč > čš (*cś/cc^h*)? When *d^hi-d^hb^h-sé/ó- > PIIr. *d^hidbz^{h}á- is explained to develop to *d^hibz^{h}á- > Sanskrit *dípsati* 'tries to harm' (I: 232), it is not mentioned which consonant of the cluster is to be simplified, while Mayrhofer's rule #TK > #K/__N̥ (Mayrhofer 1986:152, 157) is evoked *ad hoc* to account for the change *dk̂m̥t-óm > *k̂m̥tóm 'hundred' (II:88). Or when PIIr. *sč is explained to become Sanskrit *cc^h* (I: 176), it remains unexplained why the cluster becomes aspirated, especially since *cc* [tʧ] is not aspirated. On the other hand, deaspiration of *ǰ^h in a tautosyllabic cluster, which is posited to explain *$d^hĝ^h$m-és > *jmáḥ* gen.sg. of *kṣám-* f. 'earth' (II:89), needs to be argued more carefully, given the existence of *hn-* in the root *hnav-* 'deny'. And also, it would be safer to give posited intermediate forms with asterisks unless they are philologically confirmed. The reasoning itself is not without problems either. Based on the lack of statements prohibiting affricate pronunciation of Sanskrit palatal stops in the Prātiśākhyas and based on the affricate pronunciation

of Middle Indo-Aryan palatal stops, Lipp argues that they were affricates already in the Vedic period because of the continuity (I:111), but the evidence can be interpreted in other ways as well and the argument is logically weak.

In several places, Lipp draws on linguistic theories to support his argument, such as the use of Wave Theory and Lexical Diffusion to explain phonemicization of palatals and distribution of *-ṭ* and *-k* as in Ṛgveda *vik-ṣú* vs. later Sanskrit *viṭ-ṣu*, locative plural of *víś-* f. 'settlement', respectively. In explaining the phonetic value of Indo-Iranian palatals, it is postulated that changes occur so that the consonants are evenly distant from each other with respect to the place of articulation (I:31). This teleological view of sound changes advocated by Martinet (1970:62) is not necessarily an accepted view in speech science. While a similar view that distinctive sounds are distributed in such a way as to maximize perceptual contrast is proposed regarding vowels by the phonetic theory of Adaptive Dispersion (Lindblom 1986), consonants are more complex to capture in such a model (cf. Stevens 1989). Furthermore, Labov's studies of near merger, again on vowels, show that sounds which are perceptually so close that even speakers themselves cannot distinguish them can still be distinct phonemes (Labov 1994:357 ff.).

In I:32–36, Lipp discusses the characteristics common to the context of the RUKI-rule (*i, *u, *r, and dorsal stops), and follows Martinet in grouping them as [+high]. However, treating any variety of rhotics as [+high] would not find support in Chomsky and Halle's model of distinctive features, which is primarily based on articulation (Clements and Hallé 2010:4) and sometimes falls short of grouping sounds with acoustic similarity as a natural class. In that sense, the attempt of Vennemann (1974:95) to group these sounds as sharing the acoustic property of 'lowering the frequencies of the energy concentration' is more to the point. A similar selective tendency in citation is found in Lipp's discussion on the Indo-Iranian middle participle suffix (II:445–448). Since Klingenschmitt (1975:159 ff.), this suffix is reconstructed as *-mh$_1$no- with *h$_1$, which is vocalized as *ī* in Middle Indo-Aryan *-mīna-*/*-mīṇa-*, ε in Greek -μενος and *a* in Tocharian B *-mane*. Following Benveniste (1933), Melchert (1983:24 ff.) proposes an explanation from the locatival suffix *-mō(n)-/ *-mnó- without *h$_1$, which is equally possible. Although understandable, given the focus of the book on classic or prehistoric languages, few studies on modern languages are considered: for example, in the discussion on PIE *ḱ̂ep-h$_2$-ó-, Sanskrit *śaphá-*, YAv. *safa-* 'hoof' (I:13) and PIE *dék̂m̥ 'ten' (II:15),

it would be relevant at least to mention corresponding forms from Bangani such as *kɔpɔ* 'hoof' and *dɔkɔ* 'ten' (Abbi 1997:3, 6), whether or not the author accepts the data of this Garhwal language of disputed affiliation.

Citations from original texts are occasionally marked with infelicities. For example, Lipp cites "spätved. *dhānā-bhr̥ǰǰ-* 'Getreide röstend' mit Nom.Sg. m.f. *dhānā-bhr̥ṭ* Pāṇini" in I:210, but the closest form I could find in Vishva Bandhu's index was *dhānā-bharjanam* in Kātyāyana-Śrautasūtra 5.8.16, and *dhānā-bhr̥ṭ* should rather be attributed to the Kāśikāvr̥tti on Aṣṭādhyāyī 8.2.36 *vraśca-bhrasja-* … than Pāṇini himself (Debrunner's Nachträge 93 on Wackernagel 1896/1957:174). In I:323, *ēwak* is given as the Middle Persian form for 'ein, einzig', but it would be better to give the original spelling <'dwk'> as well, for McKenzie (1967:27) considers this to be a historical spelling for /ēk/ based on the Manichean form <yk>.

Lipp's argument regarding modern pronunciation is potentially misleading. He takes up the Bengali sibilant [ʃ] and regards it as preservation of Vedic pronunciation (I:100). As is well known, Old Indo-Aryan sibilants *ś*, *ṣ*, *s* merge in most Middle Indo-Aryan languages except those in the Northwest, and are explained to become *ś* in Magadhi by native grammarians. One has to be very cautious in calling a variation archaic, for one can talk about archaism only when the relevant feature serves to distinguish phonemes in that language, and desirably when that language preserves other old features as well. In languages where all sibilants had once merged to one, its place of articulation is non-distinctive and hence phonologically irrelevant, and the coincidence of the place of articulation with Vedic is rather to be considered an accident than preservation of an archaic feature. As is also the case with Kortlandt's claim (Kortlandt 1981:17) that the glottalic stop system of Proto-Indo-European is preserved in the New Indo-Aryan language Sindhi, we need to be cautious in connecting antiquity with variation found in a living language, for the latter might as well be a result of secondary developments.

Since the book covers the phonology of the obstruents of Indo-Iranian and other branches so extensively, and since Lipp builds a close-knit argument that often cross-refers, it would greatly benefit from an index of at least forms and sound changes cited. Still, this book is to be commended for thoroughly reviewing previous studies on Indo-Iranian historical phonology for over a century and presenting plausible and con-

sistent explanations based on all the currently available philological evidence.

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Abbreviations

K	dorsal stop
OAv.	Old Avestan
PIE	Proto-Indo-European
PIIr.	Proto-Indo-Iranian
T	dental stop
YAv.	Younger Avestan

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