Points of Contact
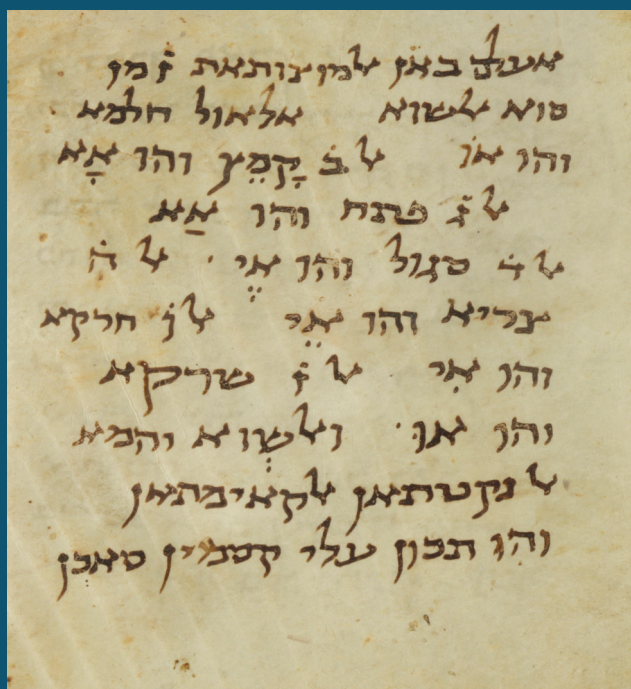
The Shared Intellectual History of Vocalisation in Syriac, Arabic, and Hebrew

NICK POSEGAY

Cover image: MS Cambridge University Library, Taylor-Schechter Arabic 53.1 (anonymous Masoretic treatise on vowels and accents). Courtesy of the Syndics of the Cambridge University Library.

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3. EARLY RELATIVE VOWEL PHONOLOGY

With respect to the position of the points also, every man takes authority to himself to place them as he pleases. (Jacob of Edessa [d. 708], *Letter on Orthography to the Scribes* [trans. Phillips 1869, 8])

Prior to the spread of Arabic as the dominant language in the Middle East, both Syriac grammarians and Hebrew Masoretes arranged vowels according to a relative system, classifying each one based on its relationship to other vowels. They determined these comparative relations by observing the physical processes of articulation, especially noting the amount that the mouth opens when pronouncing each vowel and whether a vowel is articulated from the back or the front of the mouth. To some extent, the two traditions also share terminology connected to their relative vowel systems in the form of *milleᶜel/men lᶜel* (above) and *milleraᶜ/men ltaḥt* (below) phonetic designations. These ideas connected positional 'height' within the mouth to vowel phonology and informed the placement of the dots in the Syriac and Tiberian Hebrew vocalisation systems.[1] These relative principles most likely began as pedagogical aides used to help new readers master the proper pronunciation of Syriac and Hebrew vowels.

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[1] A connection of this sort between the Syriac and Hebrew vowel points has been argued (for and against) in various forms since the 1880s (see, for example, Graetz 1881a; 1881b; Blake 1940; Morag 1961, 17–19; Dotan 1974; 2007, 613; Posegay 2020, 193–202; 2021d).

By the ninth century, both Syriac and Hebrew scholars shifted away from this mindset and reapplied their relative comparisons to develop absolute terms that could designate discrete vowels on a one-to-one basis.

The Arabic traditions of Qurʾānic recitation emerged in the context of these relative vowel systems that Syriac priests and Hebrew Masoretes used to teach and record biblical recitation. In these biblical traditions, contrastive terms like *pɔtaḥ* 'opening' and *qɔmeṣ* 'closing' compared homographs based on relative openness, while terms like *men lʿel* 'above' and *men ltaḥt* 'below' compared backness. Some Arabic vowel names do designate openness (e.g., *fatḥ, ḍamm*), but there is also an early pair that contrasted allophonic variants of ʾ*alif* using 'height' as a measure of phonetic backness: ʾ*imāla* 'bending down, inclining' and *naṣb* 'standing upright'. The earliest explanations of these terms reveal that, like in Syriac and Hebrew, early Arabic vowel phonology included a two-way relative system that did not assign specific names to each vowel sound. However, due to the smaller vowel inventory in Arabic as compared to Hebrew and Syriac, Arabic grammarians developed their absolute vowel naming system without significant expansions to this relative terminology.

1.0. The Hebrew-Syriac Connection

The Syriac and Hebrew theories of relative vocalisation depend on comparisons between different amounts of phonetic openness and backness during the pronunciation of vowels. These principles appear in the grammatical work of Jacob of Edessa (d. 708), most notably in his tractate *On Persons and Tenses* (Phillips 1869,

13–33, ܒܓ–ܕܬ), as well as Dawid bar Pawlos' (fl. c. 770–800) frag-
mentary grammar (Gottheil 1893; Farina 2021) and his *scholion*
on *bgdkt* letters.[2] It also appears in early Masoretic homograph
lists and the terminology in the Tiberian *Masora magna* and *parva*.
Remnants of it can even be seen in Judaeo-Arabic Masoretic trea-
tises. Altogether, these sources suggest that there was contact and
intellectual exchange between Syriac grammarians and Hebrew
Masoretes sometime around the eighth century, just as they be-
gan shifting from relative to absolute vocalisation. Their shared
principles of relative vocalisation formed the basis of later pho-
nological analyses of vowels and the placement of the vowel
points in both Syriac and Hebrew.

1.1. Syriac Relative Vowel Phonology

Three works by Jacob of Edessa reveal a Syriac scribal and gram-
matical tradition on the cusp of the transition between relative
and absolute vocalisation. The first is his *Letter on Orthography* to
George of Sarug, in which he berates Syriac scribes who fail to
follow his ideas of proper orthography and diacritic pointing
(Phillips 1869, 1–12, ܐ–ܝ; see also, Farina 2018). He stresses
the importance of the Syriac diacritical dot, which could indicate
the vocalisation of a word in comparison to a homograph with

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[2] MS Jerusalem, Saint Mark's Monastery 356, ff. 164v–166r; see Do-
labani (1994) and Farina's (2021) recent edition and translation. This
manuscript is catalogued as SMMJ 356 by the Hill Museum and Manu-
script Library (https://www.vhmml.org/readingRoom/view/136521).

different vowels.[3] Jacob's frustration at the mistaken use of this dot is palpable, but his entreaty to George's community did not resolve the issue, as the diacritic dot alone could not precisely disambiguate every vowel in a given word.[4] Jacob took matters into his own hands later in his career with his third work related to vocalisation (Segal 1953, 40; Talmon 2008, 167), the Syriac grammar *Turrɔṣ Mamllɔ Nahrɔyɔ* (*The Correct Form of Mesopotamian Speech*) (Wright 1871; see also above, chapter 2, §1.0). In order to record the vowels of precise grammatical examples in this book, Jacob designed what is likely the first absolute vocalisation system in Syriac, Arabic, or Hebrew. This system utilised new letters, derived from Greek letters, to represent each Syriac vowel. Jacob insisted that they were only meant for teaching, and they never saw widespread use outside of the *Turrɔṣ Mamllɔ* (Talmon 2008, 164–66; Kiraz 2012, I:73–75).[5]

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[3] The most accessible and up-to-date explanation of this diacritic system is Kiraz (2015, 31–46). Other explanations, in descending order of readability, include: Kiraz (2012, I:12–14, 20–22), Segal (1953, 7–19), and Duval (1881, 61–67).

[4] This remained the case even as seventh-century scribes began applying the diacritic dots to individual letters (see Segal 1953, 9; Kiraz 2012, I:20, 64).

[5] The Arabic red-dot system, which is often attributed to Abū al-Aswad al-Duʾalī (d. 686/7), is also an absolute vocalisation system and may perhaps predate Jacob's vowel letters. It appears in the Qurʾān manuscripts known as Marcel 13 and the upper layer of the Sanaʿa Qurʾān, both of which were produced (though not necessarily vocalised) in the late seventh or early eighth century (Abbott 1939, 39; George 2010, 75–79). Of course, these red dots may be later additions.

Neither Jacob's letter nor his larger grammar directly addresses the Syriac relative vocalisation system, but his second text, *On Persons and Tenses*, does. This grammatical tractate was likely written around the same time as the letter to George and contains Jacob's best attempt to explain Syriac vocalisation within the bounds of the seventh-century diacritic dot system. This explanation is one of the earliest discussions of Syriac vowel phonology, predating even the 'sounding' (*qɔlɔnɔyɔtɔ*) terminology that Jacob would later adopt in his *Turrɔṣ Mamllɔ*. In its introduction, he writes:

ܘܬܠܬܐ ܗܝ ܙܒܢܐ ܐܝܬܝܗ . ܘܚܕܐ ܘܡܥܕܪܐ ܘܥܬܝܕܐ : ܘܒܢܬ ܩܠܐ ܥܒܝܢ ܘܩܛܝܢܝ ܀ ܟܘܠ
ܡܢ ܟܠ ܦܘܡ ܠܟܠܟ ܐܝܬ ܚܝܠ ܐܘ ܩܛܝܢܝܐ . ܟܐܝܟ ܡܢ ܘܚܬܐ ܐܘ ܦܬܝܐ ܟܬܝܐ ܩܠܟ
. ܐܡܬ ܡܢ ܠܚܠ ܓܥܠ ܢܩܘܬܐ ܀ ܟܝܟܐ ܡܢ ܩܛܝܢ ܐܘ ܢܩܕ ܡܢ ܠܬܚܬܐ ܀ ܐܢ
ܡܨܥܝܐ ܟܐܦܐܐ ܕܡܠܝܟܐ ܘܚܬܟܐ : ܘܐܝܬܐ ܐܚܪܢ ܐܝܟܢ ܐܝܬܝܗܐ ܕܓܥܝܢ ܠܗ
ܬܬܒܬܐ ܐܝܟܢ ܢܩܘܬܐ ܓܥܠ ܚܕ ܡܢ ܠܚܠ ܘܚܕ ܡܢ ܠܬܚܬܐ

Then the tenses are three, past, present, and future, and sounds are thick and thin. Every saying, that is, [every] form, when it is thick or wide with sound, then it takes a point above. But when it is narrow or thin, then below. If it is intermediate, between narrow and thick, and there are two other [words] written the same as it, then it takes two points, one above and one below. (Phillips 1869, ܝܒ, lines 9–16)

This passage reveals several details about Jacob's perception of vowels. He indicates that every word has 'sounds' (*bnot qɔle*)[6]—that is, one or more vowels—that differ from those of its homo-

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[6] For the interpretation of *bnot qɔle* as 'sounds', see entries on *ba(r)t qɔlɔ* in Duval (1901, 438) and Payne Smith (1903, 54).

graphs. This difference is not absolute, but rather Jacob compared the vowels of one word to those in another word according to two measures: 'thickness' and 'wideness'. Based on the examples of homographs that Jacob gives in the tractate, it seems that these metrics map approximately onto the modern linguistic concepts of phonetic 'backness' and 'openness', respectively (Kiraz 2015, 44–46; Posegay 2021d, 58–59). That is, Jacob would say that a word with more backed and open vowels is 'thick' (ʿbe) and 'wide' (pte), while its homograph with relatively fronted and closed vowels would be 'thin'[7] (nqed) and 'narrow' (qaṭṭin). Thicker, wider words were marked with a diacritic dot above, while thinner, narrower words took a dot below. If a reader were sufficiently adept at Syriac, then they could infer the vocalisation of any word based solely on the position of a diacritic dot above or below it, provided that they were familiar with its homograph. If, however, a reader had an incomplete mastery of Syriac, then the diacritic dot left some ambiguity, especially in three-way homographs. The vowel /a/, for example, was 'thicker' (more-backed) than /e/, but 'thinner' (more-fronted) than /ɔ/.[8] Thus, as Jacob mentions, Syriac scribes introduced a two-dot sign to mark

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[7] Alternatively, 'pure' or 'clear'.

[8] Knudsen points out that the rounded /ɔ/ vowel known from early medieval Syriac may not yet have been part of Jacob's vowel inventory. He may instead have pronounced the vowel which we today call zqɔpɔ (usually transcribed ɔ or ā) as an unrounded /ɑ/. Since Jacob implies that this vowel was 'wider' than /a/, I suspect that it cannot involve much lip rounding, but the exact qualities of all his vowels are not known definitively (see Kiraz 2015, 45; Knudsen 2015, 90–98, 115; Butts 2016, 89–90; Posegay 2021d, 59–61).

a word with 'intermediate' (*meṣʿɔyɔ*) vocalisation, using one supralinear dot and one sublinear dot. The key point here is that any vowel which was called *meṣʿɔyɔ* in one context could be called *qaṭṭin* or *pte* in another context.

These five words—ʿ*be* 'thick', *pte* 'wide', *nqed* 'thin', *qaṭṭin* 'narrow', and *meṣʿɔyɔ* 'intermediate'—are not names for vowels, as each one may be applied to words with different vowels depending on their homographic contexts, but they do carry phonological meaning. They also seem to come from two different sources. On one hand, ʿ*be*, *nqed*, and *meṣʿɔyɔ* are Jacob's attempt to map a triad of Greek consonantal categories onto the Syriac vowels. This adaptation of Greek phonology corresponds to the categories that Jacob would eventually use to describe consonants in the *Turrɔṣ Mamllɔ*, but it is not clear that he perceived any specific relationship between the features of those consonantal groups and the vowels (Talmon 2008, 167–69; compare Davidson 1874, 6). More likely, as a result of his affinity for Greek, Jacob was simply trying to force Greek linguistic concepts to fit the Syriac language (Wright 1871, ﬩; Revell 1972, 367; Knudsen 2015, 77–78; Farina 2018, 179–82). On the other hand, *pte* and *qaṭṭin* are likely internal Syriac developments, used to describe the relative amount of opening and closing of the mouth when pronouncing the vowels. This 'wide-and-narrow' type of comparison was fundamental to nearly all Syriac analyses of vowel phonology from this point onwards.

By the end of Jacob's lifetime, Syriac scribes were already shifting away from this relative vocalisation system with individual diacritic dots and towards an absolute vocalisation system

with unique vowel signs for every vowel quality (Segal 1953, 26–30, 41–47, 98; Kiraz 2012, I:12, 14, 20–21, 64, 70–71; 2015, 36–37, 44, 94–102). This development led to the decline of relative descriptions for vowel phonology, as each vowel and its sign was eventually assigned an individual name (see below, chapter 4, §2.0). That said, the works of Dawid bar Pawlos in the late eighth century show us that relative vocalisation was not quite dead yet. In the extant fragments of his grammatical writings, Dawid describes the physical process of articulation that results in speech:

ܘܡܬܬܐܪܝܢ ܒܝܢ ܪܘܚܐ ܒܪܝܫ ܠܫܢܐ ܕܗܘ ܠܥܠܐ ܐܝܬܘܗܝ ܡܠܝܐ ܕܡܡܠܠܟ ܘܩܢܝܢ ܢܩܫܐ
ܒܝܓܪܐ ܡܕܡ ܕܡܦܩܢܐ ܪܘܚܐ ܘܒܓ ܓܓܪܐ ܐܝܟ ܐ . ܕܘܒܒܐ ܡܕܡ ܕܪܘܚܐ ܢܦܝܚܬܐ .
ܚܒܒܢ ܡܢܐ ܘܢܝܬܐܠܐ ܐܟܘܬܐ . ܐܝܟ ܐܪ ܢܨܚܝ ܒܝܠ ܦܘܡܐ . ܘܡܕܚܢܝܢ
ܒܓ ܥܠܐ ܘܩܪܝܬ ܡܢ ܡܦܩܐ ܐܘܐܪ . ܘܓܡܠܢܪ ܠܥܠ ܪܝܫ ܕܟܡ ܕܚܡ . ܒܡܠܠ ܕܦܐܘ
ܦܪܝܣܐ ܕܢܩܫܐ ܘܡܬܚܘܒܕ . ܘܒܓ ܩܠ ܢܦܥ . ܚܢܘܫܐ ܠܥܠܡ ܕܐܝܕܘ
ܕܠܟ . ܐܪ . ܬܠܢܝܣ ܐܪܘܫܝܟ ܐܪܦ ܘ . ܟܐܘܡ ܐܗܠܥ ܐܬܚܐ ܘܐ . ܕܚܐܬ
ܐܘܫܝܟ ܪܐ ܘܐܦܘܪܝ . ܐܪܘܫܝܟ . ܘܬܟܡܬ ܕܩܠܟ ܪܠ ܕܟ ܐܪܐܬ ܐܪܗܬ ܕܟܬ .
ܘܟ ܓܠܝ ܘܡܬܚܬܚ . ܕܢܬ ܩܠܟ ܚܠܡ ܐܘܫ ܟܐ

They [the spoken utterances] are loosed with breath at the tip of the tongue, which is the key to speech, and they gain beats through some exhalation of breath, and with the throat by some buzzings of inhaled air. Hymns and melodies likewise sound out, in the air that is enclosed in the mouth, wrapped around the teeth, and pressed by the lips. And at the key [i.e., the tip] of the tongue, as is proper, by a little opening and contracting that is shown and heard, with a useful sound which is manifested for those things which the mind conceives—whether they be learned or formed of the intellect, or whether they be pure or false— and in the beats of the sounds that are without written letters, all units of human speech are fashioned and combined. (Gottheil 1893, cxii, line 6–cxiii, line 3; see also, Farina 2021)

As discussed above (chapter 2, §1.0), Dawid views 'beats' (*nqɔshɔtɔ*, sing. *nqɔshtɔ*) as the basic unit of poetic metre, and the only letters which can comprise a beat, in and of themselves, are the 'sounding letters' (*ʾatwɔtɔ qɔlɔnɔyɔtɔ*). Since every beat of poetry contains a vowel, a reader can identify the number of beats in a metre by counting the vowels, and thus the term *nqɔshtɔ* could be rendered as either 'beat' or 'vowel' (see Segal 1953, 7, 54, 171). With this in mind, the above passage explains how vowels are necessary to speech, including in 'hymns' (*qinɔtɔ*) and 'melodies' (*neʿmɔtɔ*). The final statement about "the beats of the sounds that are without written letters" is unambiguous: in the medieval Syriac writing system, the only sounds without written letters are the vowels. In this context, Dawid's use of the words 'opening' (*pɔtaḥ*) and 'contracting' (*ʾɔsar*) as articulatory actions is significant for vocalisation. These words would seem to indicate the movement of the lips during articulation, and just as we saw with Jacob of Edessa's 'wide' (*pte*) and 'narrow' (*qaṭṭin*) comparisons, they present a two-way phonetic contrast based on openness. While Dawid's contrastive word choice in this passage may imply a link between him and Jacob of Edessa, it is not definitive confirmation that he employed relative phonology to describe Syriac vowels.

More conclusive evidence of relative terminology appears in Dawid's *scholion*, in which he explains the changes in the realisation of the *bgdkt* letters in different contexts. Until recently, this *scholion* was only extant in unpublished manuscripts held in Middle Eastern libraries. I transcribed the following quotations

by comparing MS SMMJ 356 from St. Mark's Monastery in Jerusalem with MS ZFRN 192 from Dayr al-Zaʿfarān in Mardin.[9] The text begins with a heading, reading "The Scholion on Changeable Letters by Dawid bar Pawlos (ܩܦܠܐܘܢ ܕܥܠ ܐܬܘܬܐ ܡܫܬܚܠܦܢܝܬܐ ܕܕܘܝܕ ܒܪ ܦܘܠܘܣ)", and then:

ܕܥܠ ܐܬܘܬܐ ܕܡܬܩܪܝܢ ܡܫܬܚܠܦܢܝܬܐ ܀ ܗܢܝܢ ܡܬܪܟܟܢ ܘܡܬܩܫܝܢ
ܕܟܬܒܝܬܗܘܢ ܡܢܗܝܢ ܀ ܐܦ ܕܥܬܝܕܐ ܥܠܝܗܘܢ ܕܫܡܗܐ ܐܬ ܚܢܐ ܠܣܘܪܝܝܐ
ܕܢܬܪܟܢ ܠܗܝܢ ܀ ܗܢܘ ܕܝܢ ܒܬܪ ܐܠܦ ܐܝܢܐ ܕܐܝܬ ܚܪܬܐ ܕܫܡܐ ܩܕܡ ܗܘ
ܐܬܘܬܐ ܐܘ ܡܬܪܟܟܢ ܀ ܘܒܬܪ ܘܘ ܚܡܝܩܐ ܘܝܘܕ ܕܚܝܩܐ ܀ ܐܘ ܘܘ ܡܬܦܬܚܐ ܀
ܘܒܬܪ ܝܘܕ ܐܘ ܕܦܬܝܚܐ ܗܘܐ ܕܠܐ ܡܬܪܟܟܐ ܀ ܗܠܝܢ ܡܫܬܚܠܦܢܝܬܐ ܕܝܢ ܗܠܝܢ
܀ ܕܠܬ ܕܩܕܡ ܫܡܐ ܀ ܘ ܓܡܠ ܒܝܬ ܬܘ ܘܟܦ ܀ ܗܠܝܢ ܡܬܪܟܟܢ ܘܡܬܩܫܝܢ
ܒܐܬܘܬܐ ܕܡܬܩܕܡܝܢ ܀

Regarding the letters which are called 'changeable': they are softened and hardened according to what precedes. Also, when what precedes them are nouns, it is customary for the Syrians that they be softened. Thus, after an ʾ*alaph* that is the end of a noun which precedes the letters, they may be softened or hardened; and after a constrained *waw*, a pressed *yod*, or an opened *waw*. But an opened *yod* is such that [the letter] is not softened. These are [the changeable letters]: *dalat* which is before a noun, *gamal, bet, taw*, and *kaph*. They are softened or hardened by the letters which precede them. (ZFRN 192 f. 199r, lines 11–18)

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9 See MS Jerusalem, St. Mark's Monastery (SMMJ) 356, ff. 164v–166r and MS Mardin, Dayr al-Zaʿfarān (ZFRN) 192, ff. 199r–200r. Both manuscripts are digitised in the Hill Museum and Manuscript Library's virtual reading room (https://www.vhmml.org/readingRoom/, accessed 24 November 2020). See now the recent edition of Farina (2021), which was unavailable before this book went to print.

While Dawid was certainly a Miaphysite, he spent most of his life near Mosul on the Eastern fringe of 'West' Syriac territory (Rahmani 1904, 67–69; Baumstark 1922, 272; Barsoum 1987, 325–29; Moosa 2003, 272–76; Brock 2011), and he seems to describe a more typically 'Eastern' pronunciation system here. He recognises only five Syriac stops that may become fricativised (ܓ ܕ ܒ ܬ ܟ), excepting *pe'* in contrast to the six Western *bgdkpt* consonants (see Nöldeke 1904, §23; Robinson and Coakley 2013, 11, 147; Knudsen 2015, 47). However, he also notes that fricativisation can occur in an initial *bgdkt* letter of a word following the final *'alaph* of a separate noun. This phenomenon of fricativisation across word boundaries is observed mainly in West Syriac (Knudsen 2015, 42, 51). Either way, what concerns us here is Dawid's description of the letters that cause the *bgdkt* letters to become 'softened' (*metrakkak*). Besides the *mater lectionis* letter *'alaph*, which usually represents /ɔ/ or /e/ at the end of a word, Dawid includes *waw 'ṣiṣtɔ* 'constrained *waw*' and *yod ḥbiṣtɔ* 'pressed-together *yod*'. These words—*'ṣiṣtɔ* and *ḥbiṣtɔ*—are formed from the same roots that eventually became absolute names for the vowels /u/ and /i/ in Syriac (see below, chapter 4, §2.0, and Segal 1953, 170–72), and those appear to be the vowel qualities that Dawid means. His examples of 'softening' caused by final *waw 'ṣiṣtɔ* are the phrases *manu ḡer* and *manu ḵay* (ZFRN 192 f. 199r, lines 20 and 23), both of which contain /u/. He does not give specific examples for *yod ḥbiṣtɔ*, but in both codices in which Dawid's *scholion* appears, it is followed by an anonymous *scholion* on the six *bgdkpt* letters (ZFRN 192 ff. 200r–200v and SMMJ 356 ff. 166r–166v). This latter *scholion* supplies phrases

with /i/, like *ṣbi ḵinɔ* and *ṣbi ḏinɔ*, for word-final *yod ḥbiṣtɔ* (ZFRN 192 f. 200v, lines 10–12).

These *ʿṣiṣtɔ* and *ḥbiṣtɔ* modifiers thus designate the relatively-narrow realisations of the *matres waw* and *yod*. That is, /u/ and /i/ were considered relatively closed realisations, presumably in contrast to the relatively open /o/ and /e/. One of these more 'open' vowels—/o/—eventually gained a name that confirms this relationship (i.e., *rwiḥtɔ* 'spacious, broadened' compared to /u/) (see below, chapter 4, §2.3), but that is not the word that Dawid uses in his *scholion*. Instead, he contrasts both *ʿṣiṣtɔ* and *ḥbiṣtɔ* with the word *ptiḥtɔ* 'opened'. The only example that he gives for a *yod ptiḥtɔ* is the phrase *ʾitay ger*, and he states explicitly that this *yod* does not cause the following *gomal* to soften. Instead, it is 'hardened' (*metqashshyɔ*) (ZFRN 192 f. 199r, lines 21–22). In later Syriac grammatical texts, *ptiḥɔ* and its derivatives (e.g., *ptɔhɔ*) invariably designate the vowel /a/ or describe a consonant that is followed by the vowel /a/, but here the pronunciation of *yod ptiḥtɔ* seems to be a diphthong, /ay/. This realisation differs from what we expected as the 'opened' version of *yod* (i.e., /e/), but Dawid does specify that the word *ʾitay* does not induce fricativisation in the next word, so it cannot be a pure vowel. It may be, however, that Dawid perceived some monophthongisation of word-final /ay/ in certain contexts, with the actual pronunciation approaching /e/. Similar monophthongisation of /ay/ to /e/ in Syriac is known from other medieval manuscripts, though it occurs primarily in closed syllables (Knudsen 2015, 122). Dawid provides no examples for what he calls *waw ptiḥtɔ*, but based on analogy with *yod ptiḥtɔ* and given his note

that it *does* cause fricativisation at the end of a word, he likely meant the monophthong /o/. In both of these cases then, the word *ptiḥtɔ* would indicate the relatively open vocalic quality of a *mater lectionis* in contrast to a closed counterpart.

The works of Jacob of Edessa and Dawid bar Pawlos show that the earliest extant phonetic analyses of Syriac vowels relied on relative descriptions that contrasted qualities according to varying degrees of openness and backness. Diacritic dots placed above or below a word graphically depicted these relationships, with the 'dot above' being linked to relatively open, backed vowels, while the 'dot below' indicated relatively closed, fronted vowels. Similar descriptions of relative vocalisation also appear in the early works of the Hebrew Masoretes.

1.2. Early Masoretic Vowel Phonology

Evidence of Masoretic activity dates back as far as the sixth century, when three groups of Masoretes began to emerge: the Tiberians, based in Tiberias; the Palestinians, located elsewhere in Palestine; and the Babylonians, named for their native Iraq. Their work in preserving Hebrew recitation traditions can be divided into several overlapping stages (Khan 2000, 21; Dotan 2007, 648–49), but we are concerned with the period prior to the ninth century, when some of them described vowels according to relative phonology.

In the seventh and eighth centuries, the first Masoretes recorded their oral tradition related to the proper transmission of the Bible (Dotan 2007, 650). They produced numerous notes and lists, such as those compiled in *Okla we-Okla* (Frendsdorff 1864;

see Dotan 2007, 621, 650) and the *Masora magna* (Yeivin 1983, 33, 126–30), containing details about problematic words, grammar, and errors in the scribal transmissions of the Bible (Roberts 1969, 6–7; Dotan 2007, §3). Most of this work was done in Jewish Babylonian and Palestinian Aramaic, which remained spoken vernaculars until at least the ninth century (Khan 2000, 21; see Fassberg 1990). Furthermore, like the Syriac tradition, many of the Masoretic accent and cantillation signs had already emerged by this stage, and possibly earlier. It seems the Masoretes were not concerned with direct notation of vowel sounds before the eighth or ninth century, and in contrast to Syriac scribes, they lacked the single diacritic point which could graphically differentiate vowels on a relative basis (Dotan 1981, 89, 93–94; 2007, 625; compare Segal 1953, 58–67). However, they did employ contrastive language related to openness and frontedness, and remnants of this relative terminology are evident from numerous Masoretic sources.

Phonetic vowel terms based on the roots *ptḥ* 'opening' and *qmṣ* 'closing' predate all other Hebrew vowel names, and in their original forms they distinguished minimal pairs of vowels according to lip movement (Steiner 2005, 379–80). The earliest hint of this type of phonetic description appears to be a non-technical occurrence in the poetry of Eleazar ben Qillir (fl. c. 600) (Encyclopaedia Judaica (Germany) 2007, 743–44), who writes that one should speak with a 'closed lip' (*sɔpɔ qamuṣɔ*) when saying the name of God (Fleischer 1972, 263).[10] A number of scholars

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[10] Presumably he means *ʾadonɔy* instead of *ʾadonay*, but this is not certain.

have also noted early Masoretic lists of Hebrew homographs that differ by a single vowel, with headings such as *ḥad mɔleʾ we-ḥad qɔmeṣ* 'one fills and one closes' or *ḥad qɔmeṣ we-ḥad pɔtaḥ* 'one closes and one opens'. In these lists, the homograph with a relatively open vowel is classed as *mɔleʾ* or *pɔtaḥ*, while its counterpart with a relatively closed vowel is considered *qɔmeṣ* (Ginsburg 1880, II: §606, and III: §§529a–b; Graetz 1881a; Bacher 1974, 16, n. 6; Dotan 1974, 28–32; Steiner 2005, 379, n. 52; Posegay 2021d, 62). Most likely, these designations began as pedagogical instructions to inform an unsure reader of how to move their mouth when pronouncing particular difficult words, but over time came to describe the words and vowels themselves (Steiner 2005, 375–77, 380). These relative classifications became less relevant as the Hebrew vowel signs were introduced, but remnants of them persisted in the later terminology used to describe absolute vocalisation.

The best example of this 'remnant' relative terminology is the appearance of derivations of the roots *ptḥ* 'opening' and *qmṣ* 'closing' to describe vowels in the Tiberian *Masora*, especially as the Aramaic active participles *pɔtaḥ* and *qɔmeṣ* (Khan 2020, I:245, esp. n. 4). None of the other modern names for vowels (*ḥolem, ṣere, segol,* etc.) occur in the *Masora magna* and *parva*, suggesting that the contrastive 'open-and-closed' terminology predates them (Khan 2000, 24; Steiner 2005, 374, 377–78). Furthermore, in Masoretic notes, besides referring to /a/ and /ɔ/, the words *pɔtaḥ* and *qɔmeṣ* can also mean /ɛ/ and /e/, respectively (Yeivin 1983, 80, 113–14). In these cases, /ɛ/ is relatively 'open' (*pɔtaḥ*) in comparison to the relatively 'closed' (*qɔmeṣ*) /e/. The phrases *pɔtaḥ*

qɔṭon 'small *pɔtaḥ*' and *qɔmeṣ qɔṭon* 'small *qɔmeṣ*' appear in nu-
merous Masoretic sources and apply to /ɛ/ and /e/ in the same
way (see below, chapter 4, §3.1). These terms add another layer
to the older relative system by indicating a pair of 'small' vowels
that were articulated with comparatively less openness than /a/
and /ɔ/. Notably, this *qɔṭon* 'small' designation is cognate with
Jacob of Edessa's description of relatively-closed vowels (usually
/e/ or similar) as *qaṭṭin* (see above, present chapter, §1.1, and
Posegay 2021d, 63).

The author of the tenth-century text which Allony calls
Kitāb al-Muṣawwitāt is likewise aware of this older, two-way di-
vision of vowels. Near the end of the extant text, they write:

> [....] ב[אב.......]וצח עלל אלמצותאת כיף תוצל ותפצל ותוג[ב] ותסלב
> ותדל עלי אלמעני ואלפצול וכדלך גמיע מא [פי] אלמאסראת מן בֿ בֿ חד
> פֿת וחד קמֿ כרג מן באב פאעל ומפעול ומצאף וגיר מצאף או
> כלמ[ה..אלתי] מתלהא קמֿ אדא כאנת קמֿ לא יכלו מן דלך בתה ממתחן
> מחרר ולוגוד אלמאסראת אלדי אח[ו]דנא [עז] דכרהא

> S[ection on the][11] clarification of the reasons for the vow-
> els: how they connect or separate, how they assert or ne-
> gate, and how they indicate the meanings and divisions.
> Likewise, everything in the *māsorāt* is from two: two, one
> *pt* and one *qm*, in the same way as an actor and an acted
> upon, a dependent and an independent, or a word [that is
> *pt*],[12] when what is like it is *qm*, if [the] *qm* always occurs

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[11] Allony suggests that this first word is *bāb* 'chapter, section', in which
case the lacuna would be *b[āb fī] waḍḥ*.

[12] The lacuna here affects the last few words of MS AIU IX.A.24 f.1r.
Allony's reconstruction of *kalima allatī* is probably sound, as the tops of
a *heʾ* and *lamed* are barely visible. Based on the rest of orthography, this
leaves enough space for approximately two letters at the end of the line,

> in that which is verified and accurate, on account of the
> existence of the *māsorāt*, which for brevity we have not
> mentioned. (Allony 1965, 154, lines 115–22)

In order to explain the "reasons for the vowels (*muṣawwitāt*)," the author states that everything in the *māsorāt* (an Arabic plural of *masora*) is divided into one of two classes: *ptḥ* or *qmṣ*. The rest of the passage is a list of two-way states that are meant to be analogous to the relationship between one *ptḥ* and one *qmṣ*. For example, in grammar, a word can be an 'actor' (*fāʿil*) or 'acted upon' (*mafʿūl*). A word can be 'dependent' (*muḍāf*; usually implying a genitive construction) or 'independent' (*ghayr muḍāf*). These grammatical distinctions are relevant given subsequent examples listed in the text, which include words that vary by a single vowel depending on their context in Tiberian recitation of the Bible. One such example is *mazɔrɛ* (מְזָרֶה; 'scatters' in Prov. 20.26) and *mazɔre* (מְזָרֶה; 'scatters' in Jer. 31.10) (Allony 1965, 156, lines 125–26). The form with /ɛ/ is *pɔtaḥ* while the form with /e/ is *qɔmeṣ*. It follows then that a 'word' (*kalima*) can be *pɔtaḥ* while 'what is like it' (*mithluhā*; i.e., its homograph) is *qɔmeṣ*. It is not

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with the badly rubbed traces of two partial strokes still visible. There is also a single dot, again badly rubbed, just above the ruled line over the remnants of these letters. This position is consistent with the height of other dots that the scribe used for abbreviations (i.e., פתֹ and קמֹ). I suspect that the abbreviated word פתֹ used to be here, such that the end of the line was *kalima ʾallatī pt* and the full clause read *ʾaw kalima ʾallatī pt mithluhā qm* 'or a word that is *pɔtaḥ*, when what is like it is *qɔmeṣ*'. This reconstruction makes structural sense, as the clause ought to continue the author's list of two-way relationships that are analogous to "one *ptḥ* and one *qmṣ*."

clear exactly what the author means by the '*māsorāt*' that verify the appearance of *qɔmeṣ*, but they are probably referring to a known corpus of Tiberian texts, including the *Masora magna* and *parva* and perhaps some other 'independent' Masoretic works (see Dotan 2007, 621).

Besides the Tiberian tradition, remnants of the open-and-closed contrastive terminology also appear in the Babylonian naming for /a/ and /ɔ/, and redundancies among the Babylonian terms reveal an older relative system. The Babylonian Masoretes had three names for the vowel /ɔ/: *miqpaṣ pummɔ, meṣap̄ pummɔ,* and *ʾimṣɔ*. This first name, *miqpaṣ pummɔ* 'closing the mouth' stands in contrast to one of the names for /a/, *mip̄taḥ pummɔ* 'opening the mouth' in the same way as the equivalent Tiberian terms. Similarly, *ʾimṣɔ* 'closure' opposes the second Babylonian name for /a/, *pitḥɔ* 'opening' (Morag 1974, 71). Morag argues that the remaining term—*meṣap̄ pummɔ* 'caution of the mouth'— is unique among the three, and it refers to the action required to carefully articulate a vowel that falls between /a/ and /o/. As such, it must have come into use after the Babylonian Masoretes had specifically defined the quality of each vowel, at a time when 'closing' was no longer a logical concept to assign to /ɔ/ (Morag 1974, 72). That is to say, *miqpaṣ pummɔ* and *ʾimṣɔ* must have been derived according to contrastive principles prior to the introduction of absolute, one-to-one vowel names. This evolution matches the development of the Tiberian relative vocalisation terminology as well as its subsequent decline with the rise of absolute vowel naming.

These earliest relative descriptions of vocalisation began as contrasts between physical articulatory motions, but both Syriac and Hebrew scholars eventually associated those physical features with phonetic 'height'. This shared association led them to develop notation systems for absolute vocalisation that each encoded vowel phonology according to graphemic principles of dot position.

1.3. Connecting the Dots

Both Syriac and Hebrew scholars created a genre of writings specifically devoted to preserving the integrity of their biblical texts between the eighth and tenth centuries. For Hebrew, we call these scholars Masoretes, referring to those who compiled notes about the Bible from their oral tradition of *masora* 'passing down'. Both East and West Syriac authors wrote similar notes for the study of biblical and patristic texts, and this Syriac genre is known now by the word *mashlmɔnutɔ,* also 'passing down' (Kiraz 2012, I:15). It has also been deemed the 'Syriac Masora', based on direct analogy with the Hebrew tradition (Yeivin 1983, 36; Loopstra 2014, I:I). Despite this comparison, the Syriac authors of these texts refer to them as collections of *shmɔhe* 'nouns' and *qrɔyɔtɔ* 'readings', and they are more pedagogical tools for teaching the reading tradition than anything else (Loopstra 2009, 13–14; 2014, I:V–VI; see also, Hoffmann 1880, V). While in some ways their work was similar to that of the Masoretes, these Syriac teachers did not, for example, attempt to quantify and cross-reference the occurrences of rare words in the Bible. Instead, they

produced a corpus of handbooks related to grammatical, ortho-graphic, phonetic, and accentual rules, which a reader could ref-erence in order to interpret difficult words even in an unvocalised text (Loopstra 2009, 15; 2014, I:III–IV; see also, Balzaretti 1997). Consequently, one aspect of these traditions where Syriac and Hebrew scholars overlap is in the practice of writing homograph lists, which they both used to track words that differed only in their vowels (Balzaretti 1997, 75; Dotan 2007, 622–23; Loopstra 2014, I:IV).

In the Hebrew tradition, most of these lists divided homo-graphic pairs according to stress, separating them with the Ara-maic terms *milleʿel* 'above' (penultimate stress) and *milleraʿ* 'be-low' (final stress) (Yeivin 1983, 102–3), often with the heading *ḥad milleraʿ we-ḥad millʿel* 'one is below and one is above' (Graetz 1881a, 348; Dotan 1974; 2007, 623–24). Using these lists, Hein-rich Graetz argued for a connection between the Tiberian Maso-retic tradition and Syriac on the basis of diacritic dot positions. He found that in a few of the homograph lists in *Okla we-Okla*, the terms *milleʿel* and *milleraʿ* actually distinguished Hebrew hom-ographic pairs that differed by one vowel, rather than by stress (Graetz 1881a; 1881b; Dotan 2007, 622–23). Graetz identified this usage as part of a relative vocalisation system, reflecting a further extension of the early comparative descriptions of He-brew vowel phonology discussed above (Dotan 1974, 32; Steiner 2005, 379). He also hypothesised that *milleʿel* and *milleraʿ* origi-nally referred to the locations of diacritic dots that were placed above or below Hebrew homographs to indicate the relative qual-ity of their vowels, just as the diacritic dot functions in Syriac.

However, very few diacritic dots have ever been attested in Hebrew *milleʿel* and *milleraʿ* lists, and even in those rare cases, the dots indicate stress rather than vowel quality (see Morag 1973; Dotan 2007, 623).[13] As such, Aron Dotan has taken a hard stance against Graetz's theory, insisting that Syriac had no terms equivalent to *milleʿel* and *milleraʿ* that the Masoretes could have borrowed, and that those terms would not have seen continued use after the supposed 'disappearance' of Graetz's hypothetical and unattested Hebrew diacritic dots (Dotan 1974, 28; 2007, 622–23; Posegay 2021d, 64–65).

The following discussion takes a different view, making three assertions in challenging both Graetz's and Dotan's theories. First, there were, in fact, Syriac linguistic terms similar to *milleʿel* and *milleraʿ*—specifically attested in Jacob of Edessa's writings—that Masoretes could have borrowed to describe vocalisation prior to the ninth century. Second, there was never any diacritic dot in Hebrew that differentiated vowels in the same way as the Syriac dot. Third, while both Syriac and Hebrew scribes had knowledge of the same principles of relative vocalisation, they each manifested those principles differently in the subsequent development of their respective absolute vowel pointing systems.

As previously mentioned, Jacob of Edessa explains how to point Syriac homographs in his tractate, *On Persons and Tenses*, where he states: "Every saying, that is, [every] form, when it is thick or wide with sound, then it takes a point above. But when it is narrow or thin, then below" (Phillips 1869, ܠ; see above,

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[13] Also note the earlier view of Morag (1961, 17, n. 1).

present chapter, §1.1). A word with 'thick' vocalisation takes a dot *men lˤel* 'above', while its 'thinner' homograph is *men ltaḥt* 'below'. Most often, that meant that words with more backed vowels (e.g., /o/, /ɔ/, /a/) took a dot above in comparison to their homographs with comparatively fronted vowels (/u/, /e/, /i/) (Kiraz 2015, 44–46; Posegay 2021d, 66). Notably, Jacob does not repeat the word 'dot' (*nuqzɔ*) in the latter half of his statement, such that it could be read as a designation of 'thin' or 'narrow' words as phonetically 'below' (*men ltaḥt*). Fronted vowels would thus be considered 'lower' than their 'above' counterparts, which were relatively backed. This usage of *men lˤel* and *men ltaḥt* seemingly as phonetic descriptors correlates with Jacob's descriptions of other 'above' and 'below' words elsewhere in the tractate (Posegay 2020, 198–200). It likely arose from an implicit association of relatively backed vowels with the 'higher' position of the supralinear diacritic dot in Syriac. When used in this type of phonological context, these two phrases—*men lˤel* and *men ltaḥt*—are plausible sources for the Masoretic *milleˤel* and *millera*ˤ terms with the same meanings.

In the conclusion of his first article deconstructing Graetz's theory, Dotan critiques the utility of Jacob of Edessa's phonological analysis as evidence for connecting Syriac and Masoretic ideas. Quite significantly, he does not seem to have noticed the appearance of *men lˤel* and *men ltaḥt* in Jacob's tractate, and so makes the following statement:

> Some Hebrew Masoretic lists of homographs are certainly very ancient, but we cannot know the date of their compilation. Thus much for the common aspects of Hebrew and Syriac. As to all the rest, they have nothing in common,

and that, not only in the technical graphic sense of the use of the points, but what is much more important, in the aspect of contrasting the vowels. In Syriac the contrast is generally between forms with what is regarded as "fuller, stronger pronunciation" and forms with a "finer, weaker" one. These notions which cannot and could not be sufficiently defined suffered, therefore, many deviations in application, as Graetz has already pointed out, and rightly so. In Hebrew, however, the contrast is always within the domain of a very clear scale, based on phonetic grounds which hold true even today. (Dotan 1974, 33)

The common use of homograph lists is certainly a potential vector for intellectual exchange between early Masoretes and Syriac grammarians, although it is true that we cannot date them precisely. As we have seen though, there is actually great similarity between the early Syriac and Hebrew relative vocalisation systems. The earliest phonological vowel descriptions in both languages involve comparisons of openness between two vowels. These contrasts occur in Jacob of Edessa's (d. 708) and Dawid bar Pawlos' (fl. c. 770–800) grammatical writings, early Masoretic homograph lists, and the first vowel names of both the Tiberian and Babylonian Masoretes. Dotan's interpretation of the Syriac contrasts between "fuller, stronger" and "finer, weaker" forms is thus misleading. The qualities that Jacob ascribes to the vowels in *On Persons and Tenses* are not based on strength or weakness, but rather are *ʿbe* 'thick', *nqed* 'thin', *pte* 'wide', and *qaṭṭin* 'narrow'. Dotan's misinterpretation may originate with a similar statement by Segal, who characterised the Syriac system as dependant on the dominance and weakening of homographic forms (1953, 11).

The ʿ*be* and *nqed* terms are borrowed from the Greek grammatical tradition, so while Jacob does describe open vowels as thick or thin, he does so in order to fit Syriac phonology into a Greek-inspired model (Revell 1972, 367; Talmon 2008, 166–67; see also, Knudsen 2015, 77). These two most likely refer to the relative backness of a vowel, which also happens to correlate with relative openness for most Syriac vowels. The other two—*pte* and *qaṭṭin*—are grounded in a conception of 'wide-and-narrow' phonology that explained vowels according to openness. Jacob does not convey any measure of 'strength' or 'weakness' in vowels (nor does Dawid bar Pawlos). Still, Dotan's statement regarding the early Syriac ideas that "could not be sufficiently defined" and thus "suffered... many deviations in application" highlights the problems of ambiguity inherent in a relative vocalisation system. It is for precisely this reason that Syriac scribes completed their absolute vocalisation system with discrete vowel points and names around the end of Jacob's life (Kiraz 2012, I:20–21). This system took the ideas of 'wide-and-narrow' and 'thick-and-thin' phonology, as well as their association with phonetic 'height', as its defining principles.

On the other side, the statement that "in Hebrew... the contrast is always within the domain of a very clear scale" refers to Dotan's observation that the Hebrew *milleʿel* and *milleraʿ* lists are based on comparisons of phonetic backness, with more-back vowels considered 'higher' in the mouth. This is the correct interpretation of the *milleʿel* and *milleraʿ* lists that compare vowels, and Dotan also notes that this type of comparison according to backness is the principle behind the arrangement of the 'vowel

scale' in the fifth chapter of Saadia Gaon's (d. 942) Hebrew grammar, *Kutub al-Lugha* (*The Books of the Language*) (Dotan 1974, 29–30; see below, chapter 4, §§3.3–4). However, the persistence of this conception of 'height' from the known early Masoretic lists up through the tenth century does not indicate that the Hebrew tradition *always* contrasted vowels according to that scale. Dotan himself points out that Ginsburg's homograph list with the heading *ḥad qmṣ we-ḥad ptḥ* 'one closes and one opens' (Ginsburg 1880, II:310–11, section 606) is identical to a list from *Okla we-Okla* that has the heading *ḥad milleʿel we-ḥad milleraʿ* 'one is above and one is below' (Dotan 1974, 24; see Frendsdorff 1864, no. 5), which suggests that the idea of comparing relative backness coincided with or superseded an idea of relative openness. This coincidence is not dissimilar to Jacob of Edessa's connections between 'wide' and 'thick' vowels, and could well have evolved from contact with a Syriac source.

It is impossible to say whether this list that appears with two different headings was originally written for 'opening-and-closing' or 'above-and-below' comparisons. Somewhat suspiciously though, all of the examples of *milleʿel* 'above' words in this list are also relatively *qɔmeṣ* 'closing'. This correspondence only occurs when the Hebrew vowel /o/ is compared to /ɔ/, /a/, or /ɛ/; when /ɔ/ is compared to /a/ or /ɛ/; or when /u/ is compared to any vowel besides /o/. In all of these cases, the vowel which is farther back in the mouth would also be more closed than the vowel with which it is compared. Consequently, if a Masorete had a homograph list that was arranged according to relative openness, but they wanted to re-label it with *milleʿel* and

millera͑, then they would have to remove any examples with vowel pairs other than the ones mentioned. Those pairs would include: /a/ with /ɛ/, /e/, or /i/; /ɛ/ with /e/ or /i/; /e/ with /i/; and /o/ with /u/. We find that all of these pairings are absent from this list. Moreover, the *mille͑el-millera͑* scale model of 'backness as height' does seem to have continued on through the medieval Hebrew grammatical tradition, and certainly into Saadia's grammatical writing.

Bearing all of this in mind, the following is a potential framework for the parallel development of the Syriac and Hebrew relative vowel systems as they transitioned to absolute vowel pointing. In both systems, the association of height with backness directly informed the placement of the vowel points.

In the seventh century, or possibly earlier, Syriac teachers and the first Masoretes began writing homograph lists to keep track of words in the Bible that had identical consonants. They judged these comparisons according to an easily observable phenomenon—relative openness of the mouth—and various groups used different words to describe these differences. In Syriac, Jacob of Edessa called them 'wide' (*pte*) or 'narrow' (*qaṭṭin*), while Dawid bar Pawlos referred to 'opening' (*pɔtaḥ/ptiḥɔ*) and 'contracting' (*ʾɔsar/ḥbiṣɔ/ṣiṣɔ*). Similarly, Tiberian Masoretes used *ptḥ* 'opening' and *qmṣ* 'closing', while their Babylonian counterparts said *miqpaṣ pummɔ* 'closing of the mouth' and *miptaḥ pummɔ* 'opening of the mouth' or *ʾimṣɔ* 'closure' and *pitḥɔ* 'opening'.

Accompanying the Syriac versions of these homograph lists was the diacritic dot system, which used a point 'above' (*men l͑el*) to indicate a word with more open vocalisation, while a point

'below' (*men ltaḥt*) marked the homograph with less open vowels.[14] In the late seventh or early eighth century, the phrases *men lʿel* and *men ltaḥt* acquired an additional function, coming to describe the comparative phonetic qualities of words or vowels, rather than just the locations of diacritic dots. The 'more-open' vowels also tended to be 'more-back', and Syriac scholars began to associate dot height with phonetic backness. This principle was foundational to the absolute vowel pointing system in Syriac, which largely stabilised in its final form during the eighth century (Kiraz 2012, I:20–21). In this system, the 'most-above' (thick, backed) vowel, /ɔ/, received two supralinear dots, the 'intermediate' vowel /a/ took one dot above and one below, and the 'below' (thin, fronted) vowel /e/ got two sublinear points (Segal 1953, 26–30; Kiraz 2012, I:12–13, 21, 70–71; 2015, 41–47, 98–101; Posegay 2021d, 67–68). A *mater lectionis yod* usually indicated /i/, but as another 'below' vowel, one or two dots under a *yod* could also represent it. Then the 'above' vowel /o/ took a single supralinear dot—always above a *waw*—while a single dot beneath *waw* indicated its 'below' contrast, /u/. This pointing system remained the standard system for most East and West Syriac scribes until the beginning of the tenth century, and remained in use for East Syriac scribes after that (Coakley 2011; Kiraz

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[14] Recall that the Syriac diacritic dot system, invented prior to Jacob of Edessa's lifetime, was likely based on a phonetic system in which the vowel now called *zqɔpɔ* was pronounced unrounded (close to /ɑ/), and was thus both more open and more back than /a/ (Kiraz 2015, 45; Knudsen 2015, 90–98, 115; Butts 2016, 89–90).

2012, I:79–80). The authors who applied it to grammatical writing also maintained this connection between height, openness, and backness, and eventually named the vowels according to principles of 'wide-and-narrow' and 'high-and-low' qualities (see below, chapter 4, §2.0).

At roughly the same time—no later than the eighth century—the Tiberian Masoretes adopted the idea of *mille'el* 'above' and *millera'* 'below' vowel phonology. They most likely heard of this concept from Syriac teachers, and like their Syrian counterparts, they associated 'above' and 'below' with phonetic backness. They thus wrote homograph lists that distinguished relative vowel pairs according to that attribute. Crucially, however, they did not at any point adopt the Syriac usage of a single diacritic dot to differentiate homographs. They merely took the *ideas* of *mille'el* and *millera'* (or *men l'el* and *men ltaḥt*) as descriptions of phonetic backness and applied them to Hebrew accordingly. Eventually, the link between backness and 'height' led to the notion of a full vowel scale, now well-known from later medieval sources, like *Kutub al-Lugha*.

This backness principle also informed the creation of the absolute system of Tiberian vowel points, similar to Syriac's first absolute vocalisation system. However, due to the earlier invention of a Tiberian cantillation system, accent signs filled much of the supralinear space in a Tiberian Bible, so the Tiberian Masoretes favoured sublinear vowel signs (Dotan 1981, esp. 98).[15] As

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[15] This chronology also matches that of the Syriac tradition, which had a complex system of accent points (or 'reading dots') before an absolute vocalisation system (Segal 1953, 58–78; Loopstra 2019, 161–66).

such, they needed a graphical method for conveying movement along a vertical scale using primarily sublinear dots, and that is precisely what they created. In the Tiberian vocalisation system, each dot represents a step on the *milleʿel-milleraʿ* scale (Posegay 2021d, 69–71).

First, /o/, the most-back, and thus most-*milleʿel* Hebrew vowel, received a high supralinear dot (אֹ). By maximal contrast, the most-*milleraʿ* vowel, /i/, took a single sublinear dot (אִ). These two dots represent the two farthest ends of the vowel scale, and correlate conceptually with the single diacritic dots placed above or below a Syriac homograph. In this manner, almost as Graetz hypothesised, the Masoretes did have 'diacritic' dots that functioned like the Syriac relative dot, but they were already absolute vocalisation signs. The reason for this development is that the Tiberian Masoretes introduced these vowel points comparatively later than Syriac scribes, at a time when absolute vocalisation was already replacing relative descriptions, and so they assigned each dot a single phoneme (/o/ or /i/).

After /i/, each step up the scale gains a single dot. The vowels /e/ and /ɛ/ each occupy one or two steps, respectively, above /i/ on the scale, and so take one (אֵ) or two (אֶ) additional dots. Then the signs for /a/ (אַ) and /ɔ/ (אָ)—each including a sublinear line segment—are graphically unique in the Tiberian system, and the Masoretes likely prioritised their differentiation in biblical reading due to a lack of distinction between /a/ and /ɔ/ in spoken Jewish Palestinian Aramaic (Fassberg 1990, 28–31, 53; Steiner 2005, 380; Posegay 2021d, 63). These line segments may

have been modified from the sign for /a/ in the Palestinian vo-
calisation system (א),[16] probably already in use near Tiberias in
the eighth century, which the Tiberians simply shifted to a sub-
linear position. This comparison also explains the single dot be-
low the line segment for /ɔ/,[17] as it represents a single step up
from /a/, which has no dot.

   Furthermore, similar to Syriac, when a *mater lectionis waw*
was present, /u/ only needed to contrast with /o/, so it received
a single dot within the *waw* in the middle of the line. This middle
position represented /u/'s status as more fronted—that is, more
milleraʿ—than /o/, but more *milleʿel* than the rest of the vowels.
Finally, the sublinear three-dot sign for /u/ is somewhat anoma-
lous, but given that it is the second most backed vowel, it ought
to have the most sublinear dots to represent the most 'steps' up
from /i/. It is also the least common vowel sign in Tiberian He-
brew, which may suggest that it was the last to be added to the
system. Notably, later descriptions of the vowel scale actually re-
move /u/ from its position next to /o/ and place it at the lowest
possible position, outside the mouth.[18]

   Once the Tiberian Masoretes had their full absolute vocali-
sation system, they had no need for relative vowel phonology,
and the terms *milleʿel* and *milleraʿ* became unnecessary for de-
scribing vowels. It was at this time that the terms probably gained
their more well-known use for indicating stress positions, as such

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[16] On this sign, see Dotan (2007, 625–26).

[17] The original *qɔmeṣ* sign was a horizontal stroke with a dot beneath it,
but most modern fonts do not render this form.

[18] See Posegay (2021, 70, n. 72); see also below, chapter 4, §§3.3–4.

distinctions were still useful when reading a vocalised text with no cantillation signs. In this form, the two words were eventually codified into the *Masora* of the Leningrad Codex, and they continue to represent a small hint of the time when Hebrew and Syriac scholars had a mutual understanding of vocalisation.

This proposed development of the Tiberian vocalisation system remains highly speculative, but it is a plausible interpretation of the principles of relative vocalisation and phonetic 'height' that Hebrew Masoretes seem to have shared with Syriac scribes and grammarians. The Tiberians clearly did not borrow the Syriac vowel points for use in their biblical text, but they may have heard of these 'relative' principles or terms like *men lʿel* and *men ltaḥt* from Syriac contemporaries. Intellectual exchange of this type was certainly possible between Jewish and Syriac Christian scholars in the eighth century. Both groups had a long parallel history of scholastic institutions in the East Syrian school systems and the Rabbinic academies (Becker 2003, 387–91; 2006, 16, 18, 219 n. 98; 2010, 98–99, 103–8; see also, Vööbus 1965), they still retained Aramaic (in some form) as a shared vernacular, and a number of early medieval sources report direct contact between Jewish and Christian intellectuals (Siegal 2018; Butts and Gross 2020, 18–23; Posegay 2021d, 75; see also above, chapter 2, §1.0). Even Jacob of Edessa himself mentions Jews in nearby communities a few times in his writings (Hoyland 2008, 17, 20–21), and he seems to have had an affinity for the Hebrew

language not seen among other Syriac grammarians (Salvesen 2001, 457–67; Butts and Gross 2020, 17–18).[19]

This kind of intellectual exchange might also explain the relatively sudden appearance in the historical record of the complete Tiberian vocalisation system, without any evidence of prior developmental stages. If the Tiberians intentionally designed a new absolute vocalisation system, and they decided that that new system should encode phonetic height, then we would expect it to be complete and internally consistent from the outset (see Morag 1961, 29). The Tiberian vocalisation system, at least as we know it, fits this description much better than the Palestinian and Babylonian systems, both of which are comparatively inconsistent with longer periods of evolution (Dotan 1981, 87; 2007, 525, 630, 633; Yeivin 1985; Khan 2013). In any case, there is no evidence of a long Tiberian developmental process such as we find in Syriac, with the gradual introduction of signs that evolved organically from earlier, less precise diacritic dots.

Even if this reconstruction of the Tiberian vocalisation system is not sound, the fact remains that both Syriac and Hebrew linguists employed relative terminology based on openness and backness to describe their vocalisation before the introduction of absolute vowel points. At the same time as these Syriac and Hebrew scribes were creating those absolute systems, Qurʾānic vocalisers were also adapting the Syriac diacritic dot to function as an absolute vocalisation system in Arabic. This development was

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[19] Jacob probably could not actually read Hebrew, and most of his information about the language came from Greek sources. See also, Salvesen (2008).

itself related to the system of diacritic dots that Arabic scribes used to differentiate consonants, which also depend on 'relative' distinctions of phonetic height. Additionally, relative phonetic terminology similar to that discussed above actually appears in eighth-century discussions of Arabic vocalisation, although it applies mainly to allophones, rather than to phonemic vowels.

2.0. Relative Phonology in Arabic

Using principles similar to the early Syriac and Hebrew descriptions of vowel phonology, the first Arabic linguists also applied a relative system to identify the vowels of their recitation tradition. Like seventh- and eighth-century Jews and Christians, Qurʾānic readers first identified some of their vowels using terms derived from connections between backness and height. The earliest Arabic diacritic dots provide evidence for this relative phonology, as they were placed using the same 'high' and 'low' phonetic associations as seen in the Syriac dot systems, albeit for consonants rather than vowels. The concept also carried into the invention of the Arabic red-dot vocalisation system, which took shape around the end of the seventh century. Early Arabic grammatical sources, specifically *Kitāb Sībawayh* and *Kitāb al-ʿAyn,* also preserve two-way contrastive phonetic terminology that, like in Syriac and Hebrew, linked the back of the mouth to phonetic 'height'. This early tradition used *naṣb* 'standing upright' and *ʾimāla* 'bending down, inclining' to describe the various allophones of *ʾalif* in Qurʾānic Arabic, according to their relative points of articulation. Also, as in Syriac and Hebrew, this two-

way comparison of vowels contributed to an absolute naming system during the eighth century.

2.1. Inverting the Alphabet: Letters and Dots in Arabic

The earliest Arabic script evolved from Nabatean writing in the fifth and sixth centuries, possibly spurred on by the spread of Christianity in the Arabian Peninsula during the century before Islam (Abbott 1939, 17; George 2010, 21–26; see also, Robin 2006; Hoyland 2008a). This Arabic lacked the diacritic dots and vocalisation marks seen in modern Arabic, but the rise of Islam and the necessity of unambiguously representing the words of the Qurʾan accelerated the development of Arabic pointing systems. The earliest system of Arabic ʾiǧām 'distinguishing dots' emerged by the first half of the seventh century at the latest,[20] consisting of short strokes or ovoid dots that differentiated consonants with similar forms (Abbott 1939, 38; Rezvan 2004, 95; Ghabban and Hoyland 2008; George 2010, 29–31, 51).

   E. J. Revell has shown that Arabic scribes did not place these dots arbitrarily, but rather the positions of the dots encode information about the relative phonetic quality of consonants. He identifies three stages of ʾiǧām development, but the first is most pertinent here. In this stage, scribes distinguished consonants which were identical in writing, but had different points of artic-ulation. A consonant articulated farther back in the mouth re-ceived a dot above, while its graphemic twin with a more fronted

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[20] Though note al-Shdaifat et al. (2017), who argue for the application of a Nabatean diacritic dot in an Arabic inscription that might be from the sixth century.

position received a dot below (Revell 1975, 178–79). For example, medial *nūn* and *bā°* were identical in writing, so the alveolar *nūn* took a dot above (ن) in contrast to the relatively fronted bilabial *bā°* (ب). Likewise, the velar *khā°* (خ) was farther back than the palatal *jīm* (ج). The pair of *qāf* and *fā°* also falls into this category, as early manuscripts show the uvular *qāf* with a single dot above (ف), while the labio-dental *fā°* takes a dot below (ڢ) (see Khan 1992, 43; Gruendler 2001).[21] Additionally, some manuscripts distinguish the palatal *shīn* (ش) with three dots above, while the dental *sīn* takes three dots below (ڛ) (Gruendler 2001, 140).[22] The diacritics of these consonant pairs thus reflect an understanding of the back of the mouth as 'higher' than the front.

This correlation of phonetic backness with height mirrors that of the Hebrew and Syriac relative vocalisation systems, discussed at length in the previous section. Revell argues that such ideas about backness led Arabic-writing Christians or Jews to develop these first contrastive *°i‘jām* dots in the pre-Islamic period (Revell 1975, 184–85, 190),[23] although none of the dots are attested prior to the advent of Islam (George 2010, 29). Reports

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[21] This practice of dotting *qāf* and *fā°* has continued in some *maghrebī* scripts up to the present day (George 2015, 12).

[22] Three dots were also necessary to distinguish *sīn* and *shīn* from medial combinations of *bā°*, *tā°*, *thā°*, and *nūn* (see Déroche et al. 2015, 220–21; Witkam 2015).

[23] He also posits that the association of backness and articulation points with height in Arabic, Syriac, and Hebrew is ultimately derived from Indian phonetic concepts. This argument is not necessary to explain the perceived similarities between the Semitic phonological systems, and

within the Arabic linguistic tradition do acknowledge some Syriac influence in the invention of the script, but evidence from early Arabic papyri and inscriptions suggest that the earliest forms of the letters themselves were mainly the result of its Nabatean origins (Abbott 1939, 38; George 2010, 22, 26–27). However, *ḥijāzī* scripts from the first few decades of Islam do show Syriac calligraphic influences in the thickness and slanting angles of their strokes. They also tend to have ovoid dots for their *ʾiǧām*, rather than the slanting strokes which become more prevalent in later Qurʾāns, which may have been an attempt to match the round diacritic dots of Syriac precursors (George 2010, 51–52, 75). They may also have favoured the use of *ʾiǧām* on specific difficult words or grammatical categories, following similar tendencies among Syriac scribes to mark only ambiguous homographic forms with the diacritic dot (Kaplony 2008, 101). Furthermore, there is at least one Arabic inscription from the sixth or seventh century that appears to have diacritic dots held over from earlier Aramaic writing systems (al-Shdaifat et al. 2017).

Regarding the connection between phonology and *ʾiǧām* dot position, Revell concludes that "once the theory had served its purpose, it was likely forgotten, and never passed on to adherents of Islam" (Revell 1975, 190), but this is not completely true. The same principle persisted in the creation of the first 'red-dot' vowel points applied to the text of the Qurʾān near the end of the seventh century. Nabia Abbott argues that these signs were introduced first in Iraq, where there was less resistance to modifying

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the connection with Indian linguistic theory is probably a coincidence; see Versteegh (1993, 27–28, 31).

Qurʾānic orthography than in the Hijaz (1939, 21, 59). Extant manuscripts suggest Syria is a more likely location than Iraq, though it is difficult to identify the place of origin with certainty (George 2010, 78; 2015, 7). Either way, the first attested red dots appear in Qurʾān manuscripts from the Umayyad era, including MSS Marcel 13, BNF Arabe 330c, and TIEM ŞE321 (see Déroche 2014, figs. 1–44). While it remains possible that red dots were added some decades or even centuries after the completion of these manuscripts' consonantal texts, their script style is similar to that of the inscriptions on the Dome of the Rock, suggesting they were produced as part of the Caliph ʿAbd al-Malik's (d. 705) scribal programmes (George 2010, 75–78). This period corresponds with the timeframe given in traditional Arabic sources for the introduction of the red dots, as the majority of accounts claim that either the Caliph ʿAlī (d. 661) or the Iraqi governor Ziyād ibn Abīhī (d. 673) asked the grammarian Abū al-Aswad al-Duʾalī (d. 689) to invent a system to preserve the correct recitation of the Qurʾān.[24] Others suggest that it was the governor al-Ḥajjāj ibn Yūsuf (d. 714) who asked the grammarian Naṣr ibn ʿĀṣim (d. 707) to create a vowel system, and a few sources give credit to Ḥasan al-Baṣrī (d. 728/9) or Yaḥyā ibn Yaʿmar (d. 746) (Abbott 1939, 39).

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[24] The 'modern' Arabic vocalisation system, with slanted strokes for /a/ and /i/ and a small *wāw* for /u/, does not appear regularly in Qurʾān manuscripts until the tenth or eleventh century. It is attested in non-Qurʾānic texts from the ninth century (Déroche 2003; George 2015, 13–14; Posegay 2021).

While it is possible that Abū al-Aswad was the true 'inventor' of the red-dot system, its creation has been mythologised in the Arabic grammatical tradition. As the Andalusian *tajwīd* scholar Abū ʿAmr al-Dānī (d. 1053) tells it in *al-Muḥkam fī Naqṭ al-Maṣāḥif* (*The Rules for Pointing the Codices*), Ziyād ibn Abīhī asked Abū al-Aswad to make something for the Qurʾān that would prevent the corruption of its recitation. At first, Abū al-Aswad refused, but then:

فوجّه زياد رجلاً، وقال له: اقعد في طريق أبي الأسود، فإذا مرّ بك، فاقرأ شيئاً من القرآن، وتعمّد اللحن فيه. ففعل ذلك. فلمّا مرّ به أبو الأسود رفع الرجل صوته، فقال: أَنَّ اللّٰهَ بَرِىءٌ مِنَ المُشْرِكِينَ وَرَسُولِهِ. فاستعظم ذلك أبو الأسود، فقال: عزَّ وجهُ اللّٰه أن يبرأ من رسوله.

ثم رجع من فوره إلى زياد، فقال: يا هذا، قد أجبتُك إلى ما سألتَ، ورأيتُ أن أبدأ بإعراب القرآن، فابعثْ إليّ ثلثين رجلاً. فأحضرهم زياد. فاختار منهم أبو الأسود عشرة. ثم لم يزل يختار منهم حتى اختار رجلاً من عبد القيس.

فقال: خذ المصحف وصِبْغاً يخالف لون المداد. فإذا فتحتُ شفتيّ فانْقُطْ واحدةً فوق الحرف، وإذا ضممتُهما فاجعل النقطة إلى جانب الحرف، وإذا كسرتُهما فاجعل النقطة في أسفله، فإن أتبعتُ شيئاً من هذه الحركات غُنَّةً فانْقطْ نقطتين.

Ziyād brought up a man and said to him, "Sit by the path of Abū al-Aswad, and if he passes by you, then recite part of the Qurʾān, but make a mistake intentionally." And he did that. When Abū al-Aswad passed by him, the man raised his voice and said, "God is disassociated from the polytheists and from His messenger."[25] Abū al-Aswad noticed this, and said, "How great can the design of God be, that He would disassociate from His messenger?!"

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[25] Q. 9:3 (al-Tawba). The man said ʾanna llāha barīʾun mina l-mushrikīna wa-rasūlihī, but the proper reading is with wa-rasūluhū, i.e., "that God is disassociated from the polytheists, and so is His messenger."

> He went straight back to Ziyād and said, "Now look here:
> I have an answer for you, to what you requested. I have
> decided to begin making ʾiʿrāb in the Qurʾān. Bring me
> thirty men." And Ziyād brought them. Abū al-Aswad se-
> lected ten from among them, and he only stopped once he
> had chosen a man from ʿAbd al-Qays.

> Then he said, "Take a codex and some dye of a different
> colour than the ink. When I open my lips, make a single
> dot above the letter. When I press them together, put the
> dot next to the letter. Then when I break them, put the dot
> below it. If I follow any of these vowels with a nasal sound,
> then make two dots" (al-Dānī 1960, 2b–3a).

At the core of this system, a red dot above a letter marked the
vowel /a/, a dot to the left marked /u/, and a dot below marked
/i/.[26] Two dots marked nunation (*tanwīn*) at the end of a word.
Although al-Dānī does not suggest that Abū al-Aswad actually
named the Arabic vowels, he does describe the lip movements
that happen when one articulates /a/, /u/, and /i/, using verbs
that share roots with the Arabic vowels *fatḥa* 'opening', *ḍamma*
'pressing together', and *kasra* 'breaking'. Still, al-Dānī is likely too
late a source to know with any certainty what Abū al-Aswad said
on the day of the first red dots.[27] Interestingly, the notion that he
changed his mind with respect to recording the ʾiʿrāb is reminis-
cent of his Syriac contemporary, Jacob of Edessa (d. 708), who

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[26] Other dot colours and diacritic signs could represent additional fea-
tures (e.g., *hamza* and *shadda*) or record multiple *qiraʾāt* in a single man-
uscript. See Dutton (1999; 2000) and Muehlhaeusler (2016).

[27] For further analysis on the historical reliability of the tradition behind
the dots, see George (2015, 5–7).

reluctantly created Syriac vowel letters after initially believing that they were unnecessary.[28]

While it is difficult to definitively date any vocalised man-uscripts to Abū al-Aswad's lifetime (George 2015, 4–5), it is safe to conclude that vowel dots first appeared in Arabic sometime between 675 and 725. This period also coincides with the time prior to absolute Syriac vocalisation, in which the diacritic dot system was at its peak, and overlaps with the end of Jacob of Edessa's life. This coincidence has not gone unnoticed, as Abbott points out that "Arabic traditionists acknowledge the influence of Syriac" in the creation of the red-dot system (1939, 38), and Versteegh remarks that its inventor "borrowed the system of punctuation from the Syrians" (1993, 29). Versteegh further claims that it is "obvious" the red dots were arranged in accord-ance with the placement of the Syriac diacritic dots (Versteegh 1993, 30; see also, Lipiński 1997, 163), which seems to be accu-rate. As we have seen with Jacob of Edessa's writings (above, present chapter, §1.0), the seventh-century Syriac diacritic dot system marked vowels by contrasting them between homo-graphs. In general, a supralinear dot marked a homograph with /ɔ/ or /a/, a sublinear dot marked /e/ or /i/, and a supralinear dot with a sublinear dot on the same word marked /a/ (Kiraz 2015, 41–47). Arabic scribes adapted this system for their smaller vowel inventory,[29] taking the dot which *most often* indicated a

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[28] See above, chapter 2, §1.0, and Wright (1871, ܐ, Bodl. 159 fol. 1a, col. 1).

[29] Medieval Arabic scholars distinguished only three cardinal vowel qualities in Classical Arabic: /a/, /i/, /u/.

type of *a*-vowel—the dot 'above' (*men l'el*)—for their /a/. Naturally, the dot which most often indicated a type of *e-* or *i*-vowel—the dot 'below' (*men ltaḥt*)—became /i/. This vocalisation was first used sparingly, usually on difficult or foreign words and not to fully vocalise a Qurʾān (Abbott 1939, 39; 1972, 9; Dutton 1999, 123). As Dutton (1999, 117) observes, an account in Abū Bakr ibn Abī Dāwūd's (d. 929) *Kitāb al-Maṣāḥif* (*The Book of the Codices*) even suggests that "they were not used for all vowels, but rather those that indicated grammatical endings, or that distinguished two different words (e.g., *fa-mathaluhu* rather than *fa-mithluhu*)." That is to say, they were sometimes used to differentiate homographs that differed only in their vowels, exactly like Syriac.

   With dots already accounting for two-thirds of their vowels (/a/ and /i/), Arabic scribes had no need for an ambiguous relative vocalisation system, and they placed a single intralinear red dot to the left of a letter to represent /u/. Al-Dānī explains the intralinear position for /u/ simply because it was the last remaining space (al-Dānī 1960, 20a),[30] and, as far as I know, there is no evidence for the regular use of a two-dot sign to represent any vowel in Arabic. There is, however, an anomalous papyrus letter from the Khalili Collection in which the writer applies an oblique pair of sublinear dots to designate /i/, or a similarly fronted

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[30] He also claims that there was once a Hijazi practice that marked /u/ with a supralinear dot, /a/ with an intralinear dot, and /i/ with a sublinear dot, but this system is unattested in manuscripts (al-Dānī 1960, 4b–5a; George 2015, 6, 14).

vowel, in five separate instances (MS Khalili Inv. No. 368). Geof-
frey Khan notes that this sign matches the form and usage of the
sublinear two-dot sign that represents /e/ and /i/ in Syriac man-
uscripts from the seventh century onwards, and may be a "loan
from Syriac" in the period before the red-dot system stabilised
(Khan 1992, 43–44, 234–37).[31] He also highlights a papyrus pe-
tition from the same collection in which a dot 'above' marks /ā/
and a dot 'below' marks /ī/, both conspicuously in the same col-
our as the main script (MS Khalili Inv. No. 69) (Khan 1992, 43,
136–40).[32] This matching colouration is irregular, as medieval
Arabic vocalisers explicitly instruct to use different colours for
the dots and main script (hence 'red' dots) (al-Dānī 1960, 2b–3a,
9b). It is worth noting that Syriac scribes often used red and black
inks for different types of dots in the same manuscript, and their
vowel points were usually black or brown (i.e., the same colour
as the script). Both of these papyri documents thus reinforce the
conclusion that the red-dot system is derived from the Syriac di-
acritic dots.

This adaptation of the Syriac relative vocalisation system
to fit the Arabic language could have occurred in several different
ways, including within the scribal bureaucracy of the late Ra-

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[31] For the function of these particular dots in Syriac, see Kiraz (2012,
I:70; 2015, 98–101).

[32] Abbott suspects the Arabic red dots cannot have seen much use in
non-Qurʾānic texts, with the system quickly giving way to the modern
vocalisation system in works of literature and poetry due to the incon-
venience of swapping ink colours (1972, 7–8).

shidun or early Umayyad Caliphate. As Versteegh (1993, 29) remarks, "we know that during the first century of the conquests Arabs had to rely on Christians to handle the archives of the newly founded empire." The lack of a complex Arabic bureaucratic system or written literary tradition in the pre-Islamic period prompted the early caliphate to employ non-Arabic scribes, specifically Greek and Persian, for bureaucratic work until the reforms of ʿAbd al-Malik at the end of the seventh century (Hoyland 2008b, 13–15). Even into the 690s, many of these scribes were bilingual Syriac Christians (Hoyland 2008b, 13, n. 6; King 2012, 196–97), and when ʿAbd al-Malik ordered them to begin keeping records in Arabic, it would have been trivial to transfer the Syriac dots to a vowelless Arabic script. On the other hand, with the possible exceptions of the two papyrus documents mentioned above, both the Syriac dots and the Arabic red-dot vocalisation are practically unattested in non-Qurʾānic texts. It is more likely that the *ʾiʿjām* entered Arabic from Syriac via this pathway, as they are attested earlier than the red dots and do appear in bureaucratic documents (Kaplony 2008).

Another option for the introduction of the red dots is through pedagogical practices aimed at teaching children to read Arabic. Several scholars have observed that in Jacob of Edessa's canons, he accedes that it is permissible for a Christian priest to teach reading and writing to Muslim (and Jewish) children (Merx 1889, 43; Hoyland 2008b, 17). Versteegh (1993, 29) argues that such teacher-student relationships must have existed in the late seventh century, or there would be no need to address such a question. More than likely, these Syrian teachers were teaching

Arabic reading to Muslim children, and we know from Jacob of Edessa's *Turrɔṣ Mamllɔ* that vowel marking was a powerful tool for explaining grammar (see above, chapter 2, §1.0). Similarly, in the years following ʿAbd al-Malik's reforms, Syriac Christian children would have needed to learn Arabic in order to pursue careers in the scribal bureaucracy. In these scenarios, the introduction of Syriac vowel dots to the Arabic script would have occurred in a pedagogical setting, with Syriac-speaking teachers utilising them to educate Arabic-reading children.

More generally, Arabic vocalisation would have spread after the invention of the red dots as a result of pedagogy. Though much later than Jacob of Edessa, al-Dānī records at least one tradition which forbids vowel pointing, *except* for pedagogical purposes. He writes: "Mālik said... As for the little codices which children learn from, as well as their tablets,[33] I do not think [pointing them] is so bad (قال مالك... وأمّا المصاحف الصغار التي يتعلّم فيها الصبيان وألواحهم فلا أرى في ذلك بأساً)" (al-Dānī 1960, 6a).[34] Drawing a brief modern parallel, also note that children's books are the only Arabic texts besides the Qurʾān that are fully and consistently vocalised.

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[33] These were wooden tablets with wax surfaces that students could use to practice writing, then scrape clean to use again.

[34] This was also the rule for medieval Hebrew Bible manuscripts. Personal codices and teaching aides could be vocalised, but Torah scrolls meant for use in synagogues could not (Khan 1990, 54; 2020, I:20). For vocalisation in common Bible codices, see Outhwaite (2020).

Still, the red-dot vowel points are not widely attested in non-Qurʾānic texts, so bureaucratic archives and schoolkids' tablets may not be the most likely entry points for Syriac diacritic dots into the Arabic script. Another possibility is implied by several early *ḥadīth* reports that claim seventh- and eighth-century Muslims hired Christian scribes (or recent Christian converts to Islam) to write copies of the Qurʾān for them (Déroche 2004, 263, n. 83; George 2010, 52–53 and nn. 112–16). These scribes would have first learned Syriac calligraphy before adapting to Arabic, and would have had the perfect opportunity to convert Syriac diacritic dots into an Arabic vocalisation system. Such reports also correlate with the observed Syriac influences on the palaeography and codicology of early Qurʾān manuscripts (George 2010, 34–51). Abū al-Aswad and other late seventh- or early eighth-century scholars would have been aware of these practices, or something similar. Some of them may even have learned to read from native Syriac-speakers before adding red dots to the Qurʾānic text themselves. Moreover, it may be that the comparatively early introduction of an absolute vowel pointing system in Arabic actually accelerated the transition to absolute vocalisation in Syriac during the eighth century.

Regardless of the precise origins of the red dots and ʾiʿjām, it is clear that their inventor(s) modelled them after the Syriac diacritic dots, thereby importing the concept of 'high' and 'low' phonology into the Arabic writing system. Revell was correct to observe that later Muslim grammarians did not always adopt exactly the same principles to describe Arabic, and the difference may be due to the work of al-Khalīl ibn Aḥmad (d. 786/791). If

the older perception of farther-backed articulation points as
'higher' (as evidenced by the *ʾiǧām* positions) became universal
in Arabic, then the 'lowest' consonant should always be the bila-
bial *mīm*. However, the introduction to *Kitāb al-ʿAyn* explains
how al-Khalīl rearranged the letters of the Arabic alphabet to as-
cend in order from back to front:

فأَعْمَلَ فكرَه فيه فلم يمكنه أنْ يبتدىء التأليف من اول ا، ب، ت، ث، وهو
الألف. لأن الألف حرف معتلّ فلما فاته الحرِف الأوّل كَرَهَ أن يبتدىء
بالثاني—وهو الباء—إلّا بعد حُجّةٍ واستقصاء النَّظَر، فدبّر ونظر الى الحروف
كلِّها وذاقَها [فوجد مخرج الكلام كلّه من الحلق] فصيّر أولا بالإبتداء ادخَلَ
حرف منها في الحلق.

وإنما كان ذَواقه إِيّاها أنّه كان يفتح فاهُ بالألف ثم يظهر الحرفَ. نحو اب،
ات، اح، اع، اغ، فوَجَدَ العين ادخَلَ الحروف في الحلق، فجعلها أوّلَ
الكتاب ثم ما قَرُبَ منها الأرفع فالأرفع حتى أتَى على آخرها وهو الميم.

فإذا سُئِلتَ عن كلمة وأردتَ أن تعرِفَ موضِعَها. فانظرْ الى حروف الكلمةِ
فمهما وَجَدتَ منها واحدا في الكتاب المقدَّم فهو ذلك الكتاب.

وقلَّبَ الخليل ا، ب، ت، ث، فوضعها على قدر مخرجها من الحلق وهذا
تأليفه: ع، ح، ه، خ، غ...

So he considered it, for he could not begin his composition
from the beginning of the *ʾalif, bāʾ, tāʾ, thāʾ* [alphabet],
which is *ʾalif*, because the *ʾalif* is a sick letter. But when he
passed the first letter, he was loath to begin with the sec-
ond (which is *bāʾ*) without pretext and careful considera-
tion. He organised and observed all of the letters; he tested
them, [finding the exit of all speech is from the throat].
Thus he made first, at the beginning, the innermost letter
among those in the throat.

His test of them was just that he would open his mouth
with *ʾalif*, then make the letter appear, for example: *ʾāb,
ʾāt, ʾāḥ, ʾāʿ, ʾāgh*. He found the *ʿayn* was the innermost of
the letters in the throat, so he made it the first of the book,

> and then whatever [letter] was next to it was higher, and then higher still until he came to their end, which is the *mīm*.

> So if you were asked about a word and you wanted to know its location [in the lexicon], then examine the letters of the word, and when you find the one earliest in the book, then it is that volume.

> And al-Khalīl inverted the *ʾalif, bāʾ, tāʾ, thāʾ* [alphabet], and he placed them in proportion to [the distance of] their articulation point from the throat. This is his arrangement: *ʿayn, ḥāʾ, hāʾ, khāʾ, ghayn*.... (Makhzumi 1985, I:47–48)

The narrator of this passage—likely al-Khalīl's student, al-Layth ibn al-Muẓaffar (d. 803) (Sellheim 2012; Schoeler 2006, 142–63)—explains that al-Khalīl did not want to arrange his lexicon in the normal Arabic alphabetical order (*ʾalif, bāʾ, tāʾ, thāʾ*), because *ʾalif* is not a sound root letter. He observed that the throat is the source of all speech, and so concluded that *ʿayn* should be the first letter because it is produced deepest in the throat.[35] Then, in contrast to the comparisons found in the relative vocalisation and diacritic systems, al-Khalīl designed a consonantal scale that moves upwards from the back of the mouth to the front (see Revell 1975, 183–84, 190 n. 1; Kinberg 1987, 17–18). He further clarifies this arrangement when he states that the innermost letters are *ʿayn*,[36] *ḥāʾ*, and *hāʾ*, and that "these three are in

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[35] This letter's name is the reason why the lexicon is called *Kitāb al-ʿAyn* (*The Book of the ʿAyn*), but al-Khalīl was also punning on the noun *ʿayn*, which means 'source'.

[36] *Hamza* (glottal stop) is actually articulated farther back than *ʿayn* (voiced pharyngeal fricative), but al-Khalīl considered it one of the 'airy'

one space, each one higher than last (هذه ثلاثة أحرف في حيّزٍ واحد)
بعضُها أرفع من بعض)" (Makhzumi 1985, 57–58). Similarly, he says,
"*qāf* and *kāf* are both velar-uvular, and the *kāf* is higher (ثم القاف
والكاف أرفع، والكاف لهويتان)" (Makhzumi 1985, 58).[37] That is, *kāf* is
farther forward. This consonantal scale remained the alphabeti-
cal order for the lexical entries in *Kitāb al-ʿAyn* even as later schol-
ars compiled it after al-Khalīl's death. The influence of this first
Arabic lexicon may have disrupted the continuity of the earlier
phonological system where 'back' was 'high'.

   Al-Khalīl's work was foundational to the Basran school of
grammar (Talmon 2003, 279), and his consonantal arrangement
appears in the *Kitāb* of his student, Sībawayh (d. 793/796).
Sībawayh expands on this notion equating 'height' with fronted-
ness, and he explicitly incorporates the Arabic vowels into the
order of articulation points. In a chapter on verbs of the *faʿala*
pattern containing pharyngeal consonants that inflect with the
vowel /a/, he writes:

> وإنما فتحوا هذه الحروفَ لأنها سَفلتْ في الحلق، فكرهوا أن يتناولوا حركة
> ما قبلها بحركةٍ ما ارتفع من الحروف، فجعلوا حركتها من الحرف الذي في
> حيّزها وهو الألف، وإنما الحركاتُ من الألف والياء والواو.
>
> وكذلك حرّكوهنَّ إذ كنَّ عيناتٍ، ولم يُفعَل هذا بما هو من موضع الواو والياء،
> لأنّهما من الحروف التي ارتَفعت، والحروفُ المرتِفعةُ حَيِّزٌ على حدةٍ تَتناول
> للمرتفع حركةً من مرتفعٍ، وكُره أن يُتناول للذي قد سَفل حركةٌ من هذا الحيّز.

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letters which lacked an articulation point in the mouth (Makhzumi
1985, 58; al-Nassir 1993, 13–14).

[37] *Kāf* never represented a uvular consonant, so al-Khalīl's term *lahawī*
here designates a region around the back of the tongue between the
uvula and the velum (Alfozan 1989, 10–11; al-Nassir 1993, 11, 41; Bri-
erley et al. 2016, 162–63).

> They [the Arabs] only put *fatḥa* on these letters because they occur low in the throat, and they avoid making the vowel that precedes [the velar/pharyngeal letters] into a vowel of that which is raised above those letters. Thus, they make the vowel from the letter in the same space, namely *ʾalif*. Indeed, the vowels are from *ʾalif*, *yāʾ*, and *wāw*.

> They likewise vocalise [these consonants] when they are in second position, but this is not done in instances of *wāw* or *yāʾ*, because they are both among the letters which are raised up. The raised letters are a separate space. For what is raised up, you only take a vowel that is [also] from what is raised, and taking a vowel from this space for whatever is low should be avoided. (Sībawayh 1986, IV:101)

For Sībawayh, since the consonants *hāʾ*, *ʿayn*, *ḥāʾ*, *ghayn*, and *khāʾ* are articulated far back at the throat, they are the lowest letters. They frequently take the vowel /a/ because it shares a 'space' (*ḥayyiz*) with them. More precisely, /a/ shares an articulation point with *ʾalif* (and thus *hamza*), so it is the vowel that is physically closest to the low consonants. By contrast, if *yāʾ* or *wāw* occur in these same verbal contexts, they usually take /i/ or /u/. This tendency occurs, at least according to Sībawayh, because *yāʾ* and *wāw* are *murtafiʿa* 'raised up', higher in the mouth than the letters articulated in the throat. These raised letters are farther forward, and thus it is easier for them to take /i/ and /u/, which are also 'raised up' at their articulation points (see Kinberg 1987, 16–17). The same explanation appears in Ibn Jinnī's (d. 1002) *Sirr Ṣināʿa al-Iʿrāb*, where he places *fatḥa* (/a/) as the lowest vowel, followed by *kasra* (/i/), and then *ḍamma* (/u/) (Kinberg 1987, 18; Ibn Jinnī 1993, 53–54).

Given the influence that al-Khalīl and Sībawayh's writings had on later Arabic grammarians, it is not surprising that the waters are somewhat muddied with respect to the perceptions of 'high' and 'low' in medieval Arabic linguistics. For indeed, even while al-Khalīl's consonant scale survived in *al-ʿAyn* and the work of some of his successors, there was a concurrent system which considered the velum the highest point in the mouth, and all spaces both in front of and behind it were lower (Kinberg 1987). This system appears much more similar to the *milleʿel-milleraʿ* scale and the Syriac relative vocalisation system, which both identified 'high' vowels as those pronounced farthest back, closest to the velum.

2.2. *Naṣb,* ʾ*Imāla,* and Phonological Height in Arabic

The arrangements of the consonants in the introduction of *Kitāb al-ʿAyn*, Sībawayh's *Kitāb*, and Ibn Jinnī's *Sirr Ṣināʿa al-Iʿrāb* all suggest that they conceived of an ascending scale that located pharyngeals as the 'lowest' letters in contrast to the 'highest' labials (e.g., Ibn Jinnī 1993, 45). However, Naphtali Kinberg has shown that the prevailing perception among Arabic grammarians—including Sībawayh and Ibn Jinnī—is to regard the space between the velum and uvula as the highest point in the mouth. As such, the letters pronounced from articulation points both in front of *and* behind the velum (i.e., palatals, dentals, labials, pharyngeals, glottals) are relatively 'low' (Kinberg 1987, 8). This organisation appears in the work of several later grammarians, but is best summarised by Ibn Jinnī, who classifies all the letters into two groups: *mustaʿliya* 'elevated' and *munkhafiḍa* 'lowered'.

The elevated letters are the velars *khāʾ*, *ghayn*, and *qāf*, as well as the 'emphatic' pharyngealised consonants *ṣāḍ*, *ḍāḍ*, *ṭāʾ*, and *ẓāʾ*. All other letters are lowered, including *hamza*, *ʿayn*, *hāʾ*, and *ḥāʾ* (Ibn Jinnī 1993, 62; Bakalla 2011). Two details stand out here. First, *munkhafiḍa* comes from the same root as *khafḍ* 'lowering', the Kufan name for the genitive case and a name for the vowel /i/ until at least the early ninth century (Versteegh 1993, 18–19). Second, Sībawayh uses the same *mustaʿliya* term and group of seven 'elevated' letters to explain the rules which prevent *ʾimāla* 'bending down, inclination' in the *Kitāb*.

ʾImāla in Arabic is a phonetic phenomenon of fronting a vowel so that its pronunciation approaches /i/. Most often, this occurs with long /ā/ represented by *ʾalif*, resulting in allophonic qualities between /a/ and /i/ (e.g., /ɛ/ or /e/) (Alfozan 1989, 18, 35, 213–16; Levin 2007). Sībawayh's *Kitāb* is the earliest source that describes the comprehensive rules for determining whether or not an *ʾalif* undergoes *ʾimāla*, and he devotes several chapters to it (Sībawayh 1986, IV:117–43). The most common cause is /i/ in an adjacent syllable. Throughout this discussion, Sībawayh refers to the default quality of *ʾalif* (/a/) as *naṣb* 'standing upright' (Sībawayh 1986, IV:123, line 4; Talmon 1996, 291; 2003, 239), while variants in which /a/ is fronted towards /i/ are *ʾimāla* 'bending down'. He usually does this by saying that a speaker 'bends down' (*yumīlu*) or 'sets upright' (*yanṣibu*) the *ʾalif* (Sībawayh 1986, IV:123, 125–26, 127, 143). Some later grammarians also delineated two different types of *ʾimāla*—*ʾimāla khafīfa* 'light inclination' (likely around /ɛ/) and *ʾimāla shadīda*

'strong inclination' (closer to /e/ or /i/)[38]—but Sībawayh does not make that distinction in this section (Alfozan 1989, 18, 35–36; Dutton 1999, 121). However, he does say that some instances of *ʾimāla* are 'weaker' (*ʾaḍʿaf*) (Sībawayh 1986, IV:122), and he mentions 'strong *ʾimāla*' in his section on the alphabet (Sībawayh 1986, IV:432), suggesting his idea of *ʾimāla* encompassed more than one vowel quality. As such, in the *Kitāb* and elsewhere, the term *ʾimāla* has a relative function, and, depending on context, can indicate multiple fronted allophones of *ʾalif* (e.g., /ɛ/, /e/).

   Naṣb is the name for the accusative case in Classical Arabic, but prior to the ninth century it was also a name for /a/, the vowel that most frequently marks the accusative case ending. Evidence for this usage as a vowel name appears in early Qurʾānic exegesis and the lexical sections of *Kitāb al-ʿAyn* (Versteegh 1993, 125–26; Talmon 1997, 157, 194–97; 2003, 235–40). The identification of /a/ with 'standing upright' indicates that the vowel is articulated higher up in the mouth—that is, not fronted, not *ʾimāla* 'bending down'. However, besides /a/ and /e/, Sībawayh includes another allophone of *ʾalif* in this discussion of *naṣb* and *ʾimāla*. He states that the seven *mustaʿliya* letters—*khāʾ, ghayn, qāf, ṣād, ḍād, ṭāʾ*, and *ẓāʾ*—prevent *ʾimāla* when they precede *ʾalif* (see Kinberg 1987, 8–9), explaining:

وإنما منعتَ هذه الحروفَ الإمالةَ لأنها حروف مستعلية الى الحَنَك الأعلى،
والألفُ إذا خرجتْ من موضعها استعلتْ الى الحنك الأعلى، فلما كانت
مع هذه الحروف المستعلية غلبتْ عليها، كما غلبت الكسرة عليها في

---

[38] Sībawayh does not describe the exact quality of *ʾimāla*, so we can only estimate here. See discussion in Levin (2007).

مَساجِد ونحوِها. فلما كانت الحروفُ مستعليةً وكانت الألف تَستعلى،
وقربتْ من الألف، كان العَمَلُ من وجه واحد أخفّ عليهم...

> You prevent *ʾimāla* for these letters because they are letters
> which are elevated towards the upper palate, and the
> *ʾalif*—if it is pronounced from their position—is elevated
> towards the upper palate. When [the *ʾalif*] is adjacent to
> these elevated letters, then they overpower it, just as the
> *kasra* overpowers it in *masējid* and other variations [that
> have *ʾimāla*]. So when the letters are elevated while the
> *ʾalif* elevates, and they are adjacent to the *ʾalif*, then the
> articulation is in a single manner, which is less burden-
> some for them [the Arabs] (Sībawayh 1986, IV:129).

This passage describes the production of a non-*ʾimāla* allophone
of *ʾalif* from the same articulation point as the 'elevated'
(*mustaʿliya*) letters, so called because the back of the tongue is
'elevated' to the high point between the velum and the uvula (Ibn
Jinnī 1993, 62; see Bakalla 2011). A speaker also retracts the
tongue in order to shift the vowel back towards that point, real-
ising it somewhere between /a/ and /o/ (e.g., /ɑ/ or /ɔ/) (al-
Nassir 1993, 97, 103–4; Bakalla 2011). Sībawayh suggests that
this pronunciation is "less burdensome" because a speaker does
not have to move quickly from the high articulation point of the
mustaʿliya letters to the comparatively low articulation point of a
vowel that has undergone *ʾimāla*.

Kinberg interprets this passage to mean that the *ʾalif* rises
towards the velum from a low position in the throat, since that is
the same position as the other *munkhafiḍa* pharyngeal consonants
and the place which Arabic grammarians indicate for the articu-
lation point of *ʾalif* (Kinberg 1987, 9). However, this interpreta-
tion cannot be correct. When Sībawayh says *ʾalif* in this passage,

what he is really describing is not the letter itself, but rather the phoneme /ā/ as represented by a written *ʾalif*. By default, this long vowel has the same quality as /a/, but when it undergoes *ʾimāla* then it is realised between /a/ and /i/. If Sībawayh perceived the default /a/ as being articulated from low in the throat, then it could not 'bend down' towards /i/—it would either rise or remain level. As such, the 'elevation' of *ʾalif* in the passage must be from the articulation point of /a/ in the centre of the mouth, between the points of /i/ and the *mustaʿliya* letters, and up towards the velum.[39] This analogy of the transition from a front vowel to a back vowel as movement from a low position to a high position is the same as that seen in Syriac and Hebrew relative vocalisation. In this Arabic system, *ʾimāla* indicates a downward movement from a default phonemic vowel, while *naṣb* is a comparatively steady or upward movement.

Sībawayh's discussion of *ʾimāla* with the vowel /u/ reinforces this interpretation. He says that one 'bends down' the second vowel in the word *madhʿūr* 'frightened', with the resulting vowel fronted from /u/ to /ʉ/ (Sībawayh 1986, IV:142–43; Alfozan 1989, 143; al-Nassir 1993, 102; see also, Ibn Jinnī 1993, 53). Sībawayh's description is a relative comparison of two allophones, with the more-fronted, 'lower' vowel /ʉ/ explained as 'inclined' or 'bent down' in comparison to the 'higher', more-backed /u/. In fact, as Kinberg notes, the articulation point of /u/ is also at the velum—the same as the *mustaʿliya* letters—so it is the 'highest' vowel (Kinberg 1987, 7–8), and any *ʾimāla* from that

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[39] Though see al-Nassir (1993, 32–33). Sībawayh may not have had a definite sense of the locations of the articulation points of the vowels.

point results in a relatively-fronted vowel between /i/ and /u/ (i.e., /ʉ/). Further reinforcing this position is a note in *Kitāb al-ʿAyn* that equates *rafʿ* 'rising' with *tafkhīm* 'thickening', the term which Sībawayh applies to the backed realisation of an *ʾalif* in a way that resembles *wāw* (i.e., /o/) (Makhzumi 1985, IV, 281; Sībawayh 1986, IV:432; Talmon 1997, 141). *Rafʿ* was also an early name for the vowel /u/, so called because it indicates the relatively high position of the vowel's velar articulation point. It comes from a separate 'high-and-low' dichotomy in Arabic phonology, contrasting with the fronted 'lowering' of *khafḍ* (/i/) (see below, chapter 4, §1.1). Arabic grammarians eventually combined this pair of terms with *naṣb* as a name for /a/, but only after *naṣb* had been established as the phonetic opposite of *ʾimāla*.

Sībawayh also remarks that the *wāw* in *madhʿūr* does not undergo complete *ʾimāla*, "because it does not resemble *yāʾ*, and if you bend it down, then you [actually] bend down what precedes it, but seeking towards /i/ (لأنها لا تُشبه الياء، ولو أملتها أمَلت ما قبلها ولكنّك تروم الكسرة)" (Sībawayh 1986, IV:143; al-Nassir 1993, 102).[40] The implication is that *ʾalif* (and /a/) resembles *yāʾ* (and /i/) more than *wāw* (and /u/), which is why *ʾalif* can undergo more complete downwards inclination. Based on this information, we can estimate that Sībawayh's arrangement of allophonic vowels from low to high would match their approximate order of relative backness: /i/, /e/, /a/, /ʉ/, /ɑ/, /o/, /u/.

At the end of the section on *ʾimāla*, Sībawayh says, "We have heard all that we have mentioned to you, regarding *ʾimāla* and *naṣb* in these chapters, from the Arabs (سمعنا جميع ما ذكرنا لك

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[40] See discussion of *rawm* 'seeking, desiring' below, chapter 4, §1.2.

(من الإمالة والنصب في هذه الأبواب من العرب" (Sībawayh 1986, IV:143).
This comment could be read as an indication that all the examples in the preceding chapters—including those with /ɑ/ and /u/—are classified as either *naṣb* or *ʾimāla*. This usage is actually inconsistent with the terminology that Sībawayh uses in the rest of the *Kitāb*. In one of its first chapters, he specifically details a system to differentiate the vowel names *fatḥ*, *kasr*, and *ḍamm* from the *ʾiʿrābī* case names *naṣb*, *jarr*, and *rafʿ* (Sībawayh 1986, I:13; K. Versteegh 2011).[41] This was a novel distinction, as prior to the *Kitāb*, all of these terms were used interchangeably for both vowel and case names (Versteegh 1993, 17–19, 125; Talmon 1997, 194–97; 2003, 235–40, 283).[42] Following his own rules, Sībawayh avoids using *naṣb*, *rafʿ*, and *jarr* to name non-inflectional vowel phonemes the vast majority of the time (Talmon 2003, 238). The section on *ʾimāla* is thus significant for containing an abnormally high density of instances where he describes the phonology of /a/ and its allophones with terms derived from *naṣb*. He seems to be transmitting an inherited tradition (Talmon 2003, 239) in which *naṣb* and *ʾimāla* were binary terms for describing allophonic pronunciations, without always updating it to match his own terminological system. In this tradition, each term included a range of possible vowel qualities, depending on its specific context, with *ʾimāla* 'bending down' indicating relatively fronted 'low' vowels (e.g., /ɛ/, /e/, /ʉ/), and *naṣb* 'standing

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[41] On all of these terms as vowel names, see below, chapter 4, §1.1.

[42] Talmon suspects that al-Khalīl created the distinction between vowel names and *ʾiʿrābī* terms at the end of his career, just before Sībawayhi wrote the *Kitāb*. See also, Versteegh (1977, 17–18).

upright' indicating relatively 'high' backed vowels (e.g., /a/, /ɑ/, /ɔ/).

Previous scholars have put forth similar explanations for the meaning of these two terms, though they have focused on the idea of *naṣb* as 'stable' in contrast to the 'deviation' of *ʾimāla* (Talmon 2003, 239, n. 2). For example, Morag emphasises the binary relationship between *naṣb* and *ʾimāla*, suggesting that a *manṣūb* allophone is 'stable', while a *mumāl* form is 'deviating' (Morag 1979). This explanation is unconvincing, as *naṣb* means 'standing upright', 'erecting', or even 'elevating' more than 'stabilising' (Kazimirski 1860, 1286; Lane 1863, 2799).[43] If, instead, we take *naṣb* as 'standing upright' to indicate a high position in the mouth, then *ʾimāla* as 'bending down' is the logical antonym for a lower position. Meanwhile, Kinberg (1986, 172) argues that *naṣb* and *ʾimāla* were part of a triad with *tafkhīm* 'thickening, magnifying', indicating either a lack of inclination (/a/), inclination towards the front of the mouth (/e/), or inclination towards the back of the mouth (/o/), respectively. Sībawayh does mention *ʾalif al-tafkhīm* in his account of the alphabet as a variant of *ʾalif* that is opposite to *ʾimāla*. It signifies an apparently Hijazi dialectal shift from /ā/ to /ō/ in the final syllables of *ṣalāt*, *zakāt*, and *ḥayāt* (all written with *wāw* in the Qurʾan) (Sībawayh 1986, IV:432; Alfozan 1989, 259–60; al-Nassir 1993, 91, 103; Talmon

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[43] Lane even notes that *naṣb* can be "a kind of song, or chant, of the Arabs, or of the Arabs of the desert, or poetry such as is commonly recited, well-regulated and set to an air, so called because, in singing or chanting it, the voice is raised, or elevated" (Lane 1863, 2799). See also, Talmon (1997, 197).

1997, 141). However, he does not use the word *tafkhīm* in any of his chapters devoted to *ʾimāla*, not even when describing the quality of *ʾalif* after *mustaʿliya* letters. As such, it does not appear that *tafkhīm* originated as part of a conceptual triad with *naṣb* and *ʾimāla*. It may instead be related to Jacob of Edessa's Greek-influenced classification of /ɔ/ and /o/ as 'thick' (ʿbe), in contrast to 'thinner' vowels like /e/ and /i/ (see above, present chapter, §1.1).

A contrastive, binary origin for *naṣb* and *ʾimāla* can be interpreted with the same height-based associations as the Hebrew and Syriac relative vocalisation systems that correlated height with backness. These systems were contemporaneous with the earliest pre-Sībawayhan Arabic grammarians, and those grammarians could have adopted the same explanations for their vowel phonology from a shared source. The most likely possibility would be an element of the Syriac grammatical tradition that was in contact with the 'Old Iraqi' school of Arabic grammarians (Talmon 2003, xi),[44] which included many of Sībawayh's sources, during the late Umayyad or early Abbasid period (see Versteegh 1993, 28; 2003, 32–33; Talmon 2008, 174–76; King 2012, 195–205, esp. 199–201). Like the early Hebrew and Syriac relative vocalisation systems, the terms *naṣb* and *ʾimāla* likely began as part of an oral teaching tradition to instruct the reading and recitation of modified *ʾalif*s, particularly from a Qurʾānic text that

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[44] This is Talmon's designation for the early milieu of Arabic grammarians in Iraq, prior to the emergence of the distinct 'Kufan' and 'Basran' strains of grammatical thought.

did not have dedicated symbols to represent vowel qualities besides /a/, /i/, and /u/.[45] It seems, then, that Sībawayh recorded, with only minor updates, part of an early relative system that used each of these terms to identify multiple allophones: *ʾimāla* could include /ɛ/ and /e/, while *naṣb* included /a/ and /ɑ/. This vowel terminology was part of the same overarching phonological system that construed the back of the mouth as 'higher' than the front, and which informed the placement of the Arabic consonantal diacritic dots and the red-dot vocalisation system.

3.0. Summary

The earliest systems for describing vowels in Syriac, Hebrew, and Arabic relied on comparisons of vowel qualities, rather than absolute pointing and terminology for indicating each individual vowel. The first extant evidence of this methodology is the Syriac diacritic dot system, which appeared at least as early as the fifth century and distinguished homographic pairs of words according to the relative quality of their vowels. Syriac scribes placed a dot above to indicate a word with relatively open and back vowels, while a dot below marked its homograph with closed and fronted vowels. By the seventh century, multiple diacritic dots could even

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[45] There was a rare practice in early Qurʾān manuscripts to indicate *ʾimāla* by the addition of a green dot, but it is not widely attested (Dutton 1999, 116). In general, the red-dot system could not explicitly mark *ʾimāla*. Later manuscripts include additional symbols for *ʾimāla*, including a *kasra* beneath an *ʾalif* or a small rhombus (Morag 1961, 15, n. 11; Alfozan 1989, 12, n. 33). See also, Connolly and Posegay (2020, 344–45).

indicate multiple vowels within a single word. This system led to an association of 'thick' or 'wide' vowels (e.g., /ɔ/, /o/) with the notion of 'above' (*men lˤel*), and 'thin' or 'narrow' vowels (e.g., /e/, /u/) with 'below' (*men ltaḥt*). In the seventh and eighth centuries, these principles informed the final placements of dots in the Syriac absolute vowel pointing system. Around the same time, the phonological ideas of 'above' and 'below' entered the Masoretic linguistic tradition in the form of *milleˤel* and *milleraˤ* homograph comparisons. The Masoretes used these ideas to create a conceptual 'scale' of vowels, placed according to relative backness within the mouth, with the most-back vowels considered the 'highest' or 'most-*milleˤel*'. They did not adopt the Syriac diacritic dot directly, but in the eighth or early ninth century, the conceptual framework of 'above-and-below' phonology also informed the placement of the dots in the Tiberian pointing system.

In the early seventh century, Arabic scribes—likely influenced by Syriac scribal practices—developed a similar system of diacritic dots to differentiate consonants according to their relative 'height' within the mouth. Then, in the late seventh or early eighth century, this principle informed the adaptation of the Syriac diacritic dot system for the Arabic script as the red-dot vocalisation points. Also around this time, Arabic grammarians developed terminology to instruct allophonic variants of vowels that their script and vocalisation system could not represent. Following a similar arrangement to Syriac and Hebrew scholars, they referred to relatively backed 'high' variants of *ʾalif* (/a/, /ɑ/) as *naṣb* 'standing upright', while 'low' fronted allophones (/ɛ/, /e/) were called *ʾimāla* 'bending down'. However, relative terms like

these were less prominent in Arabic than in Syriac and Hebrew, as the Arabic script could adequately represent the three main Arabic vowel qualities from an early stage. This situation led to a comparatively early adoption of absolute vowel names in Arabic, though often still rooted in the earlier 'high-and-low' relative terminology. Beginning with these Arabic names, we will now explore the emergence of absolute vowel names in all three traditions.