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RECONSTRUCTING THE OBSTRUENTS OF PROTO-GERMANIC

HARRY PERRIDON

It is generally assumed that PIE had at least three series of stops, which traditionally (e.g. Meillet 1908) are identified as plain (voiceless) stops (p , t , k , k^w), voiced stops (b , d , g , g^w) and voiced breathed stops (bh , dh , gh , g^wh). There is little evidence for a fourth series of stops, the aspirated voiceless stops p^h , t^h , k^h , k^wh , but this evidence seems sufficient for e.g. Szemerényi (1989) to reconstruct a system of stops that is identical to the ones found in a number of North-Indian languages, such as Hindi, Marathi and Nepali. In this way one avoids reconstructing a consonant system for PIE that is not found in any existing language.

Both types of reconstruction face a number of other problems, as pointed out by Gamkrelidze & Ivanov, Hopper and other 'glottalicists'. Especially the (near) absence of a labial stop in the second series in the reconstructed proto-language is worrying. Languages that have voiced (or lax) stops may lack g (e.g. Dutch) or even both g and d (e.g. Tzotzil), but absence of b is rare.¹ In the voiceless series, on the other hand, the labial is missing in a large number of languages, e.g. in Arabic, Thai, Kuria (Bantu), Yoruba, Old High German etc. Voiced stops (both plain voiced stops and implosives) are apparently easier to pronounce in the front than in the back of the mouth, with voiceless stops (plain and aspirated stops, as well as ejectives) it seems to be the other way round.

The absence of a labial stop in the second series thus suggests that these stops were voiceless in PIE. Since roots with two stops of the second series do not occur in PIE (t^2ek^2 -) it is not very likely that they were plain voiceless stops: tek - is a sequence "which only a very strange tongue would ostracize" (Collinge 1985: 261). One could reconstruct aspirated stops, but I think it is more likely that they were ejectives.

The stops of the third series are traditionally reconstructed as voiced breathed stops ('*mediæ aspiratæ*'), but languages that have such stops but lack their voiceless counterparts (the '*tenuis aspiratæ*') are hard to come by. It has therefore been suggested that the voiced breathed obstruents are an innovation within the Indian subbranch of IE, and hence were no

¹ In Standard Finnish d is the only voiced stop, b and g occur only in loans. In most dialects, however, this d is replaced by r , l or j .

part of the PIE consonant inventory. The PIE stops of this series have been reconstructed as voiceless aspirated stops, voiced stops with optional breathing, plain voiced stops etc. I will take no stand in this debate, but will simply assume that in the branch of IE that was to evolve into Proto-Germanic they had either remained or become plain voiced stops. I reconstruct thus the following system of stops for this stage (which I will call 'Pre-Germanic'):

(1)	1. plain	2. ejective	3. voiced
	p	(p')	b
	t	t'	d
	k	k'	g

At some point in time the plain stops became aspirated in initial position, and medially if the accent fell on the preceding vowel. By remaining unaspirated the voiceless stops in other positions merged with the voiced stops. In this way the opposition between voiceless and voiced stops was replaced by an opposition between aspirated (tense) and unaspirated (lax) stops. It is quite possible, however, that the opposition between the two series was articulated in a double way, i.e. by both voice and aspiration. Later the aspirated stops (p^h , t^h , k^h) became fricatives (f , $þ$, x), and the ejectives (t' , k' , and possibly p' in loanwords) turned into plain stops (p , t , k). The spirantisation of the lax stops in medial and final position belongs to the history of the subbranches of Germanic: in North Germanic lax stops (b , d , g) and fricatives (β , δ , γ) are distributed in much the same way as they are in modern Spanish, in Old High German the lax stops remained stops, and in the other West Germanic languages b , d and g spirantised to various degrees.

These changes can be illustrated by means of a reconstruction of a part of the history of the Old Norse verb forms *binda* 'to bind', *bundin-* 'bound', *finna* 'we find' and *fundin-* 'found.'

Pre-Germanic	*bénda-nan	*bundána-	*pénta-nan	*puntána-
aspiration	*bénda-nan	*bundána-	*p ^h ént ^h a-nan	*p ^h untána-
+ reanalysis				*p ^h undána-
spirantisation	*bénda-nan	*bundána-	*fénþa-nan	*fundána-
later changes	binda	bundin-	*finþa	fundin-
n + þ > nn			finna	

In a number of papers Kortlandt (1988a, b; 2000; 2003) has suggested that the ejectives that both he and I reconstruct for Proto-Indo-European changed into preglottalised stops in Proto-Germanic before they became plain voiceless stops in the individual daughter languages. Preglottalisation is still to be found in British English as the so-called ‘glottal reinforcement’ of *p*, *t*, *c* and *k*, and in the dialects of West Jutland (Denmark) as the ‘vestjysk stød,’ i.e. the preglottalisation of an originally medial voiceless stop. Kortlandt sees, moreover, a connection between these cases of retention of what he believes was the original situation in Common Germanic, and the following phenomena within the Germanic language family: (a) preaspiration of voiceless stops after short vowels/diphthongs in Icelandic and Faeroese; (b) preaspiration of fortis stops in a large number of Swedish and Norwegian dialects; (c) gemination of *p*, *t* and *k* after short stressed non-low vowels in some Swedish and Norwegian dialects, e.g.: Sw. *droppe* ‘drop’ ON *dropi*; (d) gemination of *k* after a short vowel and before *j* or *w* in Old Norse, e.g. *bekkr* < **bakjar* ‘brook’; (e) gemination of *p*, *t*, *k* before *l* and *r* in West Germanic; (f) assimilation of *mp*, *nt*, *ŋk* to *pp*, *tt*, *kk* in large parts of Scandinavia, e.g. Sw/Dan/Norw *drikk!* ‘drink!; (g) the change of *p*, *t*, *k* to *pf/ff*, *ts/ss*, *kx/xx* in Old High German.

It is in my opinion unlikely that ejectives ever turn into preglottalised voiceless stops in word-initial position. It is even more unlikely that these stops would have lost their buccal occlusion in OHG, thus turning into preglottalised fricatives, which later oralised their glottal constriction. Oralisation of a glottal constriction (‘klusilspring’) only occurs after a stressed high (closed or half-closed) vowel, which in the Danish dialects in which this phenomenon is attested, must have stød, e.g. *huks* < *hu’s*² ‘house’ or *tik* < *ti’* (< *ti’ð*) ‘time.’ There is, moreover, no need to assume such a complicated and implausible order of events in the early history of Old High German, since the development of affricates out of voiceless fortis stops, be they aspirated or not, is rather straightforward, and is at least in the case of *t* well attested in the Germanic languages, in Danish for instance every fortis *t* is affricated: *tʰ*, and the same holds for the dialects of the province of Groningen in the Netherlands.

It is, on the other hand, not entirely impossible that the ejectives developed preglottalised allophones in medial and final position, which may have survived the later deglottalisation of the ejectives in other positions. In the remainder of this paper I will look at the available evidence for this

² I use a question mark ? (in superscript) for the *v*-stød, and a quotation mark ‘ for the common Danish stød. In accordance with Danish practice the unaspirated lax stops are here transcribed as *b*, *d*, *g*, and their aspirated tense counterparts as *p*, *t*, *k*.

hypothesis, with special emphasis on the cases of preglottalisation and preaspiration.

Glottal reinforcement in British English

In Standard BrE (RP) a glottal stop or glottal constriction is often inserted before *c*, and before *p*, *t*, *k* followed by a pause or another consonant. In other dialects, such as Tyneside English and Central Scots, glottalisation is more pervasive: "it is found in voiceless stops and affricates following a primarily stressed vowel both before a following obstruent and intervocally. [...] Glottalisation applies irrespective of word and morpheme boundaries" (Docherty *et al.* 1997: 282). In contrast with RP glottal or glottalised stops "do not occur in turn-final and other pre-pausal contexts in Tyneside" (Docherty *et al.* 1997: 307), which makes the distribution of the glottalised stops in this dialect remarkably similar to that of the vestjysk stød (see below). In British English the glottalised variants are only rarely produced with a glottal stop articulation. In their study of glottal and glottalised variants of /t/ in Newcastle upon Tyne Docherty and Foulkes (1999) found that 70% of all glottal variants they examined (N = 549) were fully voiced, 27% partially voiced, and only 3% percent voiceless. They conclude that: "the most typical laryngeal characteristic associated with these sounds (i.e. the glottal variants of BrE, HP) is an interval of laryngealised voice quality."

Kortlandt (2003) assumes that BrE glottalisation is old, and recessive. Docherty *et al.* (1997) think that it is expansive in some varieties of RP, but recessive in Tyneside English. But the final answer to the question of the age of BrE glottalisation comes from Trudgill (1999), who analysed the phonology of some speakers of New Zealand English, who were born between 1850 and 1890, and were recorded in the late 1940s. Because of what Trudgill calls a "colonial lag" in the development of the English language in New Zealand in the first period of colonisation, their speech is representative of an earlier generation of BrE speakers, i.e. of those born between 1820 and 1850. He found no traces of glottal reinforcement or glottal replacement in the recordings, and concludes therefore that "preglottalization in Britain, too, is a recent and probably late nineteenth-century phenomenon" (Trudgill 1999: 237).

The vestjysk stød

In the dialects of West Jutland and North Funen in Denmark stops are preceded by a glottal stop when "these stand in an original medial position, following a voiced sound in a stressed syllable" (Ringgaard 1960:

195). Ringgaard describes the *v-stød* as a full glottal stop, which differs from the common Danish *stød* both in the way it is articulated and in the auditory impression it makes. This latter *stød*, which is used in approximately the same way in the dialects in question as in Standard Danish, is described by Fischer-Jørgensen (1989) as creaky voice. Pictures from an X-ray film of the vocal cords during the production of words with *v-stød* in Ringgaard's dissertation show clearly that "the *v-stød* is articulated by a contraction not only of the true vocal cords but also of the false ones, so energetical that Sinus Morgagni is completely obliterated, and of so long duration that the occlusion of the vocal cords is found all through the following plosive." (Ringgaard 1960: 198). It is remarkable, though, that this strong glottal stop gives Ringgaard the same auditory impression as the preglottalised plosives of Northern English, which Docherty and Foulkes (1999) have demonstrated are hardly ever pronounced as voiceless stops. The *v-stød* is found after a stressed vowel, or stressed vowel plus sonorant (*r, l, m, n, ŋ, w, j*) or lax voiced fricative (*β, δ, γ*), before a stop in originally medial position. As its Tyneside English counterpart the *v-stød* applies irrespective of word and morpheme boundaries, e.g., *læ²dhi²əd̥* 'lightness', *vär²gste* (Dan. *værk-sted*) 'workshop', *hjæl²bmə* 'help me' with *v-stød*, but *læt* 'light, easy', *värk* 'work' and *hjælp* 'help!' without *v-stød*, but with aspirated final stops.

In the dialects of West-Jutland final short vowels were lost in the course of the thirteenth century: in the oldest texts that have come down to us from this region, such as the Stockholm manuscript C37 of *Jyske Lov* (the Law of Jutland) from around 1280, there are already numerous examples of apocopated forms. This loss of final unaccented vowels gave rise to a large number of minimal pairs in the modern dialects that only differ from one another in the laryngeal features of the final stop. In apocopated words the stop is unaspirated and preceded by the *v-stød*, in non-apocopated words the final stop is aspirated, e.g. *hen²d* 'to fetch-inf' (Dan. *hente*) *hent* 'fetch!-imp' (Dan. *hent*), *skar²b* 'sharp-pl' (Dan. *skarpe*), *skarp* 'sharp-sg' (Dan. *skarp*), *ha²d* 'hats' (Dan. *hatte*), *hat* 'hat.' The phonemicization of the allophonic variation between originally medial and final stops provides us according to Ringgaard (1960: 107) with a terminus ante quem for the origin of the *v-stød*, but this conclusion is not inevitable, as it is possible that the two types of allophones/phonemes at first only differed in the absence or presence of aspiration. At a later stage the opposition between the two kinds of stop would then have been made more salient by the glottal reinforcement of the unaspirated stop. There are some indications that this was indeed the course of events. *V-stød* is found in words with a sequence sonorant + stop, in which the sonorant derives from a stop or

voiceless fricative, e.g.: *kjøv²d* 'bought' with $v < b < p$, cf. Dan. *købte*, Norw. *kjøpte*, *bruw²d* 'used' with $w < \gamma < g < k$, cf. Dan. *brugte*, Norw. *brukte*. Since v-stød does not occur after a voiceless fricative it must be of a more recent date in these words than the weakening of postvocalic stops and fricatives in vestjysk and the other Danish dialects. It is not absolutely clear when the process of obstruent lenition started, there are some sporadic occurrences of lenited stops ($b, d, th, g(h) < p, t, k$) in texts that were composed well before 1300, but have come down to us in more recent manuscripts, such as Saxo Grammaticus' *Gesta Danorum* (written around 1200), which has weakening in some latinized Danish names, e.g. *Krage* < ON *Kraki*, or *Valdemars sjællandske lov* (Valdemar's law for Zealand), which has weakened forms like *uthæn* 'without, outside' and *withæ* 'know'. But in an overwhelming majority of cases we find p, t, k instead of expected $b, d, g(h)$ in the manuscripts from the 14th century. Since these very same manuscripts have large numbers of apocopated forms, it seems reasonable to assume that the lenition of postvocalic stops was a later change in the dialects of Jutland than the apocope of unstressed final vowels. If this assumption is correct then it follows that the preglottalization of the stops after a sonorant (or lax voiced fricative) in a word like *kjøv²d* 'bought' must be a later development of an earlier pronunciation that made the final stops in apocopated words different from those in non-apocopated words. Another indication that preglottalization is an innovation in the dialects of West Jutland and North Funen is that it seems to have been (and to some extent still is, see Ringgaard 1960: 10-11) completely regular: all non-aspirated stops after a stressed vowel (or vowel + sonorant/voiced lax fricative) receive v-stød, even originally lax ones, as e.g. in æ^2g 'egg' (Dan. *æg*, Swe *ägg*), ne^2b 'beak' (Dan *næb*, Swe *näbb*).

The way in which the Old Scandinavian stops developed in the West-Danish dialects can be summarised as follows. After a stressed vowel the singleton fortis stops p, t, k became lenis stops (b, d, g), and later voiced lenis fricatives (β, δ, γ) or glides (w, j), or disappeared altogether; after a sonorant the fortis stops p, t, k were lenited to b, d, g in medial position, but did not change in final position; the geminate fortis stops pp, tt, kk were reduced to b, d, g in medial position, but to p, t, k in final position; the lenis stops b, d, g were weakened to β, δ, γ in both medial and final position, medially the geminate lenis stops bb, dd, gg were weakened to β, δ, γ as well, but they remained stops (b, d, g) wordfinally. These changes led to the following distribution of the fortis and lenis stops: in medial position there is opposition between lenis stops and lenis fricatives/glides, in final position between fortis and lenis stops, both in apocopated and non-apocopated words. At some point in time all (unaspirated) lenis stops

were strengthened by means of the *v-stød* if they followed a stressed vowel or vowel + sonorant. In the inflectional system of the dialects in question we thus find alternation between β , δ , γ and ${}^?b$, ${}^?d$, ${}^?g$ in words which originally had a geminate lenis stop, and between ${}^?b$, ${}^?d$, ${}^?g$ and p , t , k in words with an originally geminate fortis stop:

	medial		final		
gg	<i>vεγə</i>	'wall-pl'	<i>vε{}^?g</i>	'wall-sg'	(Dan. <i>vægge</i> , <i>væg</i>)
	<i>byymark</i>	'barley field'	<i>by{}^?g</i>	'barley'	(Dan. <i>bygmark</i> , <i>byg</i>)
kk	<i>træ{}^?gə</i>	'pull-pres'	<i>træk</i>	'pull!-imp'	(Dan. <i>trækker</i> , <i>træk!</i>)

Preaspiration in North Germanic

Preaspirated stops are found all over Scandinavia, with the exception of Denmark. In Icelandic, Faroese and some Swedish and Norwegian dialects (Jæren and Gudbrandsdalen in Norway, Gräsö, Härjedalen and Arjeplog in Sweden, and some dialects of the archipelago of Åland and Åboland in Finland) preaspiration is normative³, i.e. part of the phonological system of the language/dialect. In other Norwegian and Swedish dialects preaspiration is frequent, especially in the speech of women, but optional from a phonological point of view.

In all these dialects there are two series of stops, which I will refer to as fortis and lenis. Fortis stops are always voiceless, and aspirated in initial position, lenis stops are voiceless and unaspirated in Icelandic, Faroese, and the dialects of Jæren and Gräsö, but usually fully voiced in all positions in the other dialects (for details see Helgason 2002: 105-212). Geminate fortis and lenis stops only occur after short vowels, after long vowels there is opposition between voiced fricatives and unaspirated or slightly aspirated stops in Faroese and the southern dialect of Icelandic, and between voiced fricatives and aspirated stops in the northern dialect of Icelandic. In the Swedish and Norwegian dialects the voiced fricatives δ and γ of Viking Age Scandinavian have become voiced stops, which however in spontaneous speech often turn up as approximants or voiced fricatives. In careful speech there is a four-way contrast between postvocalic stops in Swedish and Norwegian: they can be either long or short, and either voiced or voiceless. This is illustrated by the following examples from Standard Swedish:⁴

³ The terms normative and non-normative preaspiration stem from Helgason 2002: 21-23

⁴ *vit* 'white'; *vitt* 'white n-sg' or 'wide n-sg'; *vid* 'wide'; *vidd* 'extent'; *rätas* 'to be straightened'; *rättas* 'to be corrected'; *rüdas* 'to fear'; *rüddas* 'to be saved'.

	voiceless	voiced	voiceless	voiced
short	vit [vi:t]	vid [vi:d]	rätas [rɛ:tas]	rädas [rɛ:das]
long	vitt [vit:]	vidd [vid:]	rättas [rɛ:t:as]	räddas [rɛ:d:as]

The main function of non-normative preaspiration seems to be that it enhances the impression that the following stop is voiceless (cf. van Dommelen 1998). Geminate fortis stops are in general⁵ more often and more intensively preaspirated than their singleton counterparts. In geminate lenis stops, which usually are voiced intervocally, there is a tendency for voicing to die out with increased stop duration (Helgason 2002: 142). By preaspirating the fortis stops speakers can counterbalance the loss of contrastiveness between the two series of geminates. Since singleton lenis stops are usually fully voiced, there is in principle already enough contrast between voiceless fortis and voiced lenis stops, and hence less need to preaspirate the fortis stops. In the dialect of Gräsö off the coast of Central Sweden both singleton and geminate lenis stops are partially or completely voiceless. This dialect preaspirates singleton fortis stops in medial position, thus creating/restoring a contrast with the unaspirated lenis ones. Other dialects have fully voiced lenis stops, but still allow a fortis stop to be preaspirated in this position.

In Icelandic both fortis and lenis stops are voiceless. In word-initial position fortis stops and affricates are aspirated (p^h , t^h , c^h , k^h), lenis stops and affricates unaspirated (p , t , c , k). Corresponding to the four-way contrast between stops in Swedish and Norwegian we find the following oppositions in Icelandic intervocally:

	lenis	fortis
short	β , δ , γ	p , t , k (Southern); p^h , t^h , k^h (Northern)
long	pp , tt , kk	hp , ht , hk

After nasals and l there is opposition between aspirated (fortis) and unaspirated (lenis) stops in the northern dialect; in the southern dialect there are voiceless nasals and laterals in those cases where the northern dialect has aspirated stops. The contrast between fortis and lenis stops has been replaced by a contrast in voice of the nasal/lateral preceding the stop. In

⁵ There seem to be no rules without exceptions. The odd man out here is the dialect of Arjeplog in Lappland, Sweden, in which preaspiration is twice as long before singleton stops as before geminates. It is possible that this deviant distribution is due to Saami influence (cf. Helgason 2002: 79; Wretling *et al.* 2002)

both dialects there is opposition between voiced and voiceless *r* before a stop. Although the geographic distribution of preaspiration and voiceless sonorants and nasals is different, it can be argued that preaspiration and voiceless sonorants are two sides of the same coin: in both cases the stop is preceded by a period of voicelessness.

Before nasals (mainly *n*) and *l* the fortis stops seem to have geminated, which is probably caused by the “prestopping” character of *n* and *l* in Icelandic (as well as in some West-Norwegian dialects). The more or less implicit (pre-)stop present in *n*, *m* and *l* “surfaces” in the clusters *sn*, *rn*, *nn*, *sm*, *sl*, *rl*, *ll*, which are pronounced as: *stn*, *rtn*, *tn*, *spm*, *stl*, *rtl*, *tl*, e.g.: *slá* ‘to hit’ [stlau:], *snúra* ‘line’ [stnu:ra], *smár* ‘small’ [spmau:r], *varna* ‘to warn’ [vartna], *varla* ‘hardly’ [vartla]⁶. It lengthens the preceding fortis stop, and makes stops (*p*, *k*) out of the voiced fricatives *β* and *γ*, e.g.: *nefna* ‘to mention’ [nɛpna], *sigla* ‘to sail’ [sikla]. The lengthened fortis stops are pronounced as preaspirated singleton stops, e.g.: *epli* ‘apple’ [ɛhpli], *vakna* ‘to wake up’ [vahkna], *ætla* ‘to think’ [aihþla].

In view of the geographical distribution of preaspiration in Scandinavia it seems likely that it dates back to at least the period before the break-up of the parent language (Proto-Norse) into a multitude of dialects in the post-Viking era. Kortlandt (1988a-b, 2000, 2003) assumes that the preaspirated stops found in North Germanic are the reflexes of preglottalised stops in Proto-Germanic, and hence, that the history of preaspiration is the history of its loss in most of the contexts in which it once occurred. This theory faces a number of difficulties. It does not explain why fortis stops are (post)aspirated in word-initial position in almost all North-Germanic dialects, and in medial position in the northern dialect of Icelandic (‘harðmæli’), the dialects of Bjerkreim and Dalane in Norway and Western Åland in Finland. Moreover, it does not account either for the fact that in Central Swedish not only voiceless stops but also voiceless fricatives tend to be preaspirated (Helgason 2002: 89). It should, finally, be borne in mind that the preaspirated stops of North Germanic (or the preglottalised stops of West-Jutlandic) in a large number of cases do not reflect the second series of PIE stops, but rather the first or the third series, e.g. in the past participles and past tenses of weak verbs, in words containing the reflexes of the PIE clusters *kt* and *pt*, and in word-forms that underwent final devoicing, e.g. Ic. *batt* < *bant* < *band*. Preaspiration must hence be secondary in these forms.

⁶ These examples stem from Gíslason & Þráinsson 1993: 76-77 and 177-179.

Helgason (2002) suggests that preaspiration was distributed in Old-Scandinavian in roughly the same way as it is in present-day Swedish and Norwegian: "Thus, preaspiration was nonnormative, i.e. the timing of voice offset relative to stop closure in the production of fortis stops was—and still is in most of Scandinavia—relatively free. The time at which this relative freedom in voice offset became established is unknown, but in the scenario proposed here one must assume that it was already the dominant pattern in PN (= Proto-Norse, HP)" (Helgason 2002: 239). After the voiced lenis stops were devoiced in Icelandic, in some dialects of Faroese, in the dialects of Gräsö in Sweden and Jæren in Norway preaspiration was no longer optional in these dialects as it had become the only means by which fortis and lenis stops were kept apart in medial position. In other dialects, such as those in Gudbrandsdalen in Norway and Härjedalen and Sweden, preaspiration became obligatory as well, although the lenis stops remained voiced. In these dialects, which like Standard (Central) Swedish, have a fourfold opposition between voiced and voiceless singleton and geminate stops in medial position, the contrast between fortis and lenis stops is doubly expressed: by voice and (post)aspiration in wordinitial position, and by voice and preaspiration in medial position.

Although Helgason's theory accounts in a principled way for the present distribution of pre- and postaspiration in North Germanic, I do not think it can be the final word in this matter. Preaspirated obstruents are, as Silverman (2003) has shown, diachronically unstable for lack of phonetic salience. It would therefore be rather surprising if such an unstable feature would have survived for at least a thousand years in a large number of dialects that had little or no contact with one another. It would be even harder to explain why preaspiration is becoming more, instead of less, frequent in the speech of younger speakers of regional varieties of Standard Swedish (cf. Tronnier 2002). A possible solution of this problem lies in the assumption that the daughter languages inherited the preconditions for the emergence of non-normative preaspiration from the parent language Proto-Norse, rather than preaspiration as such. As long as these preconditions are present preaspiration may, but need not, arise. One of the preconditions is, I think, the presence in the language of a double contrast between its stops: there has to be an opposition between tense and lax stops, and between long (geminate) and short (singleton) stops. It will further the emergence of preaspiration if the opposition between the fortis and lenis stops is partly expressed by means of postaspiration, but this does not appear to be a necessary condition. Some confirmation of this hypothesis is provided by the discovery and analysis of preaspiration in Tuscan Italian by Stevens & Hajek (2004a and b), a language whose

fortis stops certainly do not reflect the PIE stops of the second (glottalised) series. In the Sienese variety of Italian there is opposition between voiceless and voiced stops, and intervocalically between long and short stops, as in the Nordic languages. As in other Tuscan dialects the singleton fortis stops are optionally spirantised intervocalically, e.g. *la hasa* < *la casa* 'the house', *trovaθo* < *trovato* 'found' (this is the so-called *gorgia Toscana*).⁷ According to Stevens & Hajek (2004a) preaspiration is "the result of an articulatory gesture intended to maximise the perception of geminate consonants in natural speech, with minimal supralaryngeal articulatory effort. In this way, the perceptual effect of consonant duration within the /VC:/ sequence is preserved. It is also likely, but as a secondary effect, that preaspiration serves to enhance the voicelessness of /pp tt kk/, by blocking voicing in and around the closure." Stevens and Hajek did not only find preaspiration in Sienese Italian, but also voiceless sonorants before a fortis stop (Stevens & Hajek 2004c), which corroborates the hypothesis that the two phenomena are intimately connected.

If the assumption is correct that it was the preconditions for the emergence of preaspiration rather than preaspiration itself that the Nordic languages inherited from Proto-Norse, we need no longer look for a common origin for all the cases of preaspiration in these languages. Preaspiration may have emerged, and possibly have disappeared again, in different areas at different points in time. It may be rather old in Icelandic, where its long duration and the supralaryngeal friction that is usually produced with it⁸, have made it more salient than its non-normative counterparts in Sweden and Norway. In the dialect of Vemdalen in the province of Härjedalen, Sweden, it must be older than the gemination of postvocalic stops in words that had short stressed syllables in the proto-language. The geminates that were already present in the dialect before short stressed syllables were lengthened, are preaspirated in Vemdalen, the new ones remain unaspirated. But since it is unclear when this process of syllable lengthening took place in this dialect, we don't know exactly when its speakers started to preaspirate their geminate stops. In southern Sweden, on the other hand, preaspiration seems to be a fairly recent phenomenon, considering the fact that it is used more frequently by younger than by older people (Tronnier 2002).

⁷ In some Tuscan dialects the stops are aspirated in intervocalic ("weak") position, instead of spirantised (Bruni 1984: 299).

⁸ Hansson (2003: 69) e.g. transcribes *mætti* 's/he met' as [maʔti], with a palatal fricative instead of an *h*. See also Silverman 2003: 582-3.

The hypothesis also explains why there is no preaspiration in Danish, or any of its dialects. In the other Nordic languages preaspiration became one of the means to make a contrast between fortis and lenis geminates, but in Danish the opposition was simply given up: fortis and lenis geminates merged into singleton lenis stops, and singleton medial stops were spirantised. As a consequence of these changes the only opposition that is left in medial position is the one between stop and glide or approximant. In such a system there is no function for preaspiration.

Concluding remarks

Kortlandt's theory on the origin of preglottalisation and preaspiration in the Germanic languages hinges on the assumption that the lenis stops of Proto-Germanic were voiceless in all positions. He has hence to assume that it is another feature than [voice] that makes the distinction between fortis and lenis stops audible. It is in my opinion more likely that at least in medial position the lenis stops were fully voiced, which made them different from their voiceless fortis counterparts. In wordinitial and pretonic position there probably was a contrast between aspirated voiceless stops and partially or fully voiced unaspirated stops. The lenis stops in medial position became voiced spirants in North Germanic, but the geminates that were created by all kinds of assimilation and lengthening processes remained stops. The distinction between the lenis and fortis geminates could be made more salient in the various dialects by preaspirating the fortis stops. At a later stage [preaspiration] could then in some dialects take over the role of distinctive feature from [voice]. To judge from the evidence from Sienese Italian, Central Swedish and other Nordic dialects that have both preaspiration and fully voiced lenis stops, this appears to be the only possible order of events: the use of preaspiration as a means to stress the voiceless character of the following stop must predate the loss of voice.

Preglottalisation, on the other hand, seems to be closely connected with the loss of the distinction between long and short consonants. In various varieties of British English it serves to enhance the contrast between fortis and lenis stops: in RP it "reinforces" *p, t, c, k* between a sonorant and a following consonant or pause, in Northern English and Central Scots it seems to protect the fortis stops and affricates against lenition in medial position. In West-Jutlandic it is the lenis stops that are "reinforced" by the *v-stød*: preglottalisation makes the lenis stops (more) different from their aspirated fortis counterparts in prepausal position, but in medial position,

where most Danish dialects have given up the distinction between fortis and lenis stops, it merely signals that the consonant is a stop.

Since preglottalisation and preaspiration solve different problems in different languages at different points in time, there is no reason to assume that there is some historic connection between these two phenomena in the Germanic languages. They are autonomous innovations in the dialects in which they occur. In an earlier paper (Perridon 2002) I have shown that the theory that the gemination of consonants in originally short syllables in Swedish (e.g. *droppe* 'drop' ON *dropi*, *vecka* 'week' ON *vika*, *skepp* 'ship' ON *skip*) is in last instance caused by a glottalic feature present in the fortis stops, does not account for the facts of the 'quantity shift' in the Scandinavian languages. The outcome of this shift (or rather series of shifts, as there is no causal connection between the changes in Swedish/Norwegian and those in Icelandic) was that every stressed syllable in these languages contains exactly one long element: either a long vowel followed by a short consonant, or a short vowel followed by a long consonant. I have therefore to conclude that there is no evidence that the fortis stops of the Germanic languages retained the glottalic features of their Proto-Germanic and PIE predecessors after the plain stops of the first PIE series had become spirants (*f*, *þ*, *x*).

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