INHALT

Zum Geleit .................................................. 7
BABA, I.: Commentationes ad Anonymi Belae Regis Gesta Hungarum .. 13
DOBRODOMOV, I. G.: Тюркизм, а не мадьяризм офенского языка .......... 23
DOERFER, G.: Exclusiv und Inclusiv in der Geheimen Geschichte der Mongolen .................................................. 29
ECSEDY, I.: On the religious tolerance in Burial Traditions on the Silk Road .......................................................... 35
GOLDEN, P. B. The Dogs of the Medieval Qipchaqs ................................... 45
GULYA, J.: Kertbeny über Reguly .................................................. 57
HAJDÚ, P.: O. Donner and J. Budenz on linguistic affinity ...................... 63
JOHANSON, L.: On syllabic frontness oppositions in Turkic .................. 77
KAKUK, S.: Auf welchem Wege gelangten osmanisch-türkische Lehnwörter in die ungarische Sprache? ................................. 95
KARA, Gy.: Adali .................................................................. 103
KLJASTORNYJ: Дунечске графитти из Приазовья .................................. 111
KRISTÓ, Gy.: Über die Hunnenträdition der Ungarn .................................. 117
MILLER, R. A.: An Altaic word for 'Altaic'? ......................................... 127
POPPE, N.: Mongolian loanwords in Kazak ........................................ 149
RÉDEI, K.: Wogulisch *nälwa* 'ans Ufer; flüßabwärts' .......................... 153
SCHAMİLOĞLU, U.: The end of Volga Bulgarian .................................. 157
SINOR, D.: Quing-yar: a curious Mongol appellation of the Turks .......... 165
SZÁDECZKY-KARDOSS, S.: Vernachlässigte Quellenangaben zur Geschichte des ersten awarischen Khaganates .......................................................... 171
TAUBE, E.: *əlajaniy* - *alanîy* - ā. Die Einleitungsformel eines altai- tuwinischen Erzählers als ethnographische Quelle ................................ 183
URAY, G.: The Location of Khar-can and Leñ-ču of the Old Tibetan Sources .......................................................... 195
URAY-KŐHALMI, K.: Böge und beki: Schamanentum und Ahnenkult bei den frühen Mongolen .......................................................... 229
VÁSÁRY, I.: Notes on Turkic *yunčug* 'vexation' and its etymological background .......................................................... 239
ZIEME, P.: Der Essenz-Śloka des Saddharma-pudarika-Sūtras ................ 249
The f/b opposition and linear phonemics. The phonological opposition of frontness vs. backness (f/b) is a basic feature in Turkic, present in all known historical periods, even in the most deviating dialects. Its description, however, involves considerable problems. Particularly, linear phonemics as applied in more recent Turcological publications proves an inappropriate basis for intralingual analyses as well as for interlingual comparisons.¹

Though the bulk of linguistic work in Turcology long remained 'prephonological' (Hazai 1978, 78), the value of phonology now seems unquestioned, some of its varieties even being overrated.² Already Bazin (1959, 11) claims that phonemic analyses of Turkic languages allow us—unlike purely phonetic descriptions—to 'saisir presque du premier coup d’oeil une architecture simple et claire, constante en ses lignes principales'. In our view, however, a clear and economical picture of the phonological 'architecture' cannot be gained by phonemic methods, structuralist or generative, that map all functionally relevant features onto successive segments. The problem is particularly obvious in the description of f/b oppositions.

¹ I wish to thank Éva A. Csató, Oslo, Michael Dobrovolsky, Calgary, and Claus Schoenig, Mainz, for valuable comments on a first draft of the present article.

² Though the phoneme is nowadays frequently used in Turcology, its theoretical status mostly remains vague. The term often stands, without notice, for both primitive elements and morphophonemes. We have criticized (1) this practice, (2) the widespread view that phonemic analysis can be carried out without knowledge of crucial phonetic facts, and (3) the misuse of the phoneme as a unit for describing phonotactic details (Johanson 1979b).
Vowel segments. Turkic f/b oppositions are usually thought to be expressed by distinctive vowel segments. Phonemic analyses generally recognize a number of vowels occurring at least in the primary stem (often the first syllable) and forming oppositions in the dimensions [±front], [±high], and [±round]. In spite of all variation, the first opposition, that of "back versus front vowels" is claimed to be ubiquitous (Poppe 1965, 182).

All such suggestive ideas about a perfectly symmetrical vowel scheme, a "parfait équilibre de tout le système vocalique turc" (Bazin 1959, 11 f.), nevertheless prove deceptive. They miss numerous exceptions found in individual dialects and, more important, some common and general properties. Modern Turkic languages show a great deal of obvious deviation from the ideal scheme, and the older ones at least offer several questionable cases. As we know, the older script systems overall render vowels in a less differentiated way. The most explicit of them, the East Turkic so-called "runic" script, is thought to possess vowel signs distinguishing front and back roundness as well as a number of 'paired' consonant signs showing the front-or backness of adjacent vowels. Not even these notational resources are, however, sufficient to exclude considerable asymmetries of the vowel system as early as in Orkhon Turkic: reduced vowels, a neutral schwa phoneme, lack of /i/, etc.

Consonant segments. As is well known, an f/b differentiation is also observable in consonants, most perceivably in dorsal obstruents, i.e. [k]-, [g]- sounds, and in the lateral [l]. The Uigur, Manichæan, Arabic, and many modern alphabets use distinct back and front dorsal signs. The runic script seems to go farther: as regards the so-called 'paired' letters, in each pair, one sign is thought to stand for a front consonant and the other sign for a back one. Amazingly enough, f/b variants are distinguished even by B, D—, T—, Y—, N— and R—runes, i.e., also in some cases where the existence of clear articulatory differences seems improbable.\(^3\)

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\(^3\) According to Trubetzkoy, "koennen die Vokalphoneme auch unabhaengig von der konsontantischen Umgebung eine bestimmte Eigentoneigenschaft aufweisen, wahrend die Konsonanten nur in Verbindung mit Vokalen palatalisiert bezw. velarisiert sind /.../. Daher sind die Eigentoneigenschaften bei den Vokalen phonematisch, wobei die palatalisierten und velarisierten Spielarten der Konsonanten nur kombinatorische Varianten ohne distinktive (aber mit delimitativer) Kraft darstellen" (1939, 251 f.).

\(^4\) Articulatory differences are, of course, not impossible here; all of these segments can, e.g., be heard as velarized in Modern Turkish. On the other hand, we would
Phonetic f/b differences may lead to the recognition of distinct consonantal segments such as [k], [g], [l] vs. [q], [γ], [l]. Generally, such segments are considered as phoneme variants. Proto—Turkic */k/, */g/, */l/ are thought to have split into back and front allophones in most languages, producing a 'consonant harmony' with vowel qualities as conditioning factors.5

This view has resulted in a distributional axiom to the effect that the f/b quality of consonants, in older and most later languages, is determined unequivocally by the adjacent vowels. According to the homogenizing principle of transcription now often applied to older Turkic texts, no front vowel can occur in words containing a sign for, e.g., [q], and vice versa. Consonantal differentiation is considered dispensable if vowels are differentiated. This practice, postulating a much more 'symmetrical' sound pattern than found in any known Turkic language, seems to presuppose that older, unknown linguistic structures are necessarily simpler than well documented later ones.

Sometimes, the consonantal segments in question are referred to as 'phonemes'. This is often the case in languages where the corresponding vowel distinctions are thought to be neutralized; e.g., Uzbek /q/ (Sjoberg 1962, 8 ff.). Hattori (1982, 209) claims that the merge of */i/ and */i/ has led to the splitting of Proto—Turkic */k/ into the two phonemes /q/ and /k/; and that this can be considered "the first step towards the decay of vowel harmony in Turkic". Some scholars (e.g. Menges 1968, 81) use the term phoneme for [k], [q], [g], [γ], [l], [l], etc. in a general sense, viz. regardless of distinctiveness; however, such approaches are not necessarily "prephonological".

No conditioning factor. In view of the confusing variation actually found, it is understandable if 'phonemicists', in concrete cases, hesitate whether to assign f/b distinctiveness to vowels or to adjacent consonants. Remarkably enough, however, according to some of these scholars, neither the vowels nor the consonants constitute the distinctive segments.

Thus, Bazin claims that "le phonème K—" in Turkic is realized as [k] before front vowels and as [q] before back ones, but, at the same time, he takes the vocalic f/b difference to be allophonic, i.e., nondistinctive vocalic properties allegedly condition consonantal ones (1959, 13 f.). Similarly, Pritsak characterizes Ancient East Turkic [q] as an allophone occurring in back environments; nevertheless, he also allows it to occur before the front phon-
eme /i/ (1963, 32 f.). In traditional analysis of Uzbek, the quality of vowels such as [u] and [ü] is, as Comrie points out (1981, 66), said to be determined by the adjacent consonants, but the quality of the consonants is in turn determined by the adjacent vowel. According to Doerfer, Khalaj has, on the one hand, undifferentiated phonemes such as /k/ and /i/; on the other hand, variants such as [q] and [i] are said to be conditioned by adjacent phonemes (1971, 139 ff., 152). Thus, the conditioning factors in strings like [ki] and [qi] remain unclear. Doerfer himself, however, now seems fully aware of the limited value of a "phonemic" analysis of this kind (see the discussions in Doerfer and Tezcan 1980, 63 ff., and in the phonological chapters of Doerfer 1988).

**Syllabic features.** These and similar inconsistencies obviously arise from the fact that linear approaches in general grant very little insight into the basic sound patterns in question. Descriptions based on phonemes as primitive contrastive elements—minimal bundles of subelements—involves problematic limitations. The reason is, in our opinion, that the Turkic f/b features are essentially *syllabic.*

The Turkic syllable, taken here as a basic phonotactic unit—consisting of a vowel peak, optionally flanked by consonantal segments, i.e., onset or and coda—shows a clear tendency towards f/b homogeneity, i.e., the feature [±front] tends to continue throughout a given syllable. If there is any basic and general characteristic of Turkic 'sound harmony' at all, it is the **f/b classification of syllables.**

The **intrasyllabic harmony** in Turkic is an assimilatory tendency, explainable by ease of articulation and partly predictable from universal phonetic constraints. The important point is that it shows a high degree of phonologization in all known Turkic languages.

From a diachronical as well as a synchronical—phonematic point of view, the question immediately arises, which of the segments is the assimilatory one. This question will be disregarded here. Under a more functional aspect, it appears preferable, as we will see, not to describe the intrasyllabic harmony as a phenomenon based on segmental properties, but to assign a shared [±front] feature to the whole stretch affected. The distinctiveness

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6 See the remarks in Johanson 1974. Cf. the renewed interest in the syllable in current generative phonology, where several arguments have been offered for recognizing the syllable as a hierarchical unit in phonological representation (see, e.g., Clements and Keyser 1983).

7 E.g., certain consonants are expected to be fronted before front vowels.
obviously does not belong to individual segments in a systematic way. As materials from different Turkic languages and dialects show, the fundamental and unquestionable 'bipolarity of the sounds' (Menges 1968, 73 f.) rather concerns syllables.

The few technical details of our approach can briefly be summarized as follows. Frontness will be symbolized by {'}, backness by {"}. The employment of morphonological brackets { } is motivated by the nonlinear, suprasegmental analysis. The feature [± front], which distinguishes strings like kəl 'come' and qəl 'remain', kəl 'ashes' and qəl 'slave', kəl 'lake' and qəl 'arm', is extracted from the individual segments and treated as suprasegmental, e.g., {kal} : {"kal}, {kul} : {"kul}, {kol} : {"kol}. If two segments differ from each other only with respect to the feature [± front], e.g., [q] : [k], [I] : [I], or [a] : [ä], we will refer to them as a segment pair. Individual segments which more or less clearly signal the f/b character of the syllable will be called signal segments.  

Cognate approaches. Our suprasegmental treatment is, in some respects, reminiscent of Harris' ideas about 'long components' (1944), the 'prosodic' analyses proposed by Waterson (1956) and Lyons (1962),\footnote{Cf. Robins' treatment of Russian palatalization (usually considered distinctive in the consonant and redundant in the vowel) as a feature which extends across both vowel and consonant (1957).} or the 'autosegmental' approach suggested by Clements and Sezer (1982). None of these frameworks will, however, be adopted here. Only partly comparable is Baskakov's view (1966), according to which [± front] and [± round] are properties of the word and the primary stem, respectively. Here, the already mentioned dogma of a strict symmetry ("старая симметрия") of basic oppositions leads to the remarkable conclusion that not even [± high] is a vowel property and that Turkic vocalism consists of one single vowel phoneme. To be sure, it seems possible to handle [± round] as a syllabic feature as well; we shall, however, refrain from this in the present article.\footnote{Labial syllables would then be marked as {"}, and illabial ones as {'}; the symbols {a} and {i} would stand for low and high vowels, respectively: e.g., {"kil} = [qul], {'kil} = [kül], {'kal} = [qa'], etc.}

Runic script. An important point which can only be touched upon in this paper is the fact that the suprasegmental analysis is in accordance with the structure of the runic script, the syllabic character of which should be taken more seriously than has hitherto been the case.

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Cf. Robins' treatment of Russian palatalization (usually considered distinctive in the consonant and redundant in the vowel) as a feature which extends across both vowel and consonant (1957).
The 'paired' letters are commonly thought to distinguish back and front consonants, optionally including 'inherent' vowels, mostly [a] and [ä]. Certainly, Orkhon Turkic consonants such as [l, r, n] might have had different articulations in front and back environments; cf. palatographic data of modern Turkic languages. But it would be odd to suppose that the function of, e.g., \( b^1 \) and \( b^2 \) was to mark two kinds of [b]-sounds, since these hardly appear as signal segments in any known Turkic language or dialect.\(^{11}\) In our view, the function of the 'paired' letters was simply one of distinction between front and back syllables regardless of the actual distribution of \( f/b \) contrast in the articulation of individual segments involved. This principle is an important clue for the analysis of later stages of development as well.

**Intersyllabic harmony.** Intrasyllabic harmony is the basis for the long-domain phenomenon of intersyllabic harmony, i.e., the agreement of syllables, within a phonological word, in their \( f/b \) specification. This phenomenon is mostly referred to as "vowel harmony", a rather misleading term. A more appropriate one is "synharmonism" which alludes to the comparison with musical tonality quoted at the beginning of the present article: the word imagined as a string of sounds in a certain key (Trubetzkoy 1939, 251).

As is well known, there are two basic cases of intersyllabic harmony. First, the harmony may hold within primary stems (which are, from a synchronic point of view, monomorphemic, but possibly polysyllabic). This should be distinguished from suffixal harmony, i.e., the case when suffixes ('harmonic' suffixes) possess two forms which are chosen according to the \( f/b \) character of the preceding stem (which may already end in a suffix). Note that the *prima facie* criterion for the \( f/b \) classification of syllables is their choice of variants of following harmonic suffixes, i.e., whether they govern front or back harmony.

Categoric statements about the Turkic word as a harmonic unit are often misleading—and may lead to false conclusions about earlier stages of development. Even if there are tendencies towards \( f/b \) agreement of all segments within the phonological word (including 'vowel harmony'), this is an 'ideal' state seldom attained; moreover, we often observe strong counter-currents. Instead of going into the details of the realization of intersyllabic harmony, we shall comment briefly upon various real or alleged exceptions from it. Several cases must be distinguished in this respect.

\(^{11}\) Trubetzkoy (1939, 251) points out that the consonant \( y \) has no palatalized or velarized variants and that many Turkic words consist of vowels and \( y \) only (\( ay \) 'moon', \( ayu \) 'bear' etc.).
Aberrant segments. To understand Turkic long-domain harmony right, we must, however, first of all consider various exceptions from the intrasyllabic homogeneity just discussed. Intrasyllabic disharmony is often found in not fully integrated foreign lexemes. Already in Uigur, there are clearly many cases which a 'harmonizing' transcription would fail to represent, e.g., front syllables with an aberrant onset/coda or peak. The lexeme written şİwık 'stanzá' is a front syllable, since it takes front suffix variants. In view of the notation w (instead of wy), however, it is possible that the vowel represented is not [ö], but an aberrant variant; e.g., Röhrborn reads şlok < Sanskrit śloka (1988, 236). In such cases of internal tension, we mark the syllable for f/b by {'} or {'} according to its choice of harmonic suffix variants (if such a choice is possible), and the aberrant segment by an asterisk * to show that it is realized, phonetically, as less back or front than suggested by the syllable marking. Thus, a [şlok] may be written suprasegmentally as {'şl*ok}. Similarly, modern Turkish kâr 'profit' is a back syllable; however, since {'kar} would yield [qar], we mark the onset to specify its aberration: {'*kar}. Aberration means a phonetically untypical realization of a segment in a syllable marked for front- or backness.¹²

Phonemic treatments. Such cases raise specific problems in taxonomic phonemics. If, in Turkish hal 'situation', a front [I] follows the back /a/, it must be a phoneme of its own, since its distribution is not complementary. According to this view, Ottoman has acquired the "new phonemes" /k', g', l'/ through borrowings (Pierce 1962, Hazai 1978, 56). We have criticized that, with this analysis, a pillar of Turkic phonology, the f/b differentiation of syllables, is given up in favour of a limited anomaly in some stems of foreign origin. Rather than creating contrasts such as /I/: /I'/, which are normally not used distinctively, one might let the vowels bear the slight irregularity and set up three additional front units (occurring in borrowings) with phonetically less typical front realizations: /a, o, u/ (Johanson 1974). A suprasegmental solution in the sense of {'h*al} would be rather similar, and, in other respects, preferable.

Intrasyllabic harmonization. Tendencies towards intrasyllabic harmonization are present in all Turkic languages and may be supposed already for Indo—Iranian lexemes in Uigur, e.g., adaptation of original stretches such

¹² By aberration are meant deviations from an expected f/b quality, reduction, centralization, etc.
as \{'k*V\} to \{'kV\}'. In later Turkic, Persian consonantal f/b features are often reinterpreted as vocalic features (Johanson 1986c). Languages with long Iranian contacts (Azeri, New Uigur, Uzbek) are relatively tolerant of disharmonic chains, whereas others (e.g., Kazakh, Kirgiz, Siberian—Turkic languages) tend strongly to harmonization. It is evident that intrasyllabic tensions often lead to class shift of syllables, e.g. in words of Arabic origin such as mal 'property': [ma:l] = \{'m*a:l\} \ ' [mal] = \{"mal\}.

**Foreign influence.** Disharmony phenomena are often explained as results of foreign influence. Particularly in New Uigur and urban Uzbek, they are attributed to 'Iranization'; some scholars, however, refuse to ascribe them to external factors only (Borovkov 1953, 71, Abdullaev 1980). We cannot go into detail here but would like to point out that, in our view, the strong Iranian phonetic impact upon the dialects mentioned is beyond all doubt. On the other hand, not all deviations from (real or alleged) harmony rules can be attributed to foreign influence. The situation prior to the Iranization may have been considerably less harmonic than assumed by some scholars.

Infringement upon the f/b harmony is often claimed to be connected with *fronitching*. Such cases must be distinguished from the phenomenon of *general fronting*, which affects the very basis of articulation and may move whole segment pairs forwards. As for the dorsal obstruents, some languages, e.g. Tuvan, maintain the old opposition velar vs. deep velar, whereas others, e.g. Turkish, have shifted to palatal vs. velar. Slavic or Iranian influence is thought to have caused fronting of vowels in several languages, and, in some (such as Gagauz, Karaim, Azeri dialects), palatalization of front consonants. In spite of all such shifts, however, the f/b relation mostly remains constant.

**Convergence of signal segments.** Whether due to foreign influence or not, there are many examples of phonetic convergence and even coincidence of members of segment pairs. The f/b differentiation of individual vowels or consonants may be weak or absent.

The most extreme cases are offered by standard New Uigur, where, as is claimed, syllables often simply lack a signal segment. Nevertheless, even such syllables are classified as f/b by means of harmonic suffixes, e.g. [i-šlarza] = \{"*išlarza\}. In syllables with a reduced or zero vowel, the f/b character is equally relevant, e.g., [b'rgä], [brgä] = \{'b*irga\}.

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13 See, e.g., Röhrborn's interesting comments on integrated and nonintegrated Sanskrit words in Uigur (1988).
From a diachronic point of view, it might be asserted that, in such cases, the original assimilatory factor has disappeared. E.g., an allomorph {"ga} still exists, though the preceding syllable is no longer phonetically back. Instead of a phonetically conditioned complementary distribution {"ga} ~ {’ga}, two 'declensions' of morphologically conditioned allomorphs have developed.

Neutral [i]. The situation just mentioned is commonly attributed to the allegedly 'neutral' [i] of New Uigur. According to Pritsak (1963, 32), a back [i] is already absent in East Ancient Turkic. Similarly, Dankoff and Kelly (1982, 61 f.) deny—without really valid arguments—the presence of a distinction /i/ : /i/ in Qarakhanid as represented in the Diwan lu-yat at-turk. But here, too, "there is a clear tendency for a given root to prefer suffixes of one quality or the other". E.g., of the two verb stems transliterated as "il-", one, {"il} 'to stick', takes front suffixes, whereas the other, {"il} 'to come down', takes back suffixes only. These facts do not, however, give us any clue to the real phonetic and phonological status of the high illabial vowels.

There are similar problems in other languages. In Chaghatay, stems going back to Arabic or Persian lexemes with [i] or [i:] in their last syllable often take back suffixes. However, the vowel in such stems is not necessarily 'palatoindifferent' (Eckmann 1959, 145). In principle, it may be back, front, or aberrant; e.g., the dative of dyn 'religion' may be understood as {"di:n\}ga}, {'di:n\}ga}, or {"d*i:n\}ga} (cf. Johanson 1986c, 190 f.). In subsystems of not fully adapted lexemes, there are often syllables lacking clear signal segments; see, e.g., Turkish yar 'friend', with f/b vacillation: {’yar} ~ {"yar}.

Raising and fronting. It is often erroneously claimed that the New Uigur so-called umlaut violates f/b harmony. As a matter of fact, umlaut here means raising, not fronting. Against Polivanov's opinion that umlaut may occur only in words containing [i], Jarring's materials from the dialects of Southern Singkiang prove that it does occur before [i] as well. Eastern Turki words subject to this raising are, according to Jarring's analysis, harmonic with regard to f/b. We here find forms of the structure {"*alimak}, where all vowels are back, and the first one is, in addition, slightly raised (Jarring 1933, 27, 37 f., 68 ff.).

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14 Cf. similar cases in Mongolian, Hungarian, etc., where [i] appears to be harmonically random.

15 See Talipov 1987, 191, 197.
In dialects such as Taranchi and in modern standard New Uigur, however, there is obviously additional fronting, which produces forms commonly rendered as "elinmaq", etc. Since this is a different phenomenon, the claim that [i] < *[i] has changed *[a] of the preceding syllable into [e] (Poppe 1965, 182) appears to be wrong. As a result of the fronting, homonyms such as beli 'his honey' (of bal) and beli 'his loins' (of bāl) have emerged.

It has been much discussed how the "indifferent e" is related to the phonemes /a/ and /ā/ (see, e.g., Talipov 1987, 190 ff.). In our suprasegmental framework, however, [i] and [e] result from phonetic coincidence of illabial vowels, viz., the high and the nonhigh ones, respectively. Their phonological status varies depending on the f/b marking of harmonic syllables, e.g., berilmāq = {'b*ar*ilmak}, berilmāk = {'b*arilmak}, whereby the relations to bar- and bār- remain clear. Cf. Jarring's interesting remark: "Da e auf Grund von Rueckwirkung der Vokale entstanden ist, muss es nach den Gesetzen der Vokalharmonie auch im Tarantschi als sowohl palatal wie guttural bezeichnet werden" (1933, 38). Thus, the allegedly "indifferent i and e" possibly are not phonologically neutral to f/b harmony, but only aberrant in the sense of 'asterisk' segments.

The issue must be investigated thoroughly. However, extreme situations like this certainly demonstrate very clearly that the usual definition of Turkic f/b harmony as "the dependence of vowels of the non-first syllables on the character of the vowel of the first syllable" does not, as Poppe remarks, "cover all the cases" (1965, 183).\footnote{On the other hand, Poppe claims that words of this type [e—i—a] are "the only exception from the rules of palatal harmony" (1965, 183), which cannot possibly be true.}

**Contrast weakness of signal segments.** As previously noted, harmony is said to be strongly infringed upon not only in New Uigur, but also in standard Uzbek (based on urban dialects of the Tashkent—Ferghana type), Azeri dialects, etc. E.g., Uzbek word structure allegedly differs completely from the Turkic norm, f/b harmony having ceased to function here. However, the impact of non-Turkic substrata seems to have been misunderstood. There is hardly any general breakdown of harmony, as certain analyses and graphic practices might suggest. The system is largely intact, the phonological f/b opposition being maintained to a greater extent than is usually assumed and than phonemics can account for.

The problem mostly consists of contrast weakness of individual segments. As already noted, the members of a syllable may bear the impress of
f/b marking in a more or less clearly perceivable way. Phonetic approximation within f/b pairs makes the units less suitable as signal segments.

Thus, some languages, e.g., New Uigur and Khalaj, are said to lack signal segments of the lateral type. This may be regarded as a preserved Proto—Turkic feature or as a result of Iranian influence. In Khalaj, [k] and [q] are hardly distinguishable (Doerfer 1989, 139 f.). In Uzbek, the phonetic distance between front and back vowels is, in general, rather unstable. Differences such as [ɔ] : [ö], e.g., in "ot' herb' : 'ot' pass’, are not very suitable for contrastive purposes.

As for {i}, there is a well-known tendency towards convergence: 1. [i] and [i] sometimes are not distinguished; 2. when kept apart, they are often articulatorily near to each other; 3. there is often f/b vacillation in stems with {i}, e.g. {bič} 'to cut'; 4. class shifts occur among such stems more often than among others, e.g. {iš} 'work' and {til}’tongue’, which are marked for backness in some dialects and for frontness in others.

**Phonemic and diachronic aspects.** The possible phonemic consequences of the contrast weakness mentioned will not be dealt with here. Suffice it to say that the differences are often considered too vague to carry phonemic oppositions, e.g., between the high illabial vowels in languages such as New Uigur, Uzbek, or Khalaj. Remarkably few vowel phonemes are recognized in standard Uzbek.

As for the diachronic dimension, phonemic analyses have hitherto not shed much light on the relevant issues. It seems, e.g., impossible to decide whether phonemes such as /k/ and /q/ are actually recent phenomena, whether an old distinction /i/ : /i/ has been preserved in some languages but repressed to a subphonemic level in others, etc.

One weak point is the absence of explicit arguments for the possible solutions. E.g., Pritsak presents no arguments whatsoever to support his highly interesting claim that there is no opposition /i/ : /i/ in East Ancient Turkic (1963, 32). It is also difficult to see the "positive evidence" allegedly found by Dankoff and Kelly (1982, 61) in their efforts to prove a similar situation for the language of the Diwán. The authors arrive at the remarkable conclusion that, when the neutral /i/ occurs in primary stems with dorsals, the phonemic opposition lies in /k : q/ and /g : γ/, but that, in connection with other vowels, "the gutteral consonants are probably merely allophones of the same phoneme, since the phonemic opposition seems to lie in the vowel"

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17 E.g., "a significant number of roots" in Qarakhanid (Dankoff and Kelly 1982, 61).
(1982, 62). It is not clear what the underlying phonemic concept of this astonishing analysis is, according to which the dialect in question seems to possess more than four phonemic entities within the {k} and {g} area. Technical terms such as "phoneme" and "allophone" need clear definitions to make sense.

**Distinctiveness.** In a suprasegmental framework, the question of distinctiveness can be posed differently. Here, in spite of possibly weak individual contributions, vowels and consonants are taken to cooperate in f/b signalling, whereby even subphonemic elements may acquire signal quality.

Thus, [t] exists as a positional variant almost everywhere, e.g. Uzbek [q̱iʃ] 'winter' vs. [k'ım] 'who'; Uigur [q̱ir] 'field' vs. [ḵir] 'dirt'. On the other hand, even very vague consonantal variants acquire signal quality by cooperation with their vocalic environment. E.g., in Khalaj, the undifferentiated /k/ is said to possess one positional variant, "pronounced (very slightly) more to the back", and one palatalized variant [ḵ] (Doerfer 1971, 140); a similar situation holds for /g/. In Katanov's Eastern Turkic texts, edited by Menges (1933—1936), backness is signalled by [t] even in forms containing raised and fronted vowels such as elip 'having taken' = {"*al*ip}, etc.

In such cases, "natural assimilation" reinforces the signal effect. It is, therefore, difficult to see that distinctions such as [k] : [g] in Khalaj should be justified "neither from the phonetic nor from the phonologic viewpoint" (Doerfer 1971, 140). If [q̱] differs perceivably from [ḵ], a distinctively used phonetic contrast is present, which is crucial in phonology. But the distinctiveness clearly belongs to the whole stretch rather than to any of its segments.

**Functional load.** Segments take part in f/b signalling in different ways, according to their specific phonetic qualities. At the same time, their individual distinctive force seems to depend, to a certain degree, on their functional load. E.g., {"k"} : {'k} is a contrast with a heavy load, which makes differentiation remunerative. It is even assumed that the many k-signs of the runic script are due to a high frequency of [k]-sounds (Róna—Tas 1987, 12). Accordingly, a clear segmental contrast [q̱] : [ḵ] is maintained relatively often in modern Turkic languages, even in strongly 'Iranicized' dialects as urban Uzbek. On the other hand, the difference {"i"} : {'i} seems to be employed relatively infrequently in the Turkic lexicon. Accordingly, the segmental contrast [i] : [i] is often weak; the correspondent graphic distinction is less profitable than many others.

E.g., the functional load of {"a"} : {'a} appears to be considerably heavier. Even in Uzbek, where phonemic f/b differences between vowels are
said to be neutralized, there is a clear differentiation, at least in the first syllable: \{'a\} is realized as [æ] or [a], and \{"a\} as [å] or [a]. Phonemically, the slightly labialized [å] (in [årqa] 'back' etc.) should be analysed as an allophone of /al/ (Johanson 1986c, 199). It functions as a clear signal segment of backness in certain rewarding positions.

Polivanov (1922, 17 f.) ascribed the emergence of [å] to external factors, which seems to be correct. The nature of this influence is, however, often misunderstood. According to Abdullaev (1980, 7), Polivanov’s view is not supported by distributional facts, since the spread of [å] in Uzbek does not coincide with the spread of Tajik [å]. This functional disagreement does not exclude Iranian phonetic influence. In this case, a certain phonetic type existing in the area has obviously been adopted to serve genuinely Turkic phonological purposes.\(^{18}\)

**Disharmony in polysyllabic primary stems.** In most older and modern Turkic languages, intersyllabic disharmony is, as is well known, frequent within polysyllabic primary stems of foreign origin. Intersyllabic harmonizing is, however, often considered to be the first measure taken when a foreign lexeme is phonologically adapted. This incorrect view, based on false ideas of Turkic word structure, will be discussed in a forthcoming contribution.

Disharmony cannot even be excluded for Turkic polysyllabic primary stems. In New Uigur, there is a tendency towards fronting of the last syllable. A similar fronting of \{"a\}, originally in final open syllables, is one of the peculiarities of Uzbek, e.g. [qårə] 'black'.

There may be disharmonic cases of various kinds in older languages as well. As for Orkhon Turkic, a front syllable sign of the the runic script may occur in a basically back word, particularly in the immediate vicinity of an expected high illabial vowel. Thus, sequences such as \(k’n’ Nottingham{\textquoteright}s \) 'your ruler (acc.)' and \(b’wl’my’\) 'not finding' might well be interpreted as \{"kani\}'in\} = [qanï’\text{\textipa{\textquotesingle}}\text{\textipa{\textquotesingle}}\\text{\textipa{\textquotesingle}}\in\} and \{"bulma’ym\} = [bulmayin] about the possible presence of a 'neutral' vowel in the sense of \{"\text{\textipa{\textquotesingle}}\text{\textipa{\textquotesingle}}\}, v. infra.

**Suffixal disharmony due to intrasyllabic tension.** A very different type of 'exceptions' from harmony rules regards the selection of suffix variants attached to loanwords. This is normally only a question of intrasyllabic tensions between peak and coda in the preceding syllable. A case such as Turkish halde = \{"h*\text{\textipa{\textquotesingle}}\\text{\textipa{\textquotesingle}}\\text{\textipa{\textquotesingle}}\}\text{\textipa{\textquotesingle}}\text{\textipa{\textquotesingle}}\} ‘aldalata is 'disharmonic' only if the phonemic quality of the stem vowel is taken to govern harmony.

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\(^{18}\) A similar case is the glottalization in Saian Turkic; see Johanson 1986b.
Neutralization. In Turkic languages of all periods there are other numerous examples of deviations from the 'vowel harmony' rules as they are usually stated. To understand these phenomena, it is first necessary to consider the general situation holding in nonfirst syllables. The first syllable of the Turkic word is commonly said to be the position of maximal differentiation with respect to the features [± high], [± front], [± round]. If nonfirst syllables assimilate progressively to the preceding ones with respect to one or more of these features, this means systematic occurrence restrictions. A 'harmony' is a product of neutralization of the affected feature. In f/b harmony, the functional f/b opposition is suspended; e.g., the choice of an allomorph [lik] instead of [liq] may violate the 'realization norm' but has no functional effects.

However, neutralization is obviously prior to harmony and a prerequisite for it. Turkic linguistic history knows many examples of gradual development of suffix syllables and their segments from a 'relevance stage' (where the distinction in question is valid) to various stages of neutralization. The latter may extend from rather disordered stages to more regularized ones; they may or may not include harmony; and, as we have seen, harmony does not necessarily or exclusively consist of vowel harmony. As far as the realization of vowel segments in suffixes is concerned, there are several possibilities, once the functional f/b opposition is suspended.

Nonharmonic suffixes. First of all, the suffix may remain nonharmonic. Such suffixes are present at all stages of development. Old nonharmonic suffixes are, e.g., -(s)i (possessive), -miš (postterminal), and -či (nomen actoris). As is well known, in runic notations of words with back stems, a front sign may occur to indicate that the suffix attached contains a nonharmonized [i], e.g., {"a’ti} 'his horse'. Even in languages of a highly developed suffixal harmony, its application can be blocked by grammatical boundaries, so that mixed harmony forms arise, e.g., Turkish geli#yor 'comes' {‘gali''yor}.

It is important to realize that we have to reckon with such cases in older languages and that they are not always signs of foreign influence. Sometimes suffixal harmony is claimed to have 'ceased to function', though it might not even have started yet in the dialect in question. E.g., allegedly nonharmonic Chaghatay suffixes such as "-čä" (Abdullaev 1980, 17 f.) are, if they are read correctly, not necessarily innovations,\(^\text{19}\) examples of beginning infringement.

\(^{19}\) Cf. the nonharmonic front -čä in Tuvan. It is, however, open to doubt whether the Arabic letter ha really stands for [ä] in such words as, e.g., b’rghyh 'to all' (Babur—nâmâ, fol. 101a; Abdullaev: "barčägä").
upon the harmony. This is also partly true of Chuvash f/b harmony with its "numerous exceptions which concern certain suffixes" (Poppe 1965, 183).

**Disharmonization.** In some cases, however, disharmonization of suffixes has probably taken place: one of several possible harmonic forms has been chosen to represent the suffix. This might be the case in Uzbek, where suffixal harmony seems to have been disturbed by fronting in many suffixes (-da, -sa, etc.), and by backing in some others (-råq, -måq). The emergence of nonharmonic suffixes in Azeri dialects is also one of the phonotactic perturbations which may partly be due to Iranian influence, e.g., *bilmax* 'to know' = {'bil"mak} (Johanson 1988).

**Phonetically neutral vowels.** At the so-called 'indifference stage', which often precedes stages of vowel harmony (Johanson 1979a, 70), certain preliminary symptoms may appear: 1. promiscuous use of f/b suffix variants, and 2. 'phonetic neutralizations', i.e., occurrence of vowel variants that tend to a phonetically central position and are, as such, neither front nor back.

Such vowel variants often occur in nonstandardized dialects (e.g. of Azeri), and evidently also in various older periods of Turkic languages (Doefer 1971, Johanson 1979a and 1989). There is no reason to consider them products of foreign influence. The dialectologist should record them faithfully, not trying to press them into the mould of a standard scheme of peripheral vowels. Reconstruction of earlier linguistic stages is impossible without recognition of the reality of living languages. There is no justification for the widespread opinion that, "à date historique", only [æ, a, i, i, ue, u] can occur in non-first Turkic syllables (Bazin 1959, 13). Even modern standard languages of a regularized vowel harmony show phonetically central vowels here. E.g., in Turkish, vowels of the first syllable fall more or less on the periphery of the cardinal vowel diagram, whereas those of nonfirst syllables are often perceptibly centralized (Hill 1966, 203).

**Neutral vowels in marked syllables.** Phonetically 'neutral' vowels of the kind discussed may seem disharmonic and still be members—as aberrant 'asterisk' segments—of syllables phonologically marked for f/b, e.g., Middle Ottoman [käs*ilmiš] 'cut' = {'käs*ilmiš}. This stage is thus, in principle, a

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20 Johanson 1979a, 101. Examples (from a transcriptional text) with labial vowels are *doldår* 'fill' = {*dold*ur}; *kildük* 'we have made' = {*kild*uk} (Hazai 1973, 68, 152). Cf. the frequent Chaghatay forms of the type *bwl*dwk 'we became', where the letter *kaf* seems to denote the nonharmonicity of the suffix, {*bol'duk*}, or, more likely, to indicate the aberration of the preceding vowel: {*bol'duk*}. (For the delabialization of this suffix, see Johanson 1979a, 81 f.)
harmonic one. As a matter of fact, the suprasegmental description allows for a better understanding of several crucial "neutralization" phenomena. One example: In an Armeno—Ottoman transcriptional text edited by Sanjian and Tietze (1981), front and back vowels seem to alternate in many words, e.g. "dinimizden" (in the editors' transcription). Obviously, the Armenian letter rendered as i is in fact a schwa (Johanson 1984). Thus, in what Tietze takes to illustrate "the principle of lateral shift" (1981, 54 f.) we rather recognize the use of phonetically centralized vowels as aberrant segments in a polysyllabic harmonic stretch of unequivocally front character: [dinamazdan] = \{din*i*m*izdan\}. Here, in spite of seemingly nonharmonic vowel shapes, the syllabic frontness opposition functions. It is possible that Orkhon Turkic notations such as k'nh\textgamma n and b'wilmy\textgamma n can be understood in the same sense, i.e., not as \{kani\textgamma in\} and \{bulma\textgamma in\}, but as \{kanin\textgamma in\} and \{bulmay\textgamma in\}, where the last vowel is not [i], but rather a neutral \{*i*\} = [i], i.e., [qaninan] and [bulmayan].

Generalizations. These very brief remarks on a rather complex matter are nothing more than a preliminary attempt at outlining a hypothesis for which a more explicit argumentation is certainly necessary. Some of the points touched upon presuppose familiarity with ideas expressed in our previous contributions to the description of Turkic sound harmony (see Bibliography). A more detailed account of the problems connected with the analysis of f/b oppositions in Turkic is in preparation. Our aim is to show that a nonsegmental representation of the kind suggested here obviously captures more interesting generalizations about Turkic phonology than would be possible by phonemic analyses of the individual languages.

References


