~~Artikel~~

The Tiberian pronunciation tradition of Biblical Hebrew

Geoffrey Khan ~~(Cambridge, England)~~

Until the second half of the first millennium A.D. the text of the Hebrew Bible was transmitted in a form of writing that represented the consonantal phonemes but left the majority of the vowels and also consonantal gemination without graphic expression. When the Bible was read aloud the reader followed a tradition of pronunciation that was transmitted orally and changed with the passage of time. At some period between the seventh and ninth centuries A.D. a circle of scholars in Tiberias known as Masoretes recorded in written form many of the missing details of the pronunciation of Biblical Hebrew, including the vowels, consonantal gemination and even the distinction between the allophones of some of the consonantal phonemes. They also recorded the musical cantillation of the reading tradition. The system of signs created by the Tiberian Masoretes to represent these details is known as the Tiberian vocalization system. During the Middle Ages other vocalization systems were developed, which used different signs, notably the Babylonian and the Palestinian systems. The Tiberian system, however, became standardized and gradually replaced the others.

We must distinguish the Tiberian vocalization system form the original Tiberian Hebrew pronunciation, which it was designed to represent. This was the pronunciation of Hebrew which was used in the traditional reading of the Bible in the region of Tiberias during the seventh-ninth centuries A.D. In the Middle Ages the Tiberian pronunciation enjoyed considerable prestige and was used not only in Tiberias but also by Jewish scholars throughout the Near East, who considered it superior to the local pronunciation traditions that were commonly followed in their region.[1] Despite this prestige, the Tiberian pronunciation of Hebrew, which was an orally transmitted tradition, is now extinct. None of the pronunciation traditions of the Hebrew Bible that are in use among Jewish communities today derive from the Tiberian pronunciation. The Tiberian vocalization tradition, on the other hand, has survived in written form.

The original Tiberian pronunciation that lies behind the vocalization signs can be reconstructed from several sources. These include:

1. Masoretic and grammatical texts. Of primary importance are the texts from Palestine, especially the orthoepic work *Hidāyat al-qāri* 'The guide for the reader' by the Karaite

[1] Cf. Abraham ibn Ezra, *Seṗer ha-ṣaḥut*, ed. G.H. Lippmann, Fürth, 1827, 3b; al-Qirqisānī, *Kitāb al-ʾanwār wa-l-marāqib*, ed. L. Nemoy, New York, 1939-43, 140; B. Klar, *Meḥqarim veʿiyyunim ballašon uvasiṗrut*, Tel-Aviv, 1954, 44, 328.

grammarian ʾAbū al-Faraj Hārūn.[2] The grammarians from medieval Spain sometimees describe the articulation of a sound in greater detail than the Eastern sources. Although all the Hebrew grammarians in the Middle Ages strove to base their phonetic descriptions on the Tiberian pronunciation tradition, in some cases the descriptions of the Spanish grammarians may have been influenced by a local type of pronunciation that differed from the Tiberian.[3] Their descriptions, therefore, have to be treated with caution.

2. Transcriptions of the Tiberian pronunciation tradition into Arabic script which are found in medieval manuscripts written by Karaites (a medieval sect of Judaism).[4]

3. The use of Hebrew letters and Tiberian vocalization signs to represent other languages. Of particular importance are medieval texts that represent Arabic in this way.[5]

In this paper an attempt is made to present the main features of the Tiberian pronunciation tradition based on the latest research on the aforementioned medieval sources.

Consonants

Most consonants have two forms of graphical representation in the Tiberian vocalization tradition, in that they are written either with or without a dot known as *dageš*. This *dageš* sign is written inside the letter. In the laryngals, pharyngals and *reš*, however, *dageš* is not written, except in a few isolated cases. In some manuscripts, consonants that do not contain *dageš* have a horizontal line written over theem known as *rape*. The marking of this *rape* sign is optional. According to *Hidāyat al-qāri* '*dageš* makes the letter heavy and *rape* makes it soft' (*al-dageš yuṯaqqil al-ḥarf wa-l-rape yurḵīhi*) and '*dageš* is a strengthening which occurs in the phonetic realization of the letter' (*al-dageš huwa tašdīd yaḥṣil fī al-ḥarf ... bi-ḵāṣiyyatihi*) This 'heaviness' of letters is brought about by increased muscular pressure of speech organs resulting in processes such as closure (*al-ṭabq*) or constriction (*al-ḍamm*).[6]

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[2] For this text see 'I. Eldar, *The Study of the art of correct reading as reflected in the medieval treatise Hidāyat al-Qāri,* Jerusalem, 1994; idem, *ʾMukhtaṣar* (an abridgement of) *Hidāyat al-qāri*, a grammatical treatise discovered in the Genizah' in J. Blau and S.C. Reif (eds.), *Genizah research after ninety years: The case of Judaeo-Arabic,* Cambridge, 1992, 67-73, idem, 'Bāb maḥāll al-ḥurūf from *Kitāb Hidāyat al-qāri*: Critically edited with Hebrew translation, commentary and introduction', *Lěšonénu* XLV (1980-81), 233ff. and 'Hebrew orthoepy' *Tarbiẓ* LIV (1984-85), 25-43.

[3] The Spanish grammarian Ibn Janāḥ (11th century) expressed regret that in Spain there were no traditional readers and teachers (*ruwāt wa-ʾaṣḥāb al-talqīn*) with a first-hand knowledge of the Tiberian pronunciation tradition (*Kitāb al-luma*ᶜ. *Le livre des parterres fleuris. Grammaire Hebraïque en arabe d'Abou'l-Walid Merwan ibn Djanah de Cordoue publiée par Joseph Derenbourg,* Paris, 1886, 322-323).

[4] For the background of these texts see G. Khan, *Karaite Bible manuscripts from the Cairo Genizah*, Cambridge, 1990.

[5] See G. Khan, 'The function of the *shewa* sign in Judaeo-Arabic texts' in J. Blau and S.C. Reif eds., *Genizah research after ninety years,* 105-111.

[6] *Hidāyat al-qāri* fol. 9a-b; ed. Eldar, *Lěšonénu* XLV (1980-81), 233-259, lines 15-16, 37-38.

The *dageš* sign was used mainly in two contexts. These are (1) on a consonant that was geminated and (2) on the consonants *bet, gimel, dalet, kap, pe, taw* when they were realized as a plosive.[7] In both circumstances the letter with *dageš* was pronounced with greater pressure than its counterpart without the *dageš*. It is this increased pressure, which is common to both, that the Masoretes marked. They did not explicitly mark consonant gemination but only increased muscular pressure, which was a *component* of gemination.

Dageš was pronounced with varying degrees of strength. The Masoretic sources distinguish three different degrees. These are usually referred to in connection with the word בָּתִּים 'houses', the *taw* of which was said to have been pronounced weaker than in the word בַּתִּים 'baths (units of measure)'. In some circumstances, however, the strength of the *dageš* of בָּתִּים was intermediate between the one heard in the normal pronunciation of this word and the one in the word בַּתִּים. According to the Masorete Ben Naphtali this intermediate strength of *dageš* occurred in all cases of בָּתִּים with a secondary accent on the first syllable. According to Ben Asher it occurred only in two cases where there was a secondary accent, viz. Deut. 6:11, and I Chron. 28:11, both of which have the accents *qadma* and *azla*.[8]

ʾAlep (א). /ʔ/

Phonetic realization: Glottal plosive [ʔ].

ʾAlep takes *dageš* in four words in the standard Tiberian vocalization tradition: וַיְבִיאוּ לוֹ 'and they brought to him' (Gen. 43:26), וַיְבִיאוּ לָנוּ 'and they brought to us' (Ezra 8:18), תְּבִיאוּ 'you shall bring' (Lev. 23:16), לֹא רֹאוּ 'they were not seen' (Job 33:21). According to *Hidāyat al-qāri, ʾalep* could not be made 'heavy' by increased muscular pressure, which was characteristic of *dageš*.[9] In these four places the reader attempted to introduce 'heaviness' into the pronunciation of the *ʾalep* but it was not made 'heavy' or geminated.[10] This would, however, have ensured that the pronunciation of the *ʾlep* was not elided.

Bet /b/

Phonetic realization:

Bet with *dageš* (בּ). Voiced bilabial stop [b].

Bet without *dageš* (ב). Voiced labio-dental [v].

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[7] These consonants had a plosive and a fricative allophone (see below).

[8] *Hidāyat al-qāri*, cited by I. Eldar, 'The double pronunciation of the Tiberian *reš*', *Lěšonénu* XLVIII-XLVIX (1984-5), 27-28. Mishael ben 'Uzzi'el, *Kitāb al-Kilaf*, ed. L. Lipschütz, Jerusalem, 1965, 4, 18; *Sefer Taʿame ha-Miqra* (a Hebrew adaptation of the *Hidāyat al-qāri*), ed. J. Mercerus, Paris, 1565 [facsimile edition, Jerusalem, 1978], AIIIb. See further: A. Dotan ed., *The Diqduqé hattěʿamim of Ahăron ben Moše ben Ašér*, Jerusalem, 1967, I, 15-16; I. Yeivin, *The Aleppo codex of the Bible: A study of its vocalization and accentuation* [in Hebrew], Jerusalem, 1968, 144-145; A. Ben-David, 'Concerning what did Ben Asher and Ben Naphtali differ?', *Tarbiz* XXVI (1956-57), 401-402.

[9] Fol. 9a-9b, ed. Eldar, *Lěšonénu* XLV, lines 20-22.

[10] *al-mutakallim mutakallif li-ʾidkāl al-tatqīl fīhi wa-huwa lā yutaqqal* (fol. 10a, ed. Eldar, *Lěšonénu* XLV, lines 48-49).

Hidāyat al-qāri states that the *bet* with *dageš* is pronounced by closing the lips firmly.[11] In the Karaite transcriptions it is represented by Arabic *bāʾ*.

According to *Hidāyat al-qāri*, *bet* with *rape* is pronounced by closing the lips lightly. Taken by itself, this could be a description of a bilabial articulation of *bet rape*. This is not confirmed, however, by other sources. The light closure of the lips would have accompanied a labio-dental articulation and no doubt it is this secondary feature that the author refers to.[12]

Elsewhere in the *Hidāyat al-qāri* it is stated that *bet rape* and consonantal *waw* have the same pronunciation: 'Every [consonantal] *waw* at the end of a word is pronounced, according to the Palestinians, with [the pronunciation of] *bet rape*'.[13] This feature is alluded to also in the masoretico-grammatical treatise on the *šewa* which was published by K. Levy:[14] 'Know that every *waw* which is prefixed to the beginning of a word and has *šewa* is read with (the pronunciation of) *bet*. I mean it is pronounced as if it were the letter *bet*, as in וְאָמַר "and he shall say" '. We know from David ben Abraham al-Fāsī that in Palestine consonantal *waw* in these circumstances was pronounced as a labio-dental (see the description of *waw* below for details). It follows, therefore, that *bet rape* was a labio-dental.

Hidāyat al-qāri describes the [b] allophone as primary (*ʾaṣl*) and the [v] allophone as secondary (*farʿ*).[15]

Gimel /g/

Phonetic realization:

Gimel with *dageš* (גּ). Voiced velar stop [g].

Gimel without *dageš* (ג). Voiced uvular fricative [ʁ]

According to *Hidāyat al-qāri*, *gimel* with *dageš* was articulated with the middle of the tongue (*wasṭ al-lisān*).[16] The Karaite transcriptions represent it by Arabic *jīm* or, occasionally, by *kāf*. These Arabic letters were pronounced respectively as a voiced palatal plosive [ɟ] and an unvoiced velar plosive [k].[17] *Gimel* without *dageš*, on the other hand, was articulated further back, on the posterior third of the tongue, which is adjacent to the pharynx, opposite the (soft) palate.[18] The Karaite transcriptions represent it with Arabic *ġayn*, which was pronounced as a voiced uvular fricative.[19]

Hidāyat al-qāri describes the [g] allophone as primary (*ʾaṣl*) and the [ʁ] allophone as secondary (*farʿ*).[20]

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[11] Fols. 10b-11a, ed. Eldar, *Lěšonénu* XLV, lines 84-88.

[12] Cf. Eldar's commentary to this passage, n. 75.

[13] Cf. Eldar, חוק אוי"ה ובגדכפ"ת, *HUCA* LV (1984), Hebrew section, p. י.

[14] K. Levy, *Zur masoretischen Grammatik,* Stuttgart, 1936, p. בו.

[15] Fol. 8b, cf. Eldar, *Lěšonénu* XLV, lines 61-73.

[16] Fols. 10a-10b, ed. Eldar, *Lěšonénu* XLV, lines 61-73.

[17] This is the pronunciation described by the early Arabic grammarians Sībawayhi and al-Ḵalīl (8th century). Ibn Sīnā in the 11th century describes *jīm* as pronounced slightly further forward; cf. A. Roman, *Étude de la phonologie et de la morphologie de la koine arabe,* Aix en Provence, 1983, 101-106, 218. The Karaite transcriptions usually render *gimel dageš* with *jīm* due to its being a voiced consonantal plosive close to the place of articulation of [g]. It was preferred to *kāf,* which differed from *jīm* in being not only voiceless and but also aspirated. It was a general principle of the transcriptions that voiced sounds were transcribed by one that was voiced but of a slightly different place of articulation rather than by an unvoiced letter of the same place of articulation.

[18] *ṯulṯ al-lisān mimmā yalī al-ḥulqūm qudām al-ḥank* (*Hidāyat al-qāri*, fol. 10a, ed. Eldar, *Lěšonénu* XLV, lines 58-59).

[19] According to the early Arabic grammarians Sībawayhi and al-Ḵalīl; cf. Roman, *Étude*, 218.

[20] Fols. 8b, 10a, cf. Eldar, *Lěšonénu* XLV, 254, n. 58.

Dalet /d/

Phonetic realization:

Dalet with *dageš* (ד): Voiced post-dental stop [d].

Dalet without *dageš* (ד): Voiced post-dental fricative [ð].

According to *Hidāyat al-qāri, daleṭ* was articulated with 'the end of the tongue and the flesh of the teeth', i.e. the gums.[21] Likewise Saadya describes the place of articulation of *daleṭ* as being adjacent to the inside of the upper teeth.[22] When the letter had *dageš* the tongue was pressed firmly against the gums. When it was without *dageš* the tongue was pressed lightly against the gums. Both forms of the letter were articulated in the same place. The term 'end of the tongue' could include both the tip and the blade. Most versions of *Seper Yeṣira* state that *daleṭ* was articulated with 'the beginning of the tongue' (בראש הלשון),[23] but this is equally vague. The Spanish grammarian Ibn Janāḥ (11th century) specifies that it was articulated with the blade of the tongue and not the tip.[24] This corresponds to the description in one version of *Seper Yeṣira*, where it is stated that the letters דטלנת were articulated with the 'middle' of the tongue.[25] It is easier, however, to interpret *Hidāyat al-qāri* as referring to the contact between the tongue tip and the gums. An articulation with the blade of the tongue with the gums would have involved contact with the teeth.

Hidāyat al-qāri describes the [d] allophone as primary (*ʾaṣl*) and the [ð] allophone as secondary (*farʿ*)[26]

The medieval scholar Isaac Israeli (9th-10th centuries A.D.), who had expert knowledge of the Tiberian reading tradition, is said to have pronounced *daleṭ* without *dageš* with a secondary 'emphatic' (i.e. velarized or uvularized) articulation [ð̰] in two words, viz. אַפַּדְנוֹ 'his palace' (Dan. 11:45) and נִידְרְכוּ 'and they have bent' (Jer. 9:2).[27]

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[21] *ṭaraf al-lisān maʿa laḥm al-ʾasnān* (Fol. 10b, ed. Eldar, *Lěšonénu* XLV, lines 67-69).

[22] *wa fī ḏṭlnṭ ...ʾinnahā tujāwir al-ʾasnān min ḏāḵilihā min ʾaʿlāhā* (*Commentaire sur le Séfer Yesira ou Livre de création par le Gaon Saadya de Fayyoum*, ed. and trans. M. Mayer Lambert, Paris, 1891, 75).

[23] Cf. I. Gruenwald, 'A preliminary critical edition of *Sefer Yezira*', *Israel Oriental Studies* I (1971), 147. *Seper Yeṣira* is likely to have been written in the 7th or 8th century A.D. This date has been proposed on the basis of its content. The lack of any reference to vocalization signs would place it before the vocalization systems had been fully developed by the Masoretes, whereas its phonetic classification of the Hebrew letters is not found in the Talmud; cf. M. Mayer Lambert (ed. and tr.), *Commentaire sur le Séfer Yesira*, iv. Some of its phonetic concepts have parallels in the works of the Arab grammarians, which may be taken as evidence that it was not written before the beginning of the Arab period; cf2. M. Bravmann, *Materialien und Untersuchungen zu den phonetischen Lehren der Araber*, Göttingen, 1934, 29. According to S. Morag (*Festschrift for N.H. Ṭur Sinai*, Jerusalem, 1959-60, 233) the phonetic descriptions in *Seper Yeṣira* reflect the pronunciation of Hebrew in Babylonia, so it must be used with caution when reconstructing the Tiberian pronunciation tradition.

[24] *Kitāb al-lumaʿ*, ed. J. Derenbourg, Paris, 1886, 28: *fa-ʾinna ḏālika al-ṭaraf laysa huwa ʾasalat al-lisān bal mā huwa ʾarfaʿ min al-ʾasala qalīlan* 'this end (of the tongue) is not the tip of the tongue but what is posterior to the tip'.

[25] דטלנת עלי חצי הלשון משתמשות in the commentary by Saadya, ed. Mayer Lambert, 74.

[26] Fol. 8b; cf. Eldar, *Lěšonénu* XLV, 254, n. 58.

[27] Cf. M. Schreiner, 'Zur Geschichte der Aussprache des Hebräischen', *ZAW* VI (1886), 221; J. Mann, *Texts and studies in Jewish history and literature*, New York, 1972, 670 n. 106; L. Dukes, קונטרס המסורת, Tübingen, 1845-46, 9, 73; M. Grossberg, *Sefer Yezirah ascribed to the Patriarch Abraham, with commentary by Dunash ben Tamim*, London, 1902, 24.

He (ה) /h/

Phonetic realization: Glottal fricative [h].

According to *Hidāyat al-qāri* the letter *he* could not be made 'heavy' by increased muscular pressure and so could not take *dageš*.[28] A dot in final *he* indicates that the letter was to be pronounced as a consonant as opposed to being a *mater lectionis* for a final vowel, e.g. לָהּ [lɔːh] 'to her', but מַלְכָּה [malkɔː] 'queen'. A dot with this function in final *he* was known as *mappiq* (litterally: 'bringing out, pronouncing') or, in the Arabic terminology of *Hidāyat al-qāri*, *ẓuhūr* ('appearance').[29]

Waw (ו) /w/

Phonetic realization: Labio-dental [v] and labio-velar semi-vowel [w].

According to *Hidāyat al-qāri,* the place of articulation was the lips.[30] The letter was pronounced by closing the lips lightly. Taken by itself, this would be a description of a bilabial articulation. The light closure of the lips, however, would have accompanied a labio-dental articulation and it may have been this secondary feature that the author refers to.[31]

David ben Abraham al-Fāsī (10th century), the Palestinian Karaite lexicographer, states explicitly that in Palestine consonantal *waw* both with and without *dageš* was pronounced as a labio-dental.[32] Other sources refer to the fact that in Palestine consonantal *waw* was pronounced the same way as *beṯ* without *dageš*, i.e. [v].[33] This is confirmed by the Karaite transcriptions, some of which represent both *beṯ rape* and consonantal *waw* by Arabic *bāʾ*, e.g. اوِيبِب (אֹיְבָיו) – 'his enemies' Num. 32:21, Genizah MS 1).[34]

When preceded or followed by a *u* vowel *waw* was pronounced as a labio-velar semi-vowel [w]. This is referred to by Mišaʾel ben ʿUzziʾel in connection with the word וּפֻוָּה [ufuwˈwɔː] 'and Puwwa' (proper name) (Gen. 46:13).[35] In some manuscripts a dot is added to consonantal waw befor a *u* vowel, e.g. וַיִּשְׁתַּחֲוֻוּ [vajjiʃtaːḥaˈwuː] 'and they prostrated themselves' (Deut. 29:25), טָווּ [tɔːˈwuː] 'they span' (Ex. 35:26).[36] This dot can be identified as the sign for the vowel sign *šureq* /u/ and reflects the pronunciation of the *waw* as the glide [w]. Sometimes *waw* before a *u* vowel is marked with *rape*, e.g. וְנִקְוֺו [vaniqˈwuː] 'and they shall gather' (Jer. 3:17).[37] This no doubt reflects the weaker, more open pronunciation of the approximant [w] relative to the labio-dental fricative [v].

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[28] Fol. 9a-9b, ed. Eldar, *Lěšonénu* XLV, lines 20-22.

[29] Fol. 9b, ed. Eldar, *Lěšonénu* XLV, line 31.

[30] Fols. 10b-11a, ed. Eldar, *Lěšonénu* XLV, lines 84-88.

[31] Cf. Eldar, *Lěšonénu* XLV, n. 75.

[32] *Kitāb Jāmiʿ al-Alfāẓ*, ed. S.L. Skoss, vol. II, New Haven, 1945, 451-2.

[33] Cf. Mišaʾel ben ʿUzziʾel, *Kitāb al-Ḵilaf,* ed. Lipschütz, Jerusalem 1965, 20; Eldar, *The Hebrew Language Tradition in Medieval Ashkenaz (ca. 950-1350 C.E.),* Jerusalem, 1978, vol. I, 85; idem, *Lěšonénu* XLV (1980-81), 259, and HUCA LV (1984), Hebrew section, pp. י-יא.

[34] Cf. G. Khan, *Karaite Bible manuscripts form the Cairo Genizah,* Cambridge, 1990.

[35] Mišaʾel ben ʿUzziʾel, *Kitāb al-Ḵilaf,* ed. Lipschütz, Hebrew section p. כ.

[36] Cf. I. Yeivin, *Introduction to the Tiberian Masorah* [translated by E.J. Revell], Scholars Press, 1980, 285-6.

[37] Yeivin, *Introduction to the Tiberian Masorah,* 286.

Zayin (ז) /z/

Phonetic realization: Voiced alveolar sibilant [z].

According to *Hidāyat al-qāri,* the place of articulation is the teeth.[38] This evidently refers to the movement of the teeth accompanying the pronunciation of the sibilants. The author does not mention the action of the tongue, which was the main articulator.[39] The *Seper Yeṣira* describes *zayn* as being articulated in the teeth with a 'resting tongue', or a 'flat tongue' according to some versions.[40] In both these passages the intention may have been that the tongue tip was not engaged in the articulation of the letter, i.e. it was articulated with the blade.

Hidāyat al-qāri mentions a variant of the letter *zayin* which is referred to by the Tiberian scholars as *zāy*[41] *makrūḵ*.[42] The epithet *makrūḵ* was used by the Tiberian scholars to describe also a variant type of *reš*. It apparently referred to an emphatic (i.e. velarized or uvularized) articulation of the letter.[43] It appears, therefore, that *zayin* had an emphatic allophone [ẓ], though its distribution is unknown.

Ḥeṯ (ח) /ḥ/

Phonetic realization: Unvoiced pharyngal fricative [ḥ]

Hidāyat al-qāri does not distinguish between the place of articulation of the laryngals and that of the pharyngals. Some medieval grammarians, however, state that *ḥeṯ* and its voiced conterpart *ʿayn* were articulated less deep in the throat than *ʾalep* and *he*.[44] *Ḥeṯ* could not be made 'heavy' by *dageš*.[45] It is transcribed by Arabic *ḥāʾ* in the Karaite transcriptions.

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[38] Fol. 10b, ed. Eldar, *Lĕšonénu* XLV, line 77.

[39] Cf. Eldar, *Lĕšonénu* XLV, n. 70.

[40] בין שינים ובלשון ישן/בלשון שכובה ושטוחה, ed. Gruenwald, 147.

[41] The *Hidāya* uses the Arabic letter name.

[42] Eldar, *Lĕšonénu* XLVIII-XLIX, 32. The Yemenite orthoepic treatise known as the Hebrew *Maḥberet ha-Tĭjān*, which was based on the long version of the *Hidāya*, contains a similar statement: וכן יש להם זי"ן נקרא מכרוך ואינע אצלינו 'They (i.e. the Jews of Palestine) have a *zayin* called *makrūḵ*, but it is unfamiliar to us (i.e. the Jews of Yemen' (ed. M.J. Derenbourg, *Manuel du lecteur*, Paris, 1879, 81); cf. S. Morag, 'שבע כפולות בנד כפרת' *Festschrift for N.H. Tur Sinai*, Jerusalem, 1959-60, 219, n. 45.

[43] Cf. G. Khan, 'The pronunciation of *reš* in the Tiberian tradition of Biblical Hebrew', to appear in *HUCA*.

[44] Ibn Janāḥ, *Kitāb al-luma*ʿ, ed. Derenbourg, 26-27; Menahem ben Saruq, *Maḥberet*, ed. J. Filipowski, London, 1854, 6.

[45] *Hidāyat al-qāri*, fol. 9a-9b, ed. Eldar, *Lĕšonénu* XLV, lines 20-22. Certain features of vocalization suggest that gemination of *ḥet* was lost later than that of its voiced counterpart *ʿayn*. When the gemination of these consonants was given up, the preceding vowel was lengthened by compensation. At some period in the 1st millennium A.D. the vowel shift [aː] > [ɔː] took place in the reading tradition that was the ancestor of the Tiberian pronunciation. An originally short [a] vowel that has been compensatorily lengthened before *ʿayn* has the quality of [ɔː] whereas before *ḥet* it often has the quality of [aː], e.g. הָעָם [hɔːʕɔːm] < *[haʕʕaːm] vs. הַחֹרֶשׁ [haːḥoːðeš] < *[haḥḥoːðeš]. This can be explained as a reflexion of the fact that the loss of gemination of *ʿayn* took place before or during the period in which the [aː] > [ɔː] shift operated. The loss of gemination of *ḥet*, however, took place after it had ceased to operate. It appears from the vocalization that the gemination of also *he* was lost later than that of *ʿayn*, e.g. הַהוּא [haːhuː < *hahhuː]. This feature of historical phonology was no doubt the result of the unvoiced gutturals [h] and [ḥ] having a more *fortis* articulation than the voiced [ʕ].

Ṭeṭ (ט) /ṭ/

Phonetic realization: emphatic (i.e. velarized or uvularized) unvoiced alveolar plosive [ṭ].
According to *Hidāyat al-qāri,* it was articulated with the tongue tip and the gums.[46]

Yod (י) /j/

Phonetic realization: palatal unrounded semi-vowel [j].
According to *Hidāyat al-qāri,* it was articulated with the middle of the tongue (*wasṭ al-lisān*). Saadya states that the Tiberians pronounced *yod* with *dageš* like Arabic *jīm*.[47] According to the early Arabic grammarians Sībawayhi and al-Ḵalīl (8th) century) *jīm* was realized as a voiced palatal stop [ɟ], which had the same place of articulation as *yāʾ* [j]. In some of the early Arabic dialects geminated *yāʾ* was pronounced like *jīm*. This was the result of strengthening the articulation of [j] to a stop.[48] A similar phenomenon seems to have taken place in the Tiberian pronunciation tradition.

Kap /k/

Phonetic realization:
Kap with *dageš* (כּ). Unvoiced velar stop [k].
Kap without *dageš* (כ). Unvoiced uvular fricative [χ].
According to *Hidāyat al-qāri, kap* with *dageš* was articulated with the middle of the tongue (*wasṭ al-lisān*).[49] *Kap* without *dageš*, on the other hand, was articulated further back, on the posterior third of the tongue, which is adjacent to the pharynx, opposite the (soft) palate.[50] The Karaite transcriptions represent it with Arabic *ḵāʾ*, which was pronounced as an unvoiced uvular fricative.[51]
We know from Greek transcriptions that in the first half of the first millennium A.D. plosive *kap* was pronounced with aspiration.[52] This was likely to have been the case also in the Tiberian pronunciation tradition. In the Karaite transcriptions plosive *kap* with *dageš* is represented by Arabic *kāf*, which was aspirated.[53]
Hidāyat al-qāri describes the [k] allophone as primary (*ʾaṣl*) and the [χ] allophone as secondary (*farʿ*).[54]

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[46] Fol. 10b, ed. Eldar, *Lěšonénu* XLV, lines 67-69. See the desscription of *daleṭ:* above for a discussion of this passage.

[47] Commentary on the *Seper Yeṣira*, ed. Lambert, 42-43.

[48] Cf. Roman, *Étude,* 101-106, 218. Ibn Sīnā in the 11th century describes *jīm* as pronounced slightly further forward (Roman, 243-46).

[49] Fols. 10a-10b, ed. Eldar, *Lěšonénu* XLV, lines 61-73.

[50] *ṯulṯ al-lisān mimmā yalī al ḥulqūm qudām al-ḥank* (*Hidāyat al-qāri*, fol. 10a, ed. Eldar, *Lěšonénu* XLV, lines 58-59).

[51] According to the early Arabic grammarians Sībawayhi and al-Ḵalīl; cf. Roman, *Étude*, 218.

[52] Cf. E.Y. Kutscher, *JJS* X (1965), 24-35.

[53] Cf. Roman, *Étude,* 55.

[54] Fols. 8b, 10a; cf. Eldar, *Lěšonénu* XLV, 254, n. 58.

Lameḏ (ל) /l/

Phonetic realization: Voiced alveolar lateral continuant [l].
According to *Hidāyat al-qāri,* the articulation of this letter involved the contact of the tongue tip with the gums.[55]

Mem (מ) /m/

Phonetic realization: Voiced bi-labial nasal [m].

Nun (נ) /n/

Phonetic realization: Voiced alveolar nasal [n].
According to *Hidāyat al-qāri,* it was articulated with the end of the tongue and the gums.[56]
Ibn Janāḥ distinguishes between the *nun* with a following vowel, which was pronounced with an admixture of nasal resonance, and *nun* without a vowel, which was articulated entirely in the nasal cavity.[57]

Samek̲ (ס) /s/

Phonetic realization: Unvoiced alveolar sibilant [s].
According to the medieval sources, it was articulated in the same place as the letter *zayin*,[58] apparently with the blade of the tongue rather than the tip (see the description of *zayin* above).

ʿAyin (ע) /ʕ/

Phonetic realization: Voiced pharyngal fricative [ʕ].
Hidāyat al-qāri does not distinguish between the place of articulation of the laryngals and that of the pharyngals. Some medieval grammarians, however, state that *ḥeṯ* and its voiced counterpart *ʿayn* were articulated less deep in the throat than *ʾalep* and *he*.[59] *ʿAyin* could not be made 'heavy' by *dageš*.[60]

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[55] Fol. 10b, ed. Eldar, *Lěšonénu* XLV, lines 67-69. See the description of *daleṯ* above for a discussion of this passage.
[56] Fol. 10b, ed. Eldar, *Lěšonénu* XLV, lines 67-68.
[57] *Kitāb al-luma*ʿ, ed. Derenbourg, 27-28.
[58] *Hidāyat al-qāri*, fol. 10b, ed. Eldar, *Lěšonénu* XLV, line 77. *Seper Yeṣira*, ed. Gruenwald, 147.
[59] Ibn Janāḥ, *Kitāb al-luma*ʿ, ed. Derenbourg, 26-27; Menahem ben Saruq, *Maḥbereṯ*, ed. Filipowski, 6.
[60] *Hidāyat al-qāri*, fol. 9a-9b, ed. Eldar, *Lěšonénu* XLV, lines 20-22.

Pe /p/

Phonetic realization:

Pe with *dageš* (פּ). Unvoiced bi-labial stop [p].

Pe without *dageš* (פ). Unvoiced labio-dental fricative [f].

According to *Hidāyat al-qāri*, *pe* with *dageš* was pronounced by closing the lips firmly and *pe* without *dageš* was pronounced by closing the lips lightly.[61] Taken by itself, this could be a description of a bilabial articulation [ɸ]. This appears, however, to be only a partial description of the sound, as is the case with the description of *bet* without *dageš* (see above). The light closure of the lips would have accompanied a labio-dental articulation and no doubt it is this secondary feature that the author refers to.[62]

Hidāyat al-qāri describes the [p] allophone as primary (*ʾaṣl*) and the [f] allophone as secondary (*farʿ*).[63]

Saadya refers to the existence a 'hard' *pe* in the word אַפַּדְנוֹ 'his palace' (Daniel 11:45), which he describes as 'between *bet* and *pe* with *dageš*'.[64] This appears to be referring to an unaspirated, fortis realization of [p]. One may infer from this that the voiced stop *bet* was unaspirated whereas the normal unvoiced stop *pe* was aspirated. This would correspond to Arabic, in which, according to the early grammarians, *bāʾ* was unaspirated (*majhūr*), whereas voiceless unemphatic plosives and fricatives were aspirated (*mahmūs*).[65] We know form Greek transcriptions that in the first half of the first millennium A.D. plosive *pe* was pronounced with aspiration.[66] This appears also to have been the case in the Tiberian pronunciation tradition. Dunash ben Tamim reports that the scholar Isaac Israeli (9th-10th centuries), who was 'an expert in the reading of the Tiberians', pronounced the *daleṯ* in the word אַפַּדְנוֹ as the emphatic (velarized or uvularized) Arabic letter *ẓāʾ*.[67] This implies that the 'hard' *pe* was also emphatic [p]. The *daleṯ* was pronounced emphatic by assimilation.[68]

Ṣade (צ) /ṣ/

Phonetic realization: Unvoiced emphatic (velarized or uvularized) alveolar sibilant [ṣ].

According to the medieval sources it was articulated in the same place as the letters *zayin* and *sameḵ*,[69] apparently with the blade of the tongue rather than the tip (see the description of *zayin* above). In the Karaite transcriptions it is represented by Arabic *ṣād*, which was an unvoiced, emphatic, alveolar sibilant.

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61 Fols. 10b-11a, ed. Eldar, *Lěšonénu* XLV, lines 84-88.

62 Cf. Eldar's commentary to this passage, *Lěšonénu* XLV, n. 75.

63 Fol. 8b; cf. Eldar, *Lěšonénu* XLV, 254, n. 58.

64 *wa-ʾammā al-fāʾ al-ṣalba fa-fīmā bayn al-be wa-l-pe al-dageš*, Commentary on *Seper Yeṣira*, ed. Mayer Lambert, 42.

65 Cf. Roman, *Étude*, 54-55.

66 Cf. E.Y. Kutscher, *JSS* X (1965), 24-35.

67 Cf. M. Schreiner, 'Zur Geschichte der Aussprache des Hebräischen' *ZAW* VI (1886), 221; J. Mann, *Texts and studies in Jewish history and literature,* New York, 1972, 670 n. 106; L. Dukes, קונטרס המסורת, Tübingen, 1845-46, 9, 73; M. Grossberg, *Sefer Yezirah ascribed to the Patriarch Abraham, with commentary by Dunash ben Tamim,* London, 1902, 24.

68 Cf. R. Steiner, 'Emphatic פ in the Massoretic pronunciation of אַפַּדְנוֹ (Dan 11:45),' *Hebrew and Arabic studies in honour of Joshua Blau,* ed. M. Bar Asher *et al.,* Tel Aviv – Jerusalem, 1993, 551-561.

69 *Hidāyat al-qāri*, fol. 10b, ed. Eldar, *Lěšonénu* XLV, line 77. *Seper Yeṣira*, ed. Gruenwald, 147.

Ibn Ḵaldūn refers to a voiced allophone of *ṣade* [ẓ] in the pronunciation of the name אֲמַצְיָהוּ, i.e. [ʔamaẓˈjɔːhuː].[70]

Quṗ (ק) /q/

Phonetic realization: Unvoiced uvular plosive [q].

According to *Hidāyat al-qāri* it was articulated with the middle of the tongue (*wasṭ al-lisān*), i.e. somewhere on the tongue betweeen the back third and the tip.[71] This was further forward than fricative *kap* and *gimel*, which were articulated with the back third of the tongue. It would appear that the place of articulation of Tiberian *quṗ* was the same as that of Arabic *qāf*. According to the early Arabic grammarians *qāf* was articulated between the velar stop *kāf* and the uvular fricatives *ḵāʾ* and *ġayn*. It would appear from their descriptions that it was voiced and unaspirated, i.e. [G], though an unvoiced pronunciation [q] existed in some dialectal varieties of Arabic.[72] We have no sources to establish whether the Tiberian *quṗ* was in fact [G]. It is relevant to point out, however, that in Greek transcriptions from the first half of the first millennium A.D. *quṗ* is represented by *kappa*, which was an unaspirated [k].

Reš (ר) /r/

Phonetic realization: Voiced uvular roll [R] or uvular frictionless continuant [ʁ̞] and emphatic (velarized or uvularized) linguo-alveolar roll [ɾˠ].

According to *Hidāyat al-qāri*, the Tiberians pronounced *reš* in two different ways, one primary and one secondary, as was the case with the letters בגדכפת. The basic articulation of the Tiberian *reš* was uvular. It is said to have been articulated with the middle third of the tongue (*wasṭ al-lisān*), as were the letters *qūp*, plosive *kap*, plosive *gimel* and *yod*.[73] It is not clear whether this uvular *reš* was realized as a roll [R] or as a frictionless continuant [ʁ̞]. It could not have been an uvular fricative [ʁ], since this was the realization of *gimel* without *dageš*. The secondary form of *reš* was pronounced in the environment of the alveolar consonants דזצתטסלן. This allophone of *reš* was alveolar, by assimilation to the adjacent alveolar consonants. It can be established from medieval sources that it was also emphatic (velarized or uvularized).[74] We learn the specific rules for the distribution of the allophone

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[70] *ʾAmaṣyāhū bi-fatḥ al-hamza wa-l-mīm wa-sukūn al-ṣād al-mušamma bi-l-zāy* 'Amaṣyāhū, with *a* after the *hamza* and the *mīm* and no vowel after the *ṣād*, which resembles (literally: has a smell of) *zāy*', i.e. it resembles *zāy* but is not totally assimilated to it. This passage is cited by M. Schreiner, 'Zur Geschichte der Aussprache des Hebräischen', *ZAW* VI (1886), 254.

[71] Fols. 10a-10b, ed. Eldar, *Lěšonénu* XLV, lines 61-72.

[72] Al-Ḵalīl, *Kitāb al-ʿayn*, ed. S. Wild, Wiesbaden, 1965; Al-Azharī, *Tahḏīb al-luġa* I, Cairo, 1964, 48; Sībawayhi, *al-Kitāb*, ed. H. Derenbourg II, Paris, 1889, 453, Roman, *Étude*, 49, 110, 140, 215-6, M. Rodinson, 'Sur la prononciation ancienne du *qāf* arabe', *Mélanges Marcel Cohen*, The Hague – Paris, 1970, 289-319.

[73] I. Eldar, 'ההגייה הכפולה של הרי"ש הטברנית', *Lěšonénu* XLVIII-XLIX (1984-85), 22-34.

[74] See G. Khan, 'The pronunciation of *reš* in the Tiberian tradition of Biblical Hebrew', to appear in *HUCA*. Saadya refers to it as *reš makrūḵ* (Commentary on *Seper Yeṣira*, ed. Lambert, 29). The epithet *makrūḵ* is a calque on the Arabic phonetic term *muṭbaq* 'emphatic'. Dunash ben Tamim reports that the *daleṭ*, in the word נִיְדְרְכוּ (Jer. 9:2), which is contiguous to the alveolar *reš*, was pronounced emphatic by Isaac Israeli, 'an expert in the Tiberian reading tradition'; cf. M. Schreiner, 'Zur Geschichte der Aussprache des Hebräischen', *ZAW* VI (1886), 221; J. Mann, *Texts and studies in Jewish history and literature*, New York, 1972, 670 n. 106; L. Dukes,

[ɾ] in *Hidāyat al-qāri*[75] and in Saadya's commentary on *Seper Yeṣira*.[76] It occurred when (a) the *reš* or one of these alveolars had *šewa* or (b) when the *reš* occurred in word final position, e.g. דַרְכּוֹ [daɾˈkoː] 'his way' (Gen. 24:21), יִזְרֹק [jizˈɾoːq] 'he scatters' (Isa. 28:25), מַצָּרֶף [maṣˈɾeːf] 'crucible' (Prov. 17:3), טַרְפֵּי [taɾˈpeː] 'leaves' (Ezek. 17:9), לִרְחֹץ [liɾˈḥoːṣ] 'to wash' (Gen. 24:32), סָרְנֵי [saɾˈneː] 'rulers' (Josh. 13:3), וְאָזְרֵם [voːʔezˈɾeːm] 'and I winnowed them' (Jer. 15:7), בְּמִזְרֶה [bamizˈɾeː] 'with a pitch fork' (Jer. 15:7), צְרוּפָה [ṣaɾuːˈfoː] 'smelted', לִמְטַר [limˈtaːɾ] 'through the rain'.

Sin (שׂ) /s/

Phonetic realization: Unvoiced alveolar sibilant [s].
This had the same pronunciation as *sameḵ* in the Tiberian tradition.
At an earlier historical period *sin* and *sameḵ* were distinct in pronunciation and represented separate phonemes, as is shown by mimimal pairs such as סָר [saːɾ] 'stubborn' and שַׂר [saːɾ] 'ruler, captain'.

Šin (שׁ) /š/

Phonetic realization: Unvoiced palato-alveolar fricative [ʃ].
According to the medieval sources its place of articulation was the same as that of the sibilants *zayin* and *sameḵ*, namely the teeth.[77] As was pointed out above in the entry on *zayin*, this did not necessarily imply that the teeth were one of the primary articulators. It is described by Ibn Janāḥ as a 'spreading letter' (*ḥarf al-tafaššī*),[78] which no doubt referred to its palatalized articulation. In the Karaite transcriptions it is represented by Arabic *šīn*, which, according to the Arab grammarians, was a palatal fricative [ç], a pre-palatal fricative [ç+] or an alveolo-palatal [ɕ].[79] Tiberian *šin* was not primarily palatal, since it was not included by *Hidāyat al-qāri* among the letters that are pronounced with the middle of the tongue.

Taw /t/

Phonetic realization:
Taw with *dageš* (תּ): Unvoiced alveolar stop [t].
Taw without *dageš* (ת): Unvoiced alveolar fricative [θ]
According to *Hidāyat al-qāri*, *taw* was articulated with 'the end of the tongue and the flesh of the teeth', i.e. the gums.[80] Likewise Saadya describes the place of articulation of *taw* as being adjacent to the inside of the upper teeth.[81] When the letter had *dageš* the tongue was pressed firmly against the gums. When it was without *dageš* the tongue was pressed lightly

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קונטרס המסורת, Tübingen, 1845-46, 9, 73; M. Grossberg, *Sefer Yezirah ascribed to the Patriarch Abraham, with commentary by Dunash ben Tamim,* London, 1902, 24.

[75] MS II Firkovitch Arab. Evr. 2390, fol. 18b. Eldar, *Lěšonénu* XLVIII-XLIX, 29-30.

[76] Ed. Mayer Lambert, 79.

[77] *Hidāyat al-qāri*, fol. 10b, ed. Eldar, *Lěšonénu* XLV, line 77. *Seper Yeṣira*, ed. Gruenwald, 147.

[78] *Kitāb al-luma*ᶜ, ed. Derenbourg, 27.

[79] Roman, *Étude,* 202, 218, 248.

[80] Fol. 10b, ed. Eldar, *Lěšonénu* XLV, lines 67-69.

[81] *wa fī dṭlnt ...ʾinnahā tujāwir al-ʾasnān min dāḵilihā min ʾaᶜlāhā* in his commentary on *Seper Yeṣira*, ed. Mayer Lambert, 75.

against the gums. Both forms of the letter were articulated in the same place. It appears to have been pronounced with the tip of the tongue rather than the blade (see the description of *daleṯ* above).

Hidāyat al-qāri describes the [t] allophone as primary (*ʾaṣl*) and the [θ] allophone as secondary (*farʿ*).[82]

We know from Greek transcriptions that in the first half of the first millennium A.D. plosive *taw* was pronounced with aspiration.[83] This was likely to be the case also in the Tiberian pronunciation tradition. In the Karaite transcriptions plosive *taw* with *dageš* is represented by Arabic *tāʾ*; which was aspirated.[84]

Distribution of the allophones of the letters בגדכפ"ת.

In general, the fricative allophones of these letters (i.e. the forms written without a *dageš* sign: [v], [ʁ], [ð], [χ], [f] and [θ] respectively) occur after a vowel when the letter is not geminated, e.g. רַב [ʀaːv], שָׁבַר [šɔːˈvaʀ], יִשְׁכְּבוּ [jiškaˈvuː]. In many cases, however, the preceding vowel had been elided some time in the history of the language before the period of the Masoretes but the letter nevertheless remained a fricative, e.g. בְּשָׁכְבוֹ [bašɔːχˈvoː] < **bašukuˈbō*, 'when he lies', מַלְכֵי [malˈχeː] < **malaˈkē* 'kings', שָׁכְבוּ [šɔːχˈvuː] < **šākaˈbū* 'they lay down'. In a few such cases a plosive and a fricative are in free variation, e.g. רִשְׁפֵי [ʀišˈfeː] and רִשְׁפֵי [ʀišˈpeː] 'flames'. The distribution of the plosive and fricative allophones, therefore, is not completely predictable from the phonetic context in Tiberian Hebrew since it is an alternation that was inherited from an earlier stage of the language.[85]

In theory the phonetic processes described above could have given rise to a phonemic opposition between the plosive and fricative forms of the letters. However, no certain minimal pair that proves this opposition is attested in the corpus of the Hebrew Bible. Z. Harris[86] proposed the hypothetical minimal pair אַלְפֵי [ʔalˈfeː] 'thousands' vs. אַלְפֵי [ʔalˈpeː] 'two thousand'. The form of the second word in the pair is deduced from what we know about Hebrew morphology but is not attested.

Vowels

Tiberian Hebrew had the following vowel system:

i	u
e	o
ɛ	ɔ
a	

[82] Fol. 8b; cf. Eldar, *Lěšonénu* XLV, 254, n. 58.

[83] Cf. E.Y. Kutscher, *JSS* X (1965), 24-35.

[84] Cf. Roman, *Étude*, 55.

[85] This is a simplified account of the distribution of the בגדכפ"ת allophones. For a more detailed description see I. Yeivin, *Introduction to the Tiberian Masorah*, 285-296.

[86] Z. Harris, 'The linguistic structure of Hebrew', *JAOS* LXI (1941), 143-167.

Patah (ַ) /a/

Phonetic realization: Open, unrounded. There was no phonemic opposition between front and back vowels in the open position, so the allophonic scatter of /a/ is likely to have included both front [a] and back [ɑ] qualities. Evidence for this can be found in Judaeo-Arabic texts with Tiberian vocalization.[87]

Segol (ֶ) /ɛ/

Phonetic realization: front, half-open unrounded [ɛ]

Qameṣ (ָ) /ɔ/

Phonetic realization: back, half-open rounded [ɔ].[88]

Ṣere (ֵ) /e/

Phonetic realization: front, half-close unrounded [e]

Ḥolem (ֹ) /o/

Phonetic realization: back, half-close rounded [o]

Ḥireq (ִ) /i/

Phonetic realization: front, close, unrounded [i]

Šureq (וּ), qibbuṣ (ֻ)[89] /u/

Phonetic realization: back, close, rounded [u]

Vowel length

Vowel length is in most cases predictable from syllable structure and the placement of stress. Meaningful contrasts between words were not usually made by differences in vowel length alone. Differences in length are in virtually all cases relatable to differences in syllable structure or stress placement. Length was not an independent

[87] In one text (T-S Ar. 8.3), for instance, which uses both *patah* and *qameṣ* signs, *patah* is used to represent Arabic *fatḥa* both in the environment of emphatic consonants, where it would be expected to have a back quality [ɑ] (e.g. אַעְטָם [ʔɑʕzɑm]), and also in the environment of non-emphatics, where a front quality [a] would be expected (e.g. וְתַפְּי [watafī]). The *qameṣ* sign is used in this text to represent a back vowel somewhere in the region of mid vowels [ɔ] and [o] which resulted from the contraction of the diphthong [aw], e.g. פָּנֵק [fɔ̄q].

[88] Evidence for the *qameṣ* and *segol* being vowels of the same degree of opening may be found perhaps in the tendency of *patah* to shift *segol* in the environment of *qameṣ* in some forms, e.g. אַחֵי, אַחִים but אָחִיו, אָחָיו.

[89] These are orthographic variants of the same vowel.

contrastive feature of vowels. The vowel *qameṣ* may have been an exception, since pairs of words can be found in which a contrast of meaning appears to have been made only by a difference in length of the vowel, e.g. אָכְלָה [ʔɔχˈlɔ:] 'food' vs. אָכְלָה [ʔɔ:χˈlɔ:] 'she ate'. This arose as a result of the fact that *šewa* after a historically long vowel was usually silent in Tiberian Hebrew.[90] Possible other minimal pairs are words such as דָּמִי 'silence' and דָּמִי 'my blood'. The validity of both such minimal pairs, however, is not completely certain (see below).

The basic contexts for the occurrence of a long vowel are (1) a stressed syllable or (2) an open unstressed syllable. Examples: מֶלֶךְ [ˈmɛ:lɛχ] 'king'; יִשְׁמַע [jiʃˈma:ʕ] 'he hears', הַהוּא [ha:ˈhu:] 'that'. Many words carry a secondary stress in adition to the main stress, e.g. הָאָדָם [hɔ:ʔɔ:ˈðɔ:m] 'the man', נִתְחַכְּמָה [ni:θḥakkaˈmɔ:] 'let us deal wisely' (Ex. 1:10).

As has been remarked, a vowel in an unstressed closed syllable was, in principle, short. If, however, it was followed by a series of contiguous consonants of relatively weak articulation (e.g. /ʔ/, /h/, /ʕ/, /ḥ/, /j/, /n/, /l/), then the vowel was sometimes lengthened even when not stressed. This occurred in certain prefixes of the verbs היה and חיה, namely the [i] of prefixes before [h]/[ḥ], e.g. יִהְיֶה [jiːhˈjɛ:] 'he will be', and the [a] of the conjunctive prefix [vaˌ] before [j], e.g. וַיְהִי [va:jhi:] 'and it was'. It is occasionally found elsewhere, e.g. הֲשָׁמַע עָם [haˈʃɔ:ma:ʕ ˈʔɔ:m] 'did any people hear?' (Deut. 4:33), שְׁמַע-נָא [ʃama: nɔ:] 'listen' (I Sam. 28:22), וּפְתַחְיָה [ufθa:ḥˈjɔ:] (Neh. 11:24).

The duration of long vowels varied considerably. From the medieval sources we are able to infer the existence of several different degrees in the relative duration of long vowels. Most of these were conditioned by differences in stress, vowel height or consonantal strength. We shall mention here some of the conditions of these variations that are known in the present state of research.[91] This list does not include all the variations that we have evidence for. There were likely to have been, moreover, a number of other variations for which we have no evidence from the extant sources.

1. Stressed long vowels were longer than unstressed long vowels, e.g., in the word הַהוּא [ha:ˈhu:] 'that' the [u:] was longer than the [a:].
2. A long vowel with secondary stress was longer than a long vowel in an unstressed syllable, e.g. in the word הָאָדָם [hɔ:ʔɔ:ˈðɔ:m] 'the man' the second [ɔ:] was shorter than the other two.
3. A close vowel [i, u] in a closed syllable with secondary stress marked by minor *gaʿya* was shorter than an open vowel [a] in the same conditions, e.g. in the words נִתְחַכְּמָה [ni:θḥakkaˈmɔ:] 'let us deal wisely' (Ex. 1:10) and וַתִּצְפְּנֵהוּ [va:ttispaˈne:hu:] 'and she hid him' (Ex. 2:2), the [i:] vowel of the first was shorter than the [a:] vowel of the second.

[90] The medieval sources that refer to the silence of the *šewa* in this context are discussed in G. Khan, 'Vowel length and syllable structure in the Tiberian tradition of Biblical Hebrew', *JSS* XXXII (1987), 54-55.

[91] For the evidence for these variations see G. Khan, 'Vowel length and syllable structure in the Tiberian tradition of Biblical Hebrew', *JSS* XXXII (1987), 23-82, idem, 'The pronunciation of -מָה before *dageš* in the medieval Tiberian Hebrew reading tradition', *JSS* XXXIV (1989), 433-441, and idem, 'The pronunciation of the verbs היה and חיה in the Tiberian tradition of Biblical Hebrew', in G. Goldenberg and S. Raz (eds.), *Semitic and Cushitic Studies*, Wiesbaden 1994, 133-144.

4. The close vowel [i] of prefixes of the verbs הִיה and חִיה was shorter than the open vowel [a] in prefixes of these verbs, e.g. in the words יִהְיֶה [ji:hjɛ:] and וַיְהִי [va:jhi:] the [i:] of the first was shorter than the [a:] of the second.
5. The close vowel [i:] of the prefixes of the verbs הִיה and חִיה was shorter than [i:] in a stressed syllable or an unstressed open syllable but longer than [i:] in a closed syllable with secondary stress marked by minor *gaʿya*; e.g. in the words אִם [ʔi:m], יִהְיֶה [ji:hjɛ:] and נִתְחַכְּמָה [ni:θḥakkaˈmɔ:] the three [i:] vowels were of decreasing degrees of length.
6. The [a:] vowel in prefixes of the verbs הִיה and חִיה (e.g. וַיְהִי [va:jhi:]) and other words before two weak consonants (e.g. הֲשָׁמַע עָם [haʃɔ:ma:ʕ ʕɔ:m] 'did any people hear?' (Deut. 4:33) was longer than an [a:] vowel in a closed syllable with secondary stress marked by minor *gaʿya* (e.g. in וַתְּצַפְּנֵהוּ [va:ttiṣpaˈne:hu:] 'and she hid him').

Syllable structure and the *šewa*

In the Tiberian pronunciation tradition many short vowels represented by the *šewa* sign or one of the *ḥaṭep* signs occurred in open syllables, e.g. יִשְׁמְרוּ [jiʃmaˈʀu:], יַעֲשֶׂה [ja:ʕaˈse:]. From the Masoretic sources and Judaeo-Arabic texts with Tiberian vocalization we know that these vowels were equivalent in length to short vowels in unstressed closed syllables.[92] Does the occurrence of these short vowels in apparently open syllables contradict the vowel length principle stated above?

According to the medieval Masoretic sources, a consonant with one of these vowels did not constitute a syllable. In a word such as תִּסְפְּרוּ the syllable structure would be, according to the medieval sources, [tis-paʀu:]. This concept of the syllable reflects the phonotactic rules of Tiberian Hebrew and corresponds to the phonotactic definition of syllables espoused in modern times by linguists such as E. Pulgram.[93] The basic principle of Pulgram's definition is that a sequence of consonant and vowel segments has the status of a syllable only if the onset of the sequence can stand in word-initial position and the coda (i.e. closure) can stand in word-final position. There is no structural reason why it cannot stand by itself as a word. In the medieval Tiberian reading tradition of Biblical Hebrew a short vowel did not occur in word-final position.[94] According to this definition, therefore, the sequence consonant + short (CV) vowel did not have the status of a syllable. Only consonants and long vowels could occur in word-final position and so only these could constitute permissible codas of syllables. The sequence CV occurred in word-initial position. It could, therefore, form the onset of a syllable. This allowed it to be attached to the beginning of a sequence which had a permissible coda and so had the status of a

[92] See G. Khan, 'Vowel length and syllable structure', 37-39, idem 'The function of the *shewa* sign in Judaeo-Arabic texts' in J. Blau and S.C. Reif eds., *Genizah research after ninety years: The case of Judaeo-Arabic,* Cambridge, 1992, 105-111.

[93] *Syllable, word, nexus, cursus,* The Hague – Paris, 1970, 40ff.

[94] The only possible exceptions are words ending in a consonantal cluster such as וַיִּשְׁק 'and he watered', נֵרְד 'nard'. Some medieval sources state that the second *šewa* in these words was vocalic (e.g. David Qimḥi, *Hebrew Grammar (Mikhlol) systematically presented and critically annotated by W. Chomsky,* New York, 1952, 16-17). Most sources, however, state that both *šewa* were quiescent (e.g. Ibn Janāḥ, *Risālat al-taqrīb w-al-tashīl*, ed. J. and H. Derenbourg, in *Opuscules et traités d'Abou'l-Walīd Merwan Ibn Djanah*, Paris, 1880, 275, Abraham ibn Ezra, *Seper ha-Moznayim*, ed. W. Heidenheim, Offenbach, 1791, 3).

syllable, viz. CV+CVC or CV+CV̄. The sequences CVCVC and CVCV̄, therefore, were regarded by the Masoretes as single syllables.

Rather than denying the status of syllable completely to a CV sequence on the basis of this phonotactic definition, it is helpful to distinguish between principal and dependent syllables. Principal syllables are those that can stand independently, since they have onsets and codas that can open or close an independent word. A dependent syllable is one that cannot stand independently, but only in combination with a following principal syllable. The aforementioned distribution of vowel length, therefore, refers to principal syllables. Any open syllable with a short vowel must be a dependent syllable. This is a phonotactic distinction. It is not usually taken account of by the accent system of Tiberian Hebrew, which counts beats on syllable nuclei between accents without distinguishing between dependent and principal syllables.

The reality of the phonotactic distinction between dependent and principal syllables is reflected by the concept of the syllable that is expressed in the medieval Masoretic literature. It is reflected also by the vocalization system, which represents the vowel nuclei of dependent syllables with signs (*šewa* and *ḥaṭepim*) that are different from those representing the nuclei of principal syllables. Furthermore some features of Tiberian Hebrew phonology are sensitive to the distinction. The occurrence pattern of the allophones of Tiberian *reš* is a clear example of this. The apico-alveolar allophone of *reš*, i.e. [r], occurred when (a) it was preceded by one of the dental/alveolar consonants דזטסצתלן or followed by לן and (b) when the *reš* or one of these alveolar letters had *šewa* or when *reš* occurred at the end of the word, e.g. דַּרְכְּמוֹנִים [darkəmoːˈnim] 'drachmas', וָאֶזְרֵם [vɔːʔezˈreːm] 'and I winnowed them' (Jer. 15:7), בְּמִזְרֶה [bəmizˈrɛː] 'with a pitch fork' (Jer. 15:7), צְרוּפָה [ṣəruːˈfɔː] 'smelted', לְמָטַר [ləmˈtaːr] 'through the rain'. When the dental/alveolar was followed by a full vowel the *reš* was realized with the uvular allophone [ʀ], e.g. in תָּרוּץ [tɔːˈʀuːṣ]. How did words such as לְמָטַר [ləmˈtaːr] and צְרוּפָה [ṣəruːˈfɔː] differ from תָּרוּץ [tɔːˈʀuːṣ]? The most obvious answer is that in לְמָטַר and צְרוּפָה the *reš* was in the same syllable as the dental/alveolar, whereas in תָּרוּץ it was in a different syllable.

We may, therefore, elaborate the description of the contexts for the occurrence of a long vowel as follows: *A vowel is long if it occurs in a stressed syllable or in an open principal syllable.*

In principle there were no phonological oppositions between vocalic *šewa* or vowels marked with *ḥaṭep* signs on the one hand and silent *šewa* (i.e. zero) on the other.[95] Vocalic *šewa*, therefore, can be regarded as an allophone of zero. It is no doubt for

[95] There are some apparent exceptions, e.g. שְׁתֵּי 'two' vs. שְׁתֵּה 'drink', יַעְקֹב 'he supplants' (Jer. 9:3) vs. יַעֲקֹב 'Jacob'. With regard to the first pair, the Masoretic sources state that all the Tiberian Masoretes pronounced שְׁתֵּי with a prosthetic vowel אִשְׁתֵּי (see the treatise on the *šewa* ed. K. Levy, *Zur masoretischen Grammatik,* Stuttgart, 1936, ח-י). So this would not be a minimal pair. The differentiation in the pronunciation of the form יעקב when used as a verb and when used as a proper name seems to be the result of an artificial attempt to express semantic distinction. One may compare, for instance, the use of the variant segolate forms of the word טעם 'decree', viz. טַעַם and טָעֵם, in the Aramaic of Ezra 6:14 to distinguish between the decree of God and the decree of a king. In Biblical Aramaic these two variant forms of segolate nouns do not in principle form semantic contrasts; cf. צֶלֶם and צֶלֶם 'image'.

this reason that the Masoretes did not consider vocalic *šewa* to be a vowel and represented it with the same sign as they represented zero. A word such as שְׁבוּ [ʃaˈvuː] 'sit! (pl.)', therefore, should be represented phonologically as /ʃbu/. There are phonological oppositions, on the other hand, between *šewa* (i.e. /Ø/) and a vowel represented with a vowel sign, e.g. שְׁבוּ [šaˈvuː] 'sit' vs. שָׁבוּ [šoːˈvuː] 'they captured'.

In the Tiberian reading tradition vocalic *šewa* was usually pronounced with the quality of *patah*. This is recorded in early masoretico-grammatical treatises, where it is stated that this pronunciation was the norm. Where, however, *šewa* preceded a guttural consonant it took the quality of the vowel on the guttural and where it preceded *yod* it had the quality of a short *i*,[96] e.g. בְּאֵר [beˈʔeːʀ] 'well', מְאוֹד [moˈʔoːð] 'very', בְּיוֹם [biˈjoːm] 'on the day'. In places the Masoretes considered that the reader may have been uncertain whether to pronounce the *šewa* as vocalic or may have been unsure about the pronunciation of *šewa* where its quality differed from the norm. In these circumstances the Masoretes added a vowel sign to the *šewa* sign, thus creating the composite *ḥaṭep* sign. The *ḥaṭep* signs were marked mainly under the guttural letters, where the pronunciation of the *šewa* was less predictable than under other letters. For instance, there were largely unpredictable variations between silent and vocalic *šewa* in verbal forms, e.g. אֶהְפּוֹךְ (Zeph. 3:9) vs. נַהֲפוֹךְ (Est. 9:1), וַיַּחְבְּשׁוּ (I Kings 13:13) vs. וַיַּחֲבֹשׁ (Gen. 22:3). Also, *šewa* on a guttural retained the qualitiy of [a] even if it preceded a guttural that was followed by a vowel of a different quality, e.g. יִמְחֲאוּ (Ps. 98:8). The qualitiy of the *šewa* here, therefore, deviated from the general rule. The marking of the *ḥaṭep* sign under the gutturals was fixed in the Tiberian Masoretic tradition and the Tiberian model codices do not exhibit significant differences. The marking of these signs under the non-gutturals, however, was not fixed and considerable differences are found in the manuscripts.

Some scholars have claimed that the quality of the *ḥaṭep* vowels was phonemic on the basis of pairs such as אֲנִיָּה 'mourning' vs. אֳנִיָּה 'ship', חֲלִי 'ornament' vs. חֳלִי 'illness', עֲלִי 'go up' (f.s.) vs. עֳלִי 'pestle'.[97] If this was the case they could not be interpreted as allophones of zero. It will be shown below, however, that the validity of these minimal pairs is doubtful.

Although vowel length is in general predictable from the syllabic context, it would appear that the syllable structure was determined by the length of the vowels. This is because a sequence containing vowels of unspecified length could have been syllabified in various ways. e.g. *tisparu* could be [tis-paː-ʀuː] or [tis-paʀuː]. The correct syllabification [tis-paʀuː] could only have been achieved if the length of the vowels had already been fixed.

The length of vowels in the Tiberian pronunciation tradition was determined by the earlier history of the language or by phonetic processes that were operative during the masoretic period. Some long vowels were originally long, e.g. כֹּהֵן [koːˈheːn] < **kāhin*. Others were lengthened through phonetic processes that took place at vari-

[96] S. Baer and H.L. Strack (eds.), *Die Dikduke Ha-Teʿamim des Aharon ben Moscheh ben Ascher,* Leipzig, 1879, 12-15; Yeivin, *Indroduction to the Tiberian Masorah,* 281-82.

[97] Cf. J. Cantineau, 'Essai d'une phonologie de l'hébreu biblique', *Bulletin de la Société Linguistique de Paris* XLVI (1950), 114-116, I. Garbell, *Lĕšonénu* XXIII (1958-59), 154.

ous periods, e.g. lengthening of a vowel in an open syllable before the stress (pretonic lengthening), e.g. יָקוּם [jɔ:ˈqu:m] < **ya'qūm*; the lengthening of stressed vowels, e.g. מִדְבָּר [miðˈbɔ:ʀ] < **mid'bar*; the lengthening of vowels as compensation for the loss or absence of gemination in the following consonant, e.g. יְבָרֵךְ [javɔ:ˈʀe:χ] < **yabarrik*, הַהוּא [ha:hu:] < **hahhū*. Most of the phonetic processes had ceased to operate by the time of the Tiberian Masoretes. For instance, pretonic short vowels in open syllables were not lengthened ([tispaˈʀu:] did not shift to [tispa:ˈʀu:]). In such cases, and also in the case of originally long vowels, vowel length is an inherited feature of the language. Some phonetic processes seem to have been still active in the masoretic period. One such process is the general lengthening of all stressed vowels. We know this was a relatively late process.[98]

As a result of the historical background of the Tiberian pronunciation tradition the vowels *ṣere* and *ḥolem* were always realized as long. The other vowels were realized as either long or short.

In some circumstances there appears to have been differences in duration between stressed vowels that were historically long and those that were historically short. The term 'historically long' here refers to vowels that were originally long or that were lengthened by phonetic processes that took place before the masoretic period. 'Historically short' refers to originally vowels that were lengthened by phonetic processes that took place during the masoretic period. In the Tiberian pronunciation tradition a *šewa* on a letter coming after a historically long vowel was usually silent, e.g. שׁוֹמְרִים was [šo:mʀi:m]. Such a closed syllable before the main stress could take secondary stress in the form of an accent: שׁוֹמְרִים. This implies that the vowel was long enough to accommodate the musical melisma of the accent associated with the secondary stress. Normally, the secondary stress is separated from the main stress by an unstressed, buffer syllable, or at least by a vocalic *šewa*, so that the two stress beats do not come together. In a form such as [šo:mʀi:m] it appears that the first vowel was lengthened to the extent that it included both the beat of the secondary stress and the unstressed buffer. This would mean that it contained two syllabic peaks: [šo:ŏmʀĭ:m].[99] Historically short vowels, on the other hand, could not take the secondary stress in the form of an accent, but only in the form of a minor *gaʿya*, e.g. נִתְחַכְּמָה [ni:θḥakkaˈmɔ:] < [niθḥakkaˈmɔ:]. Such cases of minor *gaʿya* rarely occur immediately before the syllable bearing the main stress since they were not long enough to accommodate both the beat and buffer in contrast to the first vowel in [šo:ŏmʀĭ:m]. The Arabic transcriptions, moreover, indicate that a vowel with the minor *gaʿya* (i.e. a historically short vowel in a closed syllable) was shorter than one that could take major *gaʿya* (i.e. the type found in syllables with a historically long vowel, e.g. הָאָדָם, שׁוֹמְרִים). This is, in fact, reflected in the terminology 'minor' and 'major' *gaʿya*, which is found in the early masoretic literature.

A vocalic *šewa*, which was a historically short vowel, was sometimes lengthened by secondary stress marked by *gaʿya*, e.g. בְּנַחֲלָה [ba:na:ḥaˈlɔ:] < [banaːḥaˈlɔ:] 'as an inheritance' (Josh. 13:6). There is evidence that also these vowels were not as long

[98] See Khan, 'Vowel length and syllable structure', 'The historical background of the vowel *ṣere* in some Hebrew verbal and nominal forms', *BSOAS* LVII (1994), 133-44.

[99] See Khan, 'Vowel length and syllable structure', 50-54.

as a historically long vowel in an open syllable with *gaʿya*, e.g. הָאָדָם [hɔ:-ʔɔ:ˈðɔ:m].[100]

The analysis of the historically long vowel in a closed syllable with secondary stress as having two peaks has implications for the phonemic status of *qameṣ*. It was remarked above that pairs such as אָכְלָה [ʔɔχˈlɔ:] vs. אָכְלָה [ʔɔ:χˈlɔ] seem to require us to identify short and long *qameṣ* as two separate phonemes. If the syllable structure of the second word is in fact [ʔɔ:χˈlɔ:] then this would not be a minimal pair for the length of *qameṣ*.

It appears that there was a certain amount of ambiguity concerning the syllabic status of vocalic *šewa* with *gaʿya*. Some masoretic sources treat such as *šewa* as a full vowel and in some manuscripts the *šewa* sign is replaced by a vowel sign.[101] Other passages in the masoretic literature, however, reflect the perception that the addition of *gaʿya* to a *šewa* did not transform it into a full vowel.[102] In the model Tiberian manuscript codices, moreover, the *šewa* sign is retained when there is an accompanying *gaʿya*.[103] A principal open syllablee with a long vowel was treated differently by secondary stress from a dependent open syllable. The vowel of the former was longer than the vowel of the latter not only when unstressed but also when taking the secondary stress. This is reflected by the occurrence of major *gaʿya* in the principal syllable but not in the dependent syllable. The *gaʿya* on the *šewa* in בְּנַחֲלָה [ba:na:ḥalɔ:] (Josh. 13:6) was treated differently in the masoretic sources from a *gaʿya* such as in הָאָדָם [hɔ:ʔɔ:ˈðɔ:m], which was termed a 'major' *gaʿya*, due to the greater lengthening of the vowel. For this reason there was a certain ambiguity in the Masoretic tradition as to whether vocalic *šewa* with the secondary stress was equivalent to a full vowel.

There was also ambiguity in the syllabic status of some vowels represented by *ḥaṭep* signs on non-guttural consonants, notably *ḥaṭep qameṣ* in words such as דֳּמִי 'silence', צֳרִי 'balsam', צִפֳּרִים 'birds', כָּתֳּנֹת 'tunics' (Ex. 28:40), הַגָּרְנוֹת 'the threshing floors' (Joel 2:24). The *ḥaṭep qameṣ* sign (pronounced [ɔ]) in these words is the reflex of an originally short [o] or [u]. The syllable with the *ḥaṭep qameṣ* sign sometimes takes secondary stress, which is often marked by a *gaʿya* sign, and the *ḥaṭep* sign is replaced by an ordinary *qameṣ* in the model Tiberian manuscripts. This is a major *gaʿya*, as is shown by its patterns of occurrence. It is found, when the syllable in question is separated from the main stress by another syllable: קָדְשִׁים, שָׁרְשָׁיו. This differs form the occurrence of secondary stress marked by *gaʿya* on a vocalic *šewa* or *ḥaṭep* sign on a guttural, which are not replaced by full vowel signs in the model Tiberian manuscripts.

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[100] See G. Khan, 'The pronunciation of *šewa* with *gaʿya* in the Tiberian tradition of Biblical Hebrew', to appear in *VT*.

[101] Cf. I. Yeivin, 'Marking of *shewa-gaʿya* in Biblical manuscripts' [in Hebrew], in M. Bar Asher *et al.* eds., *Hebrew and Arabic studies in honour of Joshua Blau,* Tel-Aviv – Jerusalem, 1993, 342.

[102] See Khan, 'The pronunciation of *šewa* with *gaʿya* in the Tiberian tradition of Biblical Hebrew', to appear in *VT*.

[103] There are a few marginal exceptions; cf. I. Yeivin, *The Aleppo codex of the Bible. A study of its vocalization and accentuation,* Jerusalem, 1968, 18.

It has been remarked that a characteristic feature of long vowels in principal syllables is that they were lengthened by secondary stress sufficiently to take major *gaʿya*. In this respect, therefore, the aforementioned type of short vowels marked with *ḥaṭeṗ qameṣ* were equivalent to long vowels in an open principal syllable.

Moreover, the writing of ordinary *qameṣ* in place of *ḥaṭeṗ qameṣ* is found in some model Tiberian manuscripts also in a pretonic syllable, e.g. I. Firkovitch B10: צָרִי (Gen. 43:11, most MSS have צְרִי), קָדְקָדֶךָ (Deut. 28:35, most MSS have קָדְקֳדֶךָ), יְהֹדָפֻנּוּ (Num. 35:20, most MSS have יְהֳדָפֻנּוּ); MS I Firkovitch B19a: יְהֹדָפֻנּוּ (Num. 35:20), יְנָפֻנּוּ (I Sam. 26:10, most MSS have יְנֳפֻנּוּ).

Ibn Janāḥ refers to the vocalic *šewa* being 'lighter' than *ḥaṭeṗ qameṣ* in such words. This implies that there was a difference in length. According to Saadya Gaon, the rules for the occurrence of the apico-alveolar allophone of the Tiberian *reš* treat the word צָרִי as having two syllables.[104] As we have seen, these rules treat a consonant with vocalic *šewa* as belonging to the following syllable.

There is reason to believe, therefore, that in words such as צָרִי, דָמִי the *ḥaṭeṗ qameṣ* vowel was longer than a vocalic *šewa*. This applies both to cases where the syllable was unstressed and those in which it had secondary stress. This difference in length was sufficient to give the consonant + vowel sequence the status of a independent syllable as reflected by the rules for the Tiberian *reš*. We may describe these vowels as half long (CV·), lying in between short vowels (CV) and long vowels (CV:). It appears that a half long vowel could act as a coda of a principal syllable whereas a short vowel could not.

There is evidence that the half-long vowel in unstressed syllables was vulnerable to shortening. This is reflected by differences in vocalization between various Tiberian Masoretes. With regard to some words with *ḥaṭeṗ qameṣ* on a non-guttural consonant it is recorded that a number of Masoretes read them with *ḥaṭeṗ paṭaḥ*. This applies to the words יְרַדְפֶךָ (Ezek. 35:6) and אֶכְתֳּבֶנָּה (Jer. 31:33). The reading with *ḥaṭeṗ qameṣ* is attributed to the conservative tradition of Ben Ašer, whereas the reading with *ḥaṭeṗ paṭaḥ* (אֶכְתַּבֶנָּה, יְרַדְפֶךָ) is said to be that of the less conservative school of Ben Naphtali.[105] The reading with *ḥaṭeṗ paṭaḥ* was equivalent to

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[104] Ibn Janāḥ, ed. Joseph Derenbourg, Paris, 1886, 323, Commentary on *Seper Yeṣira*, ed. Mayer Lambert, 79.

[105] The sources referring to the differences between Ben Ašer and Ben Naphtali are: MS Harley 1528 of the British Library; cf. L. Lipschütz ed., *Kitāb al-Ḵilaf: Mishael Ben Uzziel's treatise on the differences between Ben Asher and Ben Naphtali*, Jerusalem, 1965, 27, לה, לג; Ibn Janāḥ, *Kitāb al-luma*ʿ, ed. Derenbourg, 149; David Qimḥi, *Miḵlol*, ed. Lyck, 1862, 17b, *Šorašim, s.v.* כתב, רדף. A difference between Pinḥas and Moše Moḥe appears in MS Tschufut Kale Paper 1; cf. *Diqduqe ha-Teʿamim*, ed. Baer and Strack, 84: מחלפ ירדפך וחביר תרויהון לרב פינ ורב משׁ פתׁ דּ 'There is a difference, R. Pinḥas vocalizes יְרַדְפֶךָ in both occurrences of this word (Ezek. 35:6) whereas R. Moše (Moḥe) vocalizes with (*ḥaṭeṗ*) *paṭaḥ*'. Moše Moḥe and Pinḥas belong to an earlier generation of Masoretes than Ben Ašer and Ben Naphtali; cf. I. Yeivin, 'From the teachings of the Masoretes', *Textus* IX (1981), p. כג, יט-כ. A. Dotan dates Pinḥas to the middle of the ninth century A.D. (*The Diqduqé HaṬṬeʿamim of Ahăron ben Moše ben Ašér*; Jerusalem 1967, 303, 305). Aharon ben Moše ben Ašer and Ben Naphtali were active in the first half of the tenth century.

a vocalic *šewa*, which had the same quality, and reflects the shortening of the vowel and the levelling of its quality.

If the *ḥaṭep qameṣ* was a principal syllable nucleus then the long and short *qameṣ* in minimal pairs such as דָּמִי 'silence' and דָמִי 'my blood' would have to be identified as separate phonemes, since vowel length was the only feature that contrasted: [dɔ·m:] and [dɔ:-mi:]. Since the phonemic contrast was between only two degrees of length the phonemes could be represented as short /ɔ̆/ vs. long /ɔ:/.

It cannot be excluded that this applied in general to cases of *ḥaṭep* vowels that had not been levelled to the normal quality of *šewa* but had a quality close to that of the original short vowel from which they had developed. We do not have any direct evidence for this, but if it is correct the validity of the pairs חֲלִי/חֳלִי, אֲנִיָּה/אֳנִיָּה, עֲלִי/עֳלִי as proof for phonemic contrasts in the quality of *ḥaṭep* vowels would be in doubt, since the two members of each pair would have had a different syllable structure. The words with *ḥaṭep qameṣ* and *ḥaṭep segol* had a quality close to that of the original vowel: אֳנִיָּה [ʔɔ·-nij-ˈjɔ:] < * ʾ*oniyyā* (cf. the Babylonian tradition of Hebrew: אֹנִיָּה [ʔonijˈjɔ:][106]) vs. אֲנִיָּה [ʔanij-ˈjɔ:] 'mourning', חֳלִי [ḥɔ·-ˈli:] 'illness' < **ḥuly* (cf. Babylonian: ḫulˈliː[107]) vs. חֲלִי [ḥaˈli:] 'ornament', עֳלִי [ʕɛ·-ˈli:] 'pestle' < * ʿ*ily* (cf. Babylonian ʿilˈliː[108]) vs. עֲלִי [ʕaˈli:] 'go up! (f.s.)'.

Summary of the phoneme inventory with the known allophones.

Labials

/b/ [b], [v]
/m/ [m]
/p/ [pʰ], [f], [p̪]
/w/ [v], [w]

Dentals/alveolars

/t/ [tʰ], [θ]
/d/ [d], [ð], [ð̪]
/ṭ/ [ṭ]
/s/ [s]
/z/ [z], [z̪] (?)
/ṣ/ [ṣ], [z̪]
/š/ [ʃ]
/n/ [n]
/l/ [l]

Palatal

/j/ [j], [ɟ]

[106] See I. Yeivin, *The Hebrew language tradition as reflected in the Babylonian vocalization*, Jerusalem, 1985, 879.

[107] Yeivin, *Babylonian vocalization*, 878.

[108] Yeivin, *Babylonian vocalization*, 876.

Velars and uvular

/k/ [k^h], [χ]
/g/ [g], [ɣ]
/q/ [q]
/R/ [ʀ]/[ɣ], [ɾ]

Laryngals and Pharyngals

/h/ [h]
/ʔ/ [ʔ]
/ḥ/ [ḥ]
/ʕ̣/ [ʕ̣]

Vowels (in the following phonemic notation /V/ is a phoneme unspecified for length, /V̆/ and /V:/ are phonemes which contain length as a component feature).

/a/ [a], [aː], [ɑ], [ɑː]
/ɛ/ [ɛ], [ɛː]
/ɔ̆/ (?) [ɔ], [ɔˑ]
/ɔ:/ (?) [ɔː]
/e/ [eː]
/o/ [oː]
/u/ [u], [uː]
/i/ [i], [uː]
/ø/ [ø], [a], [ɛ], [ɔ], [e], [o], [i], [u]

Abstract:

The Tiberian pronunciation tradition of Biblical Hebrew is the pronunciation which the Tiberian vocalization system was created to represent. This pronunciation is now extinct but can be reconstructed from various medieval sources. The most important of these sources include (1) Masoretic and grammatical texts, (2) transcriptions of Biblical Hebrew into Arabic script and (3) the use of Tiberian vocalization in texts written in Judaeo-Arabic. This article presents the main features of Tiberian pronunciation according to the aforementioned sources. It concentrates on a description of the phonetic realization of the consonants and vowels. Some problems of phonemic analysis are also discussed.

Address of the author:
Dr. G. Khan, University of Cambridge, Faculty of Oriental Studies, Sidgwick Avenue, Cambridge CB3 9DA, England