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Cover image: Detail from a bilingual Latin-Punic inscription at the theatre at Lepcis Magna, IRT 321 (accessed from https://it.wikipedia.org/wiki/File:Inscription_Theatre_Leptis_Magna_Libya.JPG). Leaf of a Syriac prayer book with Western vocalisation signs (source: Wikimedia Commons). Leaf of an Abbasid-era Qur'ān (vv. 64.11–12) with red, yellow, and green vocalisation dots (source: Wikimedia Commons). Genizah fragment of the Hebrew Bible (Gen. 11–12, Cambridge University Library T-S A1.56; courtesy of the Syndics of Cambridge University Library). Genizah fragment of a Karaite transcription of the Hebrew Bible in Arabic script (Num. 14.22–24, 40–42, Cambridge University Library T-S Ar. 52.242; courtesy of the Syndics of Cambridge University Library). Greek transcription of the Hebrew for Ps. 22.2a in Matt. 27.46 as found in Codex Bezae (fol. 99v; courtesy of the Syndics of Cambridge University Library).

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CONNECTING THE DOTS: THE SHARED PHONOLOGICAL TRADITION IN SYRIAC, ARABIC, AND HEBREW VOCALISATION

Nick Posegay

1.0. INTRODUCTION

The development of Semitic vocalisation systems spans a massive gulf of time, beginning with the first use of *matres lectionis* letters and continuing to the standardisation of the modern Arabic and Hebrew vowel pointing systems. But the portions most commonly implied by the phrase ‘vocalisation system’—that is, the vowel signs themselves—were invented in the multicultural environment of the early medieval Middle East. Between the seventh and eleventh centuries, historically Aramaic-speaking Jews and Christians faced the challenge of preserving their biblical recitation traditions in the face of the growing dominance of the Arabic language. In the same period, Arab Muslims feared the corruption of the Qur’anic recitation tradition as a result of contact with non-native Arabic speakers.

Adherents to all three religions took steps to protect their languages. Syriac Christians first created a system of diacritic dots to record vowels in the Bible, and soon after, both the Jewish

Masoretes and Arab grammarians implemented dot-based systems for marking vowels. Scholars have debated potential relationships between these dot systems for over a century,¹ often without regard to the chronology of their sources (see below, §3.1).² And indeed, the three vocalisation traditions are linked to such a degree that it is difficult to explain the history of one without putting it in context with the other two. The connections between them, however, are not necessarily graphic, and instead relate to phonological theories and terms that medieval grammarians developed to describe their vowel systems.

This study thus aims to compare the phonological traditions of Syriac, Arabic, and Hebrew to demonstrate how they influenced each other over time. That is to say, it will look at the ways medieval linguists described their own languages, and compare the concepts that they used to discuss vowel phonology. In what follows, §2.0 will establish shared features in the Syriac and Hebrew vocalisation traditions prior to the spread of Arabic as the dominant language in the Middle East. §3.0 will examine the emergence of eighth-century Arabic phonetic terminology and its relationship with Syriac. Then §4.0 will explore some ways in which tenth- and eleventh-century Syriac and Hebrew grammarians blended Arabic phonological concepts into their own linguistic traditions.

¹ Haupt (1901); Abbott (1939); Blake (1940); Segal (1953); Revell (1975); Versteegh (1993); Dotan (2007).

² Revell (1975, 181); Versteegh (1993, 30).

2.0. THE HEBREW-SYRIAC CONNECTION

2.1. Early Syriac Relative Vowel Phonology

Some of the earliest descriptions of a Semitic vocalisation system come from Jacob of Edessa (d. 708), a Syriac Christian bishop whose grammatical writings reflect a combination of Greek influence and native Syriac concepts. Three works in particular are crucial for understanding the history of Syriac phonology: his grammatical tract ‘On Persons and Tenses,’ his ‘Letter on Orthography’ to George of Sarug (Phillips 1869), and his grammar, the *Turroṣ Mamllō Nahrōyo* ‘The Correction of Mesopotamian Speech’ (Wright 1871), of which only six folios survive.

Jacob addresses vowel phonology in the introduction of ‘On Persons and Tenses,’ writing:

וְכֵן הָיָה הַלֵּשָׁה . וְכֵן הָיוּ הַמִּשְׁמָרִים הַשְׁלֹשָׁה : הַחֵטַף מֵלֵךְ וְהַבֶּטֶן
 הַמִּשְׁמָר * וְהַחֵטַף הַבֶּטֶן הַחֵטַף הַמִּשְׁמָר . אֵתֵּן הָיָה
 וְהַחֵטַף הַחֵטַף הַחֵטַף מֵלֵךְ . וְהַחֵטַף הַחֵטַף הַחֵטַף * אֵתֵּן
 הָיָה וְהַחֵטַף הַחֵטַף הַחֵטַף * אֵתֵּן הַחֵטַף הַחֵטַף וְהַחֵטַף
 הַחֵטַף : אֵתֵּן הַחֵטַף הַחֵטַף הַחֵטַף לֹא הַחֵטַף הַחֵטַף הַחֵטַף
 הַחֵטַף הַחֵטַף הַחֵטַף לֹא הַחֵטַף הַחֵטַף . אֵתֵּן הַחֵטַף הַחֵטַף

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. This is called ‘restraining’. (Phillips 1869, 1)

This passage shows that Jacob understood vowel phonology according to a relative classification system. Within this system, every word has a particular set of vowels that is comparatively different from the vowels of its homographs. These vowels are not absolutely defined, but rather for a given pair of homographs, Jacob would describe one as more *ḥe* ‘thick’ or *pte* ‘wide’, while the other would be more *nqed* ‘pure’ or *qattin* ‘narrow’. Based on examples later in the text (Phillips, 1), vowels most often associated with the ‘dot above’—i.e., relatively ‘thick’ vowels—were /ɔ/, /o/, and /a/. Meanwhile, those marked with a ‘dot below’—the relatively ‘thin’ vowels—were usually /u/, /i/, /e/, and /ɛ/. However, these attributions were not absolute. It seems that while Jacob interpreted vowel phonemes in terms of relative bulk or openness, he did not use any terms or graphemes to indicate particular vowels on a one-to-one basis. A vowel that was considered ‘wide’ in the context of one homograph could be called ‘narrow’ when compared to another.

Jacob complicates this two-way relative system by the inclusion of *meṣʿay* ‘intermediate’ vowels, which can only be identified in words that have at least two homographs. Such vowels are represented by ‘two points, one above and one below,’ which Jacob refers to as *mpaggdwn* ‘restraining, bridling’. This term seems to describe only the physical two-dot grapheme, while the vowel phoneme itself is called *meṣʿay*. This term almost always indicates the vowel /a/, but more importantly, it has no inherent descriptive qualities, and any *meṣʿay* phoneme could be called *pte* or *qattin* in another context. It seems then that Jacob added

the *meṣʿyṣ* term to his vowel phonology to align it with his understanding of consonants, which, in his grammar, he categorises as *ʿabyṣṭ* ‘thick’, *meṣʿyṣṭ* ‘intermediate’, and *neqdṣṭ* ‘thin, clear’ (Wright 1871, ٢٤). E. J. Revell (1972, 367) suggests that Jacob adapted these terms from Greek descriptors that meant, respectively, ‘rough’, ‘intermediate’, and ‘smooth’ with regard to voicing, modifying them to suit the Syriac language (see also Knudsen 2015, 77). As such, *meṣʿyṣ* was likely an addition to pre-existing Syriac vowel phonology—one based solely on relative degrees of bulk or openness—in order to fit Jacob’s wider Greek-inspired system.

From this information, we can assume that Jacob of Edessa built on an older phonological tradition that used terms like *ḥe*, *pte*, *qattin*, and *nqed* to describe vowels relative to each other, but not to name them. Since *ḥe* and *nqed* were probably calques from Greek, examining *pte* and *qattin* may provide further insight into how early Syriac phonologists perceived vowel quality. These latter two terms appear to be descriptions of the lips while articulating vowels. For example, the mouth is relatively wide (*pte*) when one says /a/, whereas it is narrow (*qattin*) when saying /e/. Similarly, the lips open wider for /e/ and /o/ than they do for /i/ and /u/. Curiously, similar descriptions occur in the earliest work of the Hebrew Masoretes.

2.2. Early Masoretic Relative Vowel Phonology

In an article on the etymology of Hebrew vowel names, Richard Steiner (2005, 379–80) argues that terms based on the roots *pth* ‘opening’ and *qmṣ* ‘closing’ predate all other Hebrew vowel

names, and that in their original form they distinguished minimal pairs of vowels according to lip movement. His main evidence for the relative antiquity of these two vowel terms is their appearance in the *Masora magna* and *parva*, as well as the fact that modern *pataḥ* and *qamaṣ* originated as the Aramaic active participles *pōtaḥ* and *qōmeṣ* (Steiner 2005, 374; 377–78; see also Khan 2000, 24). Meanwhile, the remaining names for Hebrew vowels are not in the *Masora*, and are contrived from later Hebraisms. Both of these features indicate that terms from *pṯḥ* and *qmṣ* emerged in the eighth century, perhaps earlier, and Aron Dotan (1974) has identified rare usages of these roots to distinguish vowel pairs other than /a/ and /ɔ/ (see also Steiner 2005, 379). Both Steiner and Dotan thus conclude that the early Masoretes developed a relative system for describing vowels, as the latter writes:

It would appear that this use of the terms קמץ and פתח occurred during a most ancient period, a time when these terms were not as yet serving to denote definite vowels. The vestiges of this use, both of the terms מלרע, מלעיל and the terms קמץ, פתח indicate that in the period which preceded the invention of the vowel signs such a method of relative notation of vowels was current. It was therefore necessary to indicate the vowels which distinguish between homographs. (Dotan 1974, 32)

This relative usage disappeared by the tenth century at the latest, when Hebrew vowels were reclassified according to backness and airflow, as will be shown below. Syriac underwent a similar development around the turn of the eighth century, with phonetic backness becoming associated with ‘height’.

2.3. The Pre-Arabic Relative Context

The lack of absolute vowel notation prior to the eighth century gave rise to homograph lists in Syriac and Hebrew. In the Hebrew tradition, these lists divided homographic pairs according to stress, separating them with the Aramaic terms *mille'el* 'above' and *millera'* 'below'. One of the first scholars to examine these concepts was Heinrich Graetz, who attempted to connect the Tiberian Masoretic tradition to Syriac on the basis of diacritic dots. He studied the homograph lists in *Okhla we-Okhla* and found that, in addition to their normal meanings related to stress, the terms *mille'el* and *millera'* were sometimes used to distinguish Hebrew homographic pairs that differed by one vowel (Dotan 2007, 622–23). By analogy with the Syriac diacritic 'dot above' and 'dot below', Graetz identified this usage as part of a relative vocalisation system. Both Steiner and Dotan also see these terms as evidence of the earlier two-way, relative perception of vowels (Steiner 2005, 379; Dotan 1974). However, Graetz took an additional step, hypothesising that *mille'el* and *millera'* referred to diacritic dots that, just as in Syriac, were placed above or below a Hebrew word to indicate the relative quality of its vowels (Dotan 2007, 622–23). The problem with this idea is that a diacritic dot has been attested only once in the context of Hebrew *mille'el* and *millera'* lists, and in that manuscript the dot indicates stress, not vowel quality (Steiner 2005, 379; Dotan 2007, 623). Graetz's theory also requires that the terms themselves were borrowed from Syriac, and that they persisted after the apparent 'disappearance' of the hypothesised Hebrew diacritic dots.

וְהָיָה יוֹם חַדְשׁ הַחֹדֶשׁ אֶחָד עָשָׂר. וְהָיָה יוֹם הַחֹדֶשׁ אֶחָד עָשָׂר. וְהָיָה יוֹם הַחֹדֶשׁ אֶחָד עָשָׂר. וְהָיָה יוֹם הַחֹדֶשׁ אֶחָד עָשָׂר.

A word with thick vocalisation takes a dot *men l'al* ‘above’, while its thinner homograph is *men ltaht* ‘below’. Jacob’s meaning here is clear, but these two prepositional phrases do not follow the typical Syriac practice of indicating above and below. Normally, one would expect the respective phrases *l'al men(h)* or *ltaht men(h)* in this situation, and indeed that is what Jacob writes when he describes locations of diacritic dots in his ‘Letter on Orthography’ (Phillips (1869, ٣, lns. 13–14; ٤, lns. 2–3; for an example unrelated to diacritic dots, see ٤, ln. 16: the art of writing ‘is *l'al men* all arts’). Jacob does not use *men l'al* and *men ltaht* to discuss regular diacritic dots, but rather applies these phrases only to locate dots that are *specifically* related to vowels. That is, *men l'al* and *men ltaht* are somehow unique phrases that have additional meaning related to vowel phonology. Furthermore, as is typical of Syriac, the second half of the above sentence does not repeat the word *nuqṣo* ‘dot’, such that in a vacuum the line could be read, ‘Then what is small or thin is below.’ The phrase *men ltaht* thus *appears* to have an abstracted categorical

usage, classifying the words it describes according to some conceptual 'low' quality. In the fourth chapter of 'On Persons and Tenses,' i.e., 'Sounds,' Jacob writes:

[illegible]

Above are, for example, *shmayyɔw*, *ʿɔɓɓɔ*, *ɓɔɓɔ*, *ʿab-baɓɔ(?)*,³ *malkɔ*, and *ɬɔɓɔ*. Then below are *shamminɔ*, *ʿaɓɓɔ*, and *ɬɛɓɔ*. (Phillips 1869, ɫ)

While his intention is undeniably to describe dot locations, Jacob does not use the word *nuqzə* with these instances of *men l'al* and *men ltaht*. The prepositional phrases simply categorise the example words as ‘above’ and ‘below,’ according to the two types of vowels. That is, the phrases serve as phonological terms, rather than descriptors of dot position. This development, which seems to have been on the verge of completion during Jacob’s life, may be the origin of the later Syriac phonological system that associated phonetic backness with height (Revell 1975, 181).

At the end of the manuscript, the copyist inserts a brief passage that had been omitted from the introduction:

אהבתי ויהי לי חתן ויבחרתי לו חתן ויבחרתי לו חתן ויבחרתי לו חתן
 ויבחרתי לו חתן ויבחרתי לו חתן ויבחרתי לו חתן ויבחרתי לו חתן
 ויבחרתי לו חתן ויבחרתי לו חתן ויבחרתי לו חתן ויבחרתי לו חתן

³ According to Jacob's system as laid out in his introduction, at least one of these words should be *meş'ay*, but he calls them all *men l'al*. The third word from the root 'bd should possibly be omitted. I suspect some of the dots were not faithfully copied from Jacob's autograph.

Then, again, as for the sounds which indicate *ʿenə ʿemret* and *ʿeʿbeḏ*, and all the rest that are like them, and moreover, regarding *ʿeddun*, they have points below. Then those [sounds] which indicate *ʿamar* and *ʿəkel*, and the rest, they are above. (Phillips 1869, 32, fn. i)

Phillips suspects that these instances of *men l'al* and *men ltaḥt* should be reversed, in order to conform to the more common usage of diacritical dots that distinguish between first- and third-person verbs.⁴ However, the passage does not begin ‘as for the dots which indicate,’ but rather ‘as for the *sounds* which indicate,’ and, as such, the text should be interpreted in terms of the phonological system that Jacob has already explained. Through this lens, the syntactic placement of *men l'al* and *men ltaḥt* makes sense: the first-person *ʿemret* (G perfect) and *ʿeʿbeḏ* (G imperfect) have ‘thinner’ vowels than their respective third-person homographs, *ʿemrat* (G perfect 3fs) and *ʿaʿbeḏ* (C perfect 3ms), so they ought to take a dot below. It seems that the copyist put dots above the first-person verbs according to the standard diacritic practice, as Phillips expected, even though, in this case, the dots that Jacob describes as *men l'al* and *men ltaḥt* were meant to convey relative vowel quality. The following examples—the participles *ʿamar* and *ʿəkel*—are thus correctly classed as *men l'al*, as the dot above distinguishes them from their respective homographs in the perfect, *ʿemar* and *ʿekal*. So again, in a case related specifically to vowel phonology, Jacob uses the uncommon constructions *men l'al* and *men ltaḥt* in such a way that they appear to be

⁴ First-person singular takes a diacritic dot above, and third-person feminine singular takes a dot below.

phonological terms, conceptually divorced from the dots they once described.

Recalling Dotan's stance on the potential relationship between Syriac and the terms *mille^çel* and *millera^ç*, he (2007, 623) asserted that such terms "do not exist and never did exist in the supposed source language, Syriac." But Jacob of Edessa instructs that words with thick vowels take a dot *men l'al*, while those with thin vowels take a dot *men ltaḥt*. Those particular phrases flirt with a theoretical usage, almost describing the phonology of words affected by dots, rather than the dots themselves. While still not explicit vocalisation terms, such descriptors mirror *mille^çel* and *millera^ç*, at least on a conceptual level. It is possible that the Syriac phrases collapsed over time, with the *nūn* in *men l'al* eliding to produce a geminated *lamed* in something like *mille^çel*. Similarly, *men ltaḥt* can be calqued as *men lra^ç*, which could collapse to *millera^ç*.⁵ Simultaneous with this etymological shift, the Syriac terms became dissociated from the physical dots, becoming adjectives expressing the relative qualities of vowels. If this is the case, then the lack of attested evidence for the Hebrew dots hypothesised in Graetz's theory is not irregular, but rather expected. That is, by the time the phrases *men l'al* and *men ltaḥt* had a chance to become phonological terms in Syriac (c. 700–750), they had already lost their meaning related to dots. Consequently, the Masoretes could have adopted them without copying the Syriac diacritics. I know of no primary source that explicitly describes such a development, but Dotan is perhaps too quick to dismiss a Syriac connection.

⁵ I.e., *men l'al* > *mille^çel*; *men ltaḥt* > *men lra^ç* > *millera^ç*.

These similarities between the Syriac and Hebrew linguistic traditions suggest that the early Masoretes understood vowel phonology in much the same way as their Syriac Christian contemporaries. Both traditions qualified vowel phonemes on a hierarchy according to the relative openness of the mouth during articulation. For the Syrians, this meant that vowels could be *pte* ‘wide’ or *qaṭtin* ‘narrow’ when compared to other vowels. Some early Masoretes also applied this principle, and described those same vowels as *potaḥ* ‘opening’ or *qameṣ* ‘closing’. Moreover, there is even evidence that both traditions used Aramaic terms, i.e., *mille‘el* ‘above’ and *millera‘* ‘below’, in some form to delineate between homographs with different vowels, suggesting that the terms may have entered into masoretic usage as Syriac loans. Over time these terms likely contributed to the association of height with phonetic backness in the Syriac and masoretic traditions. This concept eventually appeared in Saadya Gaon’s *Kutub al-Lugha* (Skoss 1952; Dotan 1997), which will be discussed below.

3.0. THE DEVELOPMENT OF ARABIC VOWEL TERMINOLOGY

3.1. The Chronology of Arabic Vowel Names and Their Relationship to Syriac

The Arabic grammatical tradition emerged in this world of two-way relative descriptions, and early Arabic sources on vowel phonology reflect that context. They do not, however, indicate a wholesale borrowing of Syriac phonetic terms that became the Arabic vowel names (Versteegh 1993, 28–31; Talmon 2003, 289–91).

C. H. M. Versteegh has identified a Qurʾanic *tafsīr* by Muḥammad al-Sāʾib al-Kalbī (d. 763) as the earliest source for Arabic vowel names. In it al-Kalbī lists variant readings of the Qurʾan using unpointed Arabic, so he describes alternative vowels using words, rather than signs. In the sixty-eight variants that he records, al-Kalbī uses *kasr*, *jarr*, and *khafḍ* to describe *i*-vowels, *fath* and *naṣb* for *a*-vowels, and *ḍamm* and *rafʿ* for *u*-vowels (Versteegh 1993, 125). Versteegh (1993, 126) notes that at this stage there was no consistent distinction between what are now considered vowel names (*kasr*, *fath*, *ḍamm*) and declensional terms (*jarr*, *khafḍ*, *naṣb*, *rafʿ*), and concludes that “the later terms for the case endings were once part of a system to indicate vowels.” He takes these seven terms and compares them to the list of Syriac vowel names published by Adalbert Merx in 1889 (Versteegh 1993, 29–31), which Merx (1889, 50) collected based on what Gregory bar Hebraeus (d. 1286) wrote about what *he* claimed were the names of vowels used by Jacob of Edessa (d. 708). To say that this chain of transmission is tenuous would be generous.

Versteegh suggests that five vowel names in Bar Hebraeus’ grammar—*ptḥō*, *zqḥō*, *rhōṣō*, *hbōṣō*, *ʿṣōṣō*—are the source of the Arabic terms *fath*, *naṣb*, *khafḍ*, *kasr*, and *ḍamm*. While he is correct in pointing out parallels between the two sets of terms, incorporation of the Syriac sources from before the thirteenth century reveals a more complicated picture. The most obvious connection is the pair of *ptḥō* and *fath*, cognates that mean ‘opening’. Similarly, *ʿṣōṣō* and *ḍamm*, while not cognates, both mean ‘contracting’, and *hbōṣō* and *kasr* can both (loosely) mean ‘pressure’ (Versteegh 1993, 30). The problem, then, is a chronological one.

As we have already seen, Jacob of Edessa did not name any Syriac vowels, and only thought of them as relatively open or closed. There is no evidence that he had a word like *ḥḃṣṣo* or *kasr* to indicate a third type of vowel, and in fact when Jacob of Edessa uses the root *ḥḃṣ* in his ‘Letter on Orthography’, it indicates an orthographic contraction rather than anything phonological (Phillips 1869, ٣, ln. 17). The earliest example of the use of the root *ḥḃṣ* in relation to a vowel seems to come from Elias of Tiran’s (d. 1049) grammar (Baethgen 1880, ٣٥; see below for the use of *ḥḃṣ* for both /u/ and /i/), and it is not clear that either he or Elias of Ṣoba (d. 1049) used *ṣṣṣo* as a vowel term at all. As such, while the dual concepts of vowel ‘opening’ (and thus *pṯḥ*) and ‘contracting’ could have entered Arabic from Syriac in the eighth century, the terms *ḥḃṣṣo* and *ṣṣṣo* are much later inventions, possibly calqued from *kasr* and *ḍamm* into Syriac. In any case, they cannot be the direct source of the Arabic vowel names. On the other hand, it would not be surprising if some of the earliest vowel descriptions in the Syriac, Arabic, and Hebrew traditions were all independently derived based on mouth movement. For example, *pte* ‘wide’ and *qattin* ‘narrow’ in Syriac, *fath* ‘opening’ and *ḍamm* ‘contracting’ in Arabic, and *pṯḥ* ‘opening’ and *qmṣ* ‘closing’ in Hebrew.

Versteegh’s treatment of *zqṣṣo* and *ṣṣṣo* is more problematic. He attempts to explain their relationship to Arabic, writing:

The other phonetic concept that can be reconstructed from the terminology is that of the progressive lowering (of the tongue?) towards the front of the mouth. According to Revell (1975:181), sounds at the back of the mouth are regarded by the Syriac grammarians as high, those at the

front as low. Thus, the grammarians used the terms *zqāphā* ‘raising’ and *rbāšā* ‘lowering’ for *ā* and *ē*, respectively.⁶ These vowels were indicated by a supralinear dot (*ā*) and a sublinear dot (*ē*), corresponding to their relative height. It is obvious that the position of the vowel dot in the Abu al-Aswad story⁷ is in accordance with this Syriac practice. It is equally obvious that the Arabic terms *naṣb* and *khafḍ*, as well as *rafʿ*, may be interpreted lexically in the same sense as the Syriac terms. (Versteegh 1993, 30)

Versteegh accepts Revell’s idea that Syriac grammarians perceived sounds at the back of the mouth as ‘high’. This concept of phonetic ‘height’ is likely a natural development from the earlier Syriac context, which created terms from *men lʿal* and *men ltaḥt*. Versteegh and Revell, however, assume that the principle of ‘high’ and ‘low’ vowel sounds entered the Arabic tradition along with calques of *zqāphā* and *rbāšā*; that is, *naṣb* and *khafḍ*. This conclusion is untenable on both chronological and linguistic grounds. The root *zqp* in the context of vowel phonology is not attested in any Syriac source before a commentary written by Ḥunayn ibn Isḥāq (d. 873), a century after *naṣb* appeared in al-Kalbī’s *tafsīr* (Hoffmann 1880, 10, ln. 13; 14, lns. 21–23). The

⁶ I have left Versteegh’s spelling of *zqāphā* and *rbāšā*, as well as his use of *ā* and *ē* with macrons to transcribe the ‘long’ Syriac vowels, which is the traditional system for writing Syriac in Latin script. However, strictly speaking, the Syriac terms themselves do not indicate vowel quantity, and when the medieval sources say *zqāphā* they almost invariably mean a vowel with the quality /ɔ/ as distinct from /a/.

⁷ This refers to ʿAbu al-ʿAswad al-Duʿalī, who supposedly invented the Arabic red-dot vowel system in the late seventh century.

earliest source I know of with *rbṣ* in a similar context is Elias of Ṣoba's eleventh-century grammar, again, well after al-Kalbī (Gottheil 1887, 7–8). That said, while the Syriac terms *zqṣpō* and *rbṣō* cannot be the source of Arabic *naṣb* and *khafḍ*, respectively, Arabic grammarians did incorporate some height-based principles into their explanations of vocalisation.

3.2. Early Vowel Phonology in the Arabic Tradition

After completing the list of the twenty-nine Arabic letters in his grammar (the *Kitāb*), Sibawayh (d. 793 or 796) says that there are actually thirty-five letters,⁸ some of which branch off of the others. Two of these additional letters are “the *ʿalif* which is tilted with great *ʿimāla*” and “the *ʿalif* of *tafkhīm*” (Harun 1982, IV:432: (ألف التخميم and ألف التي تُمال إمالة شديدة). Here *ʿimāla* ‘inclination, bending down’ indicates the shift of an *ʿalif* towards /i/, such that the resulting sound is not /a/, but /ɛ/ or /æ/. Its opposite is *tafkhīm* ‘magnifying, thickening’, which indicates the shift of /a/ towards /ɔ/.⁹ This term may be related to the principle that Jacob of Edessa illustrated with his classification of /ɔ/ as a *ḥe* ‘thick’ vowel.¹⁰ But beyond this similarity, Rafael Talmon points out that Sibawayh uses another term specifically to indicate an *ʿalif* that does *not* undergo *ʿimāla*: *naṣb* (Talmon 1996, 291; 2003, 239).

⁸ He ultimately concedes that there are forty-two, but this is not relevant to the present discussion.

⁹ An example of *ʿimāla* is the shift towards /i/ that happens to *tāʾ mar-būṭa* in certain Arabic dialects. The first vowel in *ṭālīb* is an example of *tafkhīm*.

¹⁰ *Tafkhīm* is also known as *taghlīz* ‘thickening, becoming coarse’.

Apparently, at some very early stage, *naṣb* and *ʿimāla* were contrastive terms that distinguished the allophonic variants of *ʿalif*.

The use of *naṣb* and *ʿimāla* to describe *ʿalif* probably began well before Sībawayh wrote the *Kitāb*, perhaps even before any Arabic vowels had absolute names. The main evidence for this conclusion comes from the first chapter of the *Kitāb*, where Sībawayh presents a systematic usage for the Arabic vowel names *fath*, *kasr*, and *ḍamm* as distinct from the case names *naṣb*, *jarr*, and *rafʿ*. Prior to his time, all of these terms could indicate both vowels and cases, as seen in the work of al-Kālbi (Versteegh 1993, 125). Sībawayh was the first person to separate the two sets (Talmon 2003, 283),¹¹ relegating *fath*, *kasr*, and *ḍamm* to the status of phonological descriptors, whereas the so-called *ʿiʿrābī* ‘declensional’ terms were reserved for vowels with grammatical import. Sībawayh’s use of *naṣb* to indicate the quality of *ʿalif* is thus anomalous: according to his own instructions, it is a declensional term, and not a word for describing internal vowels. This inconsistency suggests that the duality of *ʿimāla* and *naṣb* was fixed in the Arabic tradition long before Sībawayh isolated *naṣb* as the name for the accusative case, and he is merely transmitting this early convention when he uses *naṣb* to describe an allophone of *ʿalif* (see Harun 1982, IV:125–26, 143, for this contrastive use of *ʿimāla* and *naṣb*).

Sībawayh includes one other variant of *ʿalif* in his discussion of *naṣb* and *ʿimāla*. He first states that there are seven letters

¹¹ Talmon suspects that al-Khalil may have created the distinction near the end of his life, just before Sībawayh wrote the *Kitāb*.

which prevent *ʾimāla* when they precede *ʾalif*: *ṣād*, *dād*, *tāʾ*, *ẓāʾ*, *ghayn*, *qāf*, and *khāʾ*, and then explains:

وإنما منعت هذه الحروف الإمالة لأنها حروف مستعلية الى الحنك الأعلى،
والألف إذا خرجت من موضعها استعلت الى الحنك الأعلى، فلما كانت مع هذه
الحروف المستعلية غلبت عليها، كما غلبت الكسرة عليها في مساجد ونحوها.
فلما كانت الحروف مستعلية وكانت الألف تستعلي، وقربت من الألف، كان
العَمَلُ من وجه واحد أخفّ عليهم...

You abstain from *ʾimāla* for these letters because they are letters which are elevated towards the top of the palate, and if the *ʾalif* is pronounced from their point of articulation, it goes up towards the top of the palate. Thus, when [the *ʾalif*] is with these elevated letters, they overpower it, just as the *kasra* overpowers it in *masājīd*¹² and other variations [that have *ʾimāla*]. So when the letters are elevated, and the *ʾalif* goes upwards, and [the letters] draw near to it, then the articulation is in a single manner, which is less burdensome for them. (Harun 1982, IV:129)

This passage describes the production of a backed *a*-vowel that, like *ʾimāla*, only occurs in specific phonological contexts. In this case, that context is immediately after a velar or emphatic consonant, and the vowel itself requires shifting the articulation of /a/ back towards the soft palate, approximating /ɑ/ or /ɔ/. Given that Sībawayh highlights the parallel between this vowel and *ʾimāla*, one might expect him to call it *ʾalif al-tafkhīm*, as he does in his description of the alphabet; but he does not. In fact, the term *tafkhīm* does not appear anywhere in this or any other of the *Kitāb*'s chapters on *ʾimāla*. Instead, this backed version of

¹² Or *masājīd*, as it happens.

ʾalif is included along with just one of many irregular situations that affect the normal ʾimāla rules. If Sībawayh is indeed transmitting an earlier phonological tradition that contrasted *naṣb* and ʾimāla, then perhaps that tradition did not have terminology to distinguish /a/ from /ɔ/, and instead referred to both as *naṣb*—that is, ‘not ʾimāla.’ As such, *naṣb* and ʾimāla were effectively relative vowel terms, each indicating a particular allophone as either relatively fronted (ʾimāla—/ɛ/, /æ/) or relatively backed (*naṣb*—/a/, /ɑ/, /ɔ/). This usage of *naṣb* (standing upright) and ʾimāla (bending down) thus conforms to the two-way relative descriptions of vowels in the early Syriac and Hebrew traditions, paralleling the association of ‘high’ with backness and ‘low’ with frontedness.

The term *naṣb* must have become associated with the specific quality of an unaltered ʾalif—/a/—prior to al-Kalbī’s time. Then, by analogy with *naṣb* and according to the understanding of back vowels as ‘higher’, *rafʿ* ‘rising’ and *khafḍ* ‘lowering’ were linked to /u/ and /i/, respectively. Throughout this process, *naṣb* retained its now-secondary use as the opposite of ʾimāla, as evidenced by Sībawayh’s *Kitāb*, and, by extension, it retained some function as a way to denote /ɑ/ in certain contexts. It seems then that *naṣb* is the likely source of Syriac *zqp* ‘standing upright’ as a descriptor of /ɔ/, first seen in Ḥunayn ibn Iṣḥāq’s commentary, mentioned above. Syriac grammarians had a concept of ‘openness’ in their vowel phonology as early as Jacob of Edessa, so when they began naming their vowels, *pṛtaḥ*—later, *pṛḥ*—was

the obvious term for /a/.¹³ Then when ninth-century Syrians needed a way to describe their *secondary a*-vowel, /ɔ/, they looked to their Arabic contemporaries, and calqued the second term which they used to distinguish *a*-vowels (i.e., *naṣb*). The results were *zɔqeḇ* and *zqiḇɔ*, which became *zqɔḇɔ* ‘standing upright’ by the eleventh century.

This process also fits Versteegh’s expected development of the vowel term *rbɔṣɔ*, which, in direct contrast to *zqɔḇɔ*, he suggests can mean ‘lowering’. As such, one could conclude that when Syriac grammarians needed a term for their secondary *i*-vowel, /e/, they calqued the second Arabic term for *i*-vowels, *khafḍ* ‘lowering’. The Syriac root *rbṣ*, however, does not exactly mean ‘lowering’ or ‘depressing’ as a physical motion, but rather refers to ‘compression’, and the vowel name *rbɔṣɔ* probably derives from the articulation of /e/ with relatively compressed lips in comparison to more-open vowels. Neither is it attested as a vowel descriptor in Syriac before grammars of the eleventh century, which complicates this reconstruction of the term’s origin. Furthermore, these later sources—particularly Elias of Tirhan’s grammar—may also have incorporated an Arabic tripartite division of vowels into the older Syriac relative vowel system, further distorting the picture.

¹³ The earliest explicit use of this root for a Syriac vowel is in Ḥunayn ibn Ishāq’s commentary, but a more implicit usage appears in the work of David bar Paul (d. c. 800; see Gottheil 1893, cxii, ln. 6–cxiii, ln. 3).

3.3. Reinterpretation of Vowel Phonology in the Arabic Grammatical Tradition

According to Versteegh and Revell's argument, when Arabic grammarians adapted the Syriac vowel dots for Arabic, they also calqued their vowel terms, using a Syriac theory of 'height' that was linked to phonetic backness. As discussed above, there is no terminology in the early Syriac tradition that supports the idea that the Arabic case names are calques of Syriac terms, but the Arabic vowel names are certainly related to some phonological conception that relates backness to height. Arabic grammarians, however, reinterpreted this earliest vowel phonology, and instead explained non-consonantal phonemes based on physical motion, specifically associating them with the movement of air-flow during articulation.

In contrast to the idea of height-as-backness, Ilan Eldar proposes that medieval Arabic grammarians understood vowel phonology as effects on air. Taking into account how *rafʿ* 'rising' usually indicates a high position, whereas *naṣb* describes something which is set upright (Eldar 1983, 45), he argues that *naṣb*, *rafʿ*, and *khafḍ* 'lowering' were interpreted in terms of the direction of airflow during vowel articulation. He focuses on the relationship between Arabic case names and Hebrew vowel phonology (see below), but for now it is sufficient to explain his theory with respect to Arabic. In short, /a/ is called *naṣb* because when one articulates it, the flow of air proceeds straight ahead, unimpeded; it is thus 'fixed in place' or 'standing upright'. By contrast, when articulating /u/, the airstream moves upwards; it is *rafʿ*. Then for

/i/, the air tilts downwards, making it *khafḍ*.¹⁴ Eldar points out that Sībawayh (d. 796) emphasises the relationship between vowel sounds and air (Eldar 1983, 48). In his description of the alphabet in the *Kitāb*, Sībawayh writes:

ومنها الَّيْنَةُ وهي الواو والياء لأنَّ مُخْرَجَهُمَا يَتَّسِعُ لهَوَاءُ الصَّوْتِ أَشَدَّ مِنْ اتِّسَاعِ
غَيْرِهِمَا كَقَوْلِكَ وَأَيُّ وَالِوَاوِ وَإِنْ شِئْتَ أُجْرِيتِ الصَّوْتِ وَمَدَدَتْ
ومنها الهَاوِي وهو حَرْفٌ اتَّسَعَ لهَوَاءُ الصَّوْتِ مُخْرَجُهُ أَشَدَّ مِنْ اتِّسَاعِ مُخْرَجِ الْيَاءِ
وَالِوَاوِ لِأَنَّكَ قَدْ تَضَمَّ شَفَتَيْكَ فِي الْوَاوِ وَتَرَفَعَ فِي الْيَاءِ لِسَانُكَ قَبْلَ الْحَنْكِ وَهِيَ
الْأَلْفُ
وهذه الثلاثة أَخْفَى الحُرُوفِ لِاتِّسَاعِ مُخْرَجِهَا وَأَخْفَاهَنْ وَأَوْسَعَهُنَّ مُخْرَجُ الْأَلْفِ
ثُمَّ الْيَاءُ ثُمَّ الْوَاوُ

Among [the letters] are the *layyina* [‘soft, flexible’], which are *wāw* and *yāʾ*, because their articulation is widened for the air of the sound, more than the widening of other [letters] besides them, as you say: *wa ʿayy^{um}* and *al-wāw*, and if you want, you can make the sound occur with lengthening.

[Also] among them is the *hāwī* [‘airy, breathy’], which is a letter whose articulation is widened for the air of the sound even more than the widening of the articulation of *yāʾ* and *wāw*—because you press your lips together for *wāw*, and you raise your tongue in front of the palate for *yāʾ*—and it is *ʿalif*.

¹⁴ The easiest way to visualise this concept is to hold your palm up about an inch in front of your mouth, with your hand perpendicular to the floor. Then pronounce /u/, /a/, and /i/. You will feel the air strike your hand in progressively lower places.

These three are the subtlest of the letters due to their articulations' widening, and the subtlest and widest of them is *ʿalif*, then *yāʿ*, then *wāw*. (Harun 1982, 435–36)

Sībawayh distinguishes the three Arabic *matres lectionis* according to their effects on air during speech. *Wāw* and *yāʿ* are different from *ʿalif* specifically because their articulation requires some obstruction of airflow, either by the lips or the tongue, whereas *ʿalif* is a pure *hāwī* 'airy, breathy' letter. He arranges them in order of 'wideness', which seems to relate to the amount of airflow allowed by each letter, and corresponds to the relative openness of the vowels.

The introduction of *Kitāb al-ʿAyn* also stresses the effect on air when discussing the *matres lectionis*. Convention attributes this text to al-Khalīl ibn Aḥmad al-Farāhīdī (d. 786 or 791), an early scholar of prosody and one of Sībawayh's teachers. In reality, most of the text was compiled after his death, probably by another student, al-Layth ibn al-Muẓaffar (d. c. 803). Despite this, the book's arrangement and parts of the introduction are probably original to al-Khalīl, and in any case the material in the introduction is quite old (Sellheim 2012a; 2012b). In its preliminary discussion on the letters of the alphabet, the text reads:

قال الليث: قال الخليل:

في العربية تسعة وعشرون حرفاً: منها خمسة وعشرون حرفاً صحاحاً لها [أحياز]¹⁵
ومدارج، وأربعة أحرف جوف، وهي الواو والياء والألف اللينة والهمزة وسمّيت

¹⁵ The Makhzūmī edition has أحياناً 'sometimes', though possibly 'occasions' here, but based on the following lines it should probably be أحياز 'spaces'.

جَوْفًا لَأَنهَا تَخْرُجُ مِنَ الْجَوْفِ فَلَا تَقَعُ فِي مَدْرَجَةِ مِنَ مَدَارِجِ اللِّسَانِ، وَلَا مِنْ مَدَارِجِ الْحَلْقِ، وَلَا مِنْ مَدْرَجِ اللَّهَاءِ، إِنَّمَا هِيَ هَاوِيَةٌ فِي الْهَوَاءِ فَلَمْ يَكُنْ لَهَا حِيزٌ تُنْسَبُ إِلَيْهِ إِلَّا الْجَوْفُ. وَكَانَ يَقُولُ كَثِيرًا: الْأَلْفُ اللَّيْنَةُ وَالْوَاوُ وَالْيَاءُ هَوَائِيَّةٌ أَيْ أَنَّهَا فِي الْهَوَاءِ

Al-Layth said: Al-Khalīl said:

‘In Arabic there are twenty-nine letters. Among them are twenty-five sound letters which have spaces and steps, and four letters of the [oral] cavity, which are the soft *wāw*, *yāʾ*, and *ʾalif*, as well as the *hamza*. They are called *jawf* because they exit from the cavity, but do not occur at one of the steps of the tongue, or the steps of the throat, or the step of the palate. Instead, they are airy, in the air, for they do not have a space to attach to besides the cavity. He [al-Khalīl] frequently used to say: the soft *ʾalif*, the *wāw*, and the *yāʾ* are airy, that is, they are in the air.’ (Makhzūmī 1985, 57)

The so-called *ṣiḥāḥ* ‘strong, firm’ letters contrast with the *layyina* ‘soft, flexible’ *ʾalif*, *wāw*, and *yāʾ*. The primary difference between them is that the former letters connect to specific points within the mouth, whereas the latter exist entirely as an effect in the air. Sibawayh cites al-Khalīl in his *Kitāb* more than any other source, but notably does not use al-Khalīl’s phonetic terminology in his chapters on phonology (Versteegh 1993, 16); and yet here *Kitāb al-ʿAyn* agree. These early Arabic grammarians understood vowels differently from consonantal phonemes, associating them not with any particular ‘back’ or ‘front’ locations in the mouth, but rather describing them based on airflow during articulation. The *matres lectionis*, then, are called *layyina* because they alone among the letters incline as streams of air.

These two early sources thus support Eldar's argument that Arabic vowel terminology was created based on airflow, or at least that it was interpreted that way by later scholars. Eldar cites a key passage from Ibn Sīnā's (d. 1037) *Risāla fī 'Asbāb Hudūth al-Hurūf* (Eldar 1983, 46–47; the English translation is my own):

وأما الألف المصوّنة وأختها الفتحة فأظن أن مُخْرِجَهَا مع اطلاق الهواء سلساً غير مزاحم

والواو المصوتة وأختها الضمة فأظن أن مخرجها مع اطلاق الهواء مع ادنى تضيق للمخرج وميل به سلس الى فوق

والياء المصوتة وأختها الكسرة فأظن أن مُخْرِجَهَا من اطلاق الهواء من ادنى تضيق للمخرج وميل به سلس الى أسفل

As for the sounding *ʿalif* and its sister, *fatha*, I believe its articulation is with the loosing of air smoothly, without obstructions.

For the sounding *wāw* and its sister, *ḍamma*, I believe its articulation is with the loosing of air and a little contracting of the articulation point,¹⁶ while inclining smoothly upwards at it.

For the sounding *yāʾ* and its sister, *kasra*, I believe its articulation is from the loosing of air and a little contracting of the articulation point, while inclining smoothly downwards at it.

It seems that Ibn Sīnā reached the same conclusion as Eldar, attributing a unique direction of airflow to each of the Arabic vowels, quite likely based on the names of case vowels (*rafʿ*, *naṣb*,

¹⁶ This point is probably the lips, though it could refer to the whole oral cavity. Likewise for *yāʾ* in the next line.

khafḏ; ‘rising’, ‘standing upright’, ‘lowering’, respectively). This passage fully illustrates the tripartite division of Arabic vowels according to airflow, but Eldar does not discuss the full significance of Ibn Sīnā’s word choice. The root *myl* ‘inclining’ used here is the same as that of the term *’imāla*, which suggests that, at least for Ibn Sīnā, even the allophonic variants of *’alif* could be explained as tilting streams of airflow. This conception of vowel phonology must have been current, at least in some circles of Arabic grammarians, by the early eleventh century, and it also appears in Syriac and Hebrew grammatical texts at roughly the same time.

4.0. TWO EXAMPLES OF SYNCRETISATION IN PHONOLOGICAL SYSTEMS OF THE TENTH AND ELEVENTH CENTURIES

4.1. Elias of Tirhan’s Syriac Grammar

As the Arabic language and its grammatical tradition became dominant across the Middle East, Syriac and Hebrew grammarians adapted elements of the Arabic tripartite division of vowels to fit their older relative systems. Perhaps no author is more emblematic of this development than Elias of Tirhan (d. 1049), who wrote a Syriac grammar specifically for an Arabic-speaking audience in the first half of the eleventh century. In his chapter on vowel pointing, Elias groups the vowels by association with the *matres lectionis*; three for *’alaḗ*: *zqṣṗṗ* /ɔ/, *pṭṣḥṗ* /a/, and *rḥṣṣ* or

sheshlb /e/;¹⁷ two for *waw*: *hḇoṣo* /u/ and *massaqo* or *rwahto* /o/; and one simply called *yod* /i/ (Baethgen 1880, 𐤓, lns. 15–18). Besides the terms which he presents in this chapter, Elias describes vowels a few other ways throughout the text, including: *hḇoṣo* (Baethgen 1880, 𐤕, lns. 16–21), *hḇiṣto* (Baethgen 1880, 𐤓, lns. 1–5) for /u/; and two versions of *waw*, which he calls *metẖbaṣo* ‘contracted’ and *meṯrwaḥo* ‘widened’ (Baethgen 1880, 𐤓, lns. 19–21).

At work here is the old Syriac tradition of ‘wide-and-narrow’ vowels: /u/ requires contraction of the mouth, and is thus *metẖbaṣo*. Its ‘widened’ counterpart is then /o/, which is *meṯrwaḥo*. *Hḇoṣo* ‘contracting’ and *rwahto* ‘widening’ are likewise Elias’s names for /u/ and /o/. All of these terms describe mouth movement and depend on the principle of two-way contrastive vowels laid out by Jacob of Edessa. This idea explains how roots like *hḇs* can refer to an *u*-vowel here, but other authors use it to mean an *i*-vowel:¹⁸ it has meaning only in comparison to other vowels.

There are also indications of Arabic influence here. Most prominent is *massaqo*¹⁹ ‘raised up’, which stands out as a C-stem

¹⁷ Elias of Tirhan apparently worked from a tradition in which an older term for /e/ (*sheshlb*) had become interchangeable with *rḇoṣo* (see Baethgen 1880, 𐤓, ln. 21–𐤓, ln. 5).

¹⁸ Notably, the grammars of Elias of Ṣoba (d. 1046) and Bar Hebraeus (d. 1286), as well as the modern names used for Syriac vowels (see Segal 1953, 152–53).

¹⁹ The root is *slq*.

form in a group of terms otherwise derived from G-stem participles. This uniqueness suggests that it came into use separately from the other terms, probably as a calque of the Arabic *marfūʿ* ‘raised’, but it preserves the relative nature of other Syriac vowel terms. Elias applies it to the ‘higher’ (more-backed) of a pair of vowels—/o/ as opposed to /u/—following the Syriac association of height with backness. There is even evidence that the Arabic phonetic theory based on airflow affected Elias of Tirhan’s understanding of vowels. He was writing for an Arabic-speaking audience, so many of his explanations are meant to resonate with people familiar with Arabic. He explains that there are three *zawʿe* ‘movements’ in Syriac (Baethgen 1880, ܙܘܥܝܐ, lns. 19–21), directly translating the Arabic word for ‘short’ vowels, *ḥarakāt* ‘movements’, which to him are vowels that are written without *matres lectionis*. As such, the Syriac *zawʿe* are *ptōḥō* (/a/), *rbōṣō* (/e/), and *zqōḇō* (/ɔ/), and he considers them each to be *pelgut ʿalāḇ* ‘half-ʿalāḇ’ (Baethgen 1880, ܦܠܓܘܬ ܥܠܐܒ, ln. 21–ܦܠܓܘܬ ܥܠܐܒ, ln. 2). This grouping of terms parallels the Arabic triad of *naṣb* (/a/), *khafḍ* (/i/), and *rafʿ* (/u/), with one central vowel having unobstructed airflow (/a/), and the others being pronounced with relatively ‘upward’ (/ɔ/) and ‘downward’ (/e/) movement. Similarly, it corresponds to the Arabic allophones of ʿalif: *naṣb* (/a/), ʿimāla (/ɛ/ or /æ/), and *tafkḥīm* (/ɔ/). Moreover, while explaining a case where one should read /o/ instead of /u/, Elias says *lʿel ʿapeqn lbart qōḇō* ‘we pronounce the sound upwards’ (Baethgen 1880, ܠܥܠ ܥܦܥܩܢ ܠܒܪܬ ܩܘܒܘܐ, lns. 5–6). While he may be referring to the idea that /o/ is a ‘higher’ (more-back) vowel than /u/, his language mirrors that of Ibn Sīnā (d. 1037), potentially indicating a direction of airflow.

4.2. Saadya Gaon's Hebrew Grammar

Vowel phonology in the Hebrew tradition underwent a similar development in the post-Sībawayh era, with elements of the earlier relative system combining with an airflow theory by the eleventh century. At the centre of this process was Saadya Gaon's (d. 942) 'vowel scale', which he recorded in the fifth chapter of his grammar, *Kutub al-Lughā*. In this chapter, titled *Al-Qawl fī al-Nagham* 'Discourse on Vocal Melody', he lists the Hebrew *ʿirāb* 'vowels' from high to low: *holem* /o/, *qameṣ* /ɔ/, *pataḥ* (or *p/fatḥa*) /a/, *segol* /ɛ/, *ṣere* /e/, *ḥiriq* /i/, and *shureq* /u/ (Skoss 1952, 285).²⁰ This scale is a fully-articulated version of the *milleʿel* and *milleraʿ* comparisons of earlier masoretic homograph lists. It is also precisely what would be expected if a Syriac phonologist undertook the same exercise, ranking the vowels from high to low (perhaps *men lʿal* to *men ltaḥt*?) according to backness. The one exception is /u/, which Saadya seems to remove from the scale in order to support a morphological principle for which he argues later on (see Skoss 1952, 316).

Saadya confirms that his organisation of vowels is based on backness, saying:

ואמא שרח אלבאב אלתאלת אלדי הו מערפה אמאכנהא פי אלפם
ומראתבהא פאנא נקול אדא אכתאר אן יפצל נגמתה פי אול מוצע
ימכנה קטעהא פיה בעד תרקיתהא מן אלחלק פאנה יטהר חניד
אלחלם וקותה סאלכה אמאמה גיר חאידה אלי פוק ולא אלי אספל

²⁰The text is unpointed, so it is difficult to know the exact vowel names. I have used somewhat-modern spellings, but it is not at all clear that this is how Saadya pronounced these names.

ואן שא אן יתגאזז בהא הדא אלמוצע תם יפצלהא טהרת קוה
אלקמץ וכאנת חרכתה אלי אעלי אלחנך כאצה

As for the explanation of the third chapter, which is the knowledge of the places in the mouth, and their levels, we say: if one chose to interrupt their vocal melody at the first point where it could be cut off after its ascension from the throat; then *holem* would emerge, with [the *holem*]'s force proceeding ahead of [that point], not turning upwards or downwards. But if one wanted to take [the vocalic melody] past this point and then interrupt it, the force of *qomeš* would appear, and its movement would be specifically towards the top of the palate. (Skoss 1952, 292, lns. 7–13)

He proceeds in this manner for the rest of the vowels, saying for each one that you *tajāwaz* ‘pass’ the *mawḏi* ‘articulation point’ of the previous vowel. But beyond showing how Saadya arranges vowels according to backness, this passage reveals the degree to which he is familiar with the Arabic grammatical tradition. His explanation of /ɔ/ (i.e., *qomeš*) is the same as Sībawayh’s, and his progression through the *mawāḏi* ‘articulation points’ and *marātib* ‘levels’ of the vowels mimics the language that both Sībawayh and al-Khalīl use in their classifications of consonants (Harun 1982, IV:431–36; Makhzumi 1985, 52–57). Additionally, his explanation of the *quwwa* ‘force’ of each vowel is reminiscent of Arabic descriptions of airflow, focusing on the *ḥaraka* ‘movement’ *ilā fawq* ‘upwards’ or *ilā ’asfal* ‘downwards’. At the same time, Saadya modifies this principle, stating explicitly that /o/ is the *ghayr ḥā’ida* ‘unwavering’ vowel, in contrast to Ibn Sīnā’s understanding that /a/ was the vowel that does not tilt up or down (i.e., *našb*).

Many of Saadya's vowel names seem to be novel, with only the Aramaic *qomeš* and *pataḥ* attested in the Hebrew tradition prior to this text. *Segol* 'a cluster of grapes' is likely derived from the name of the Hebrew accent sign with the same form, but the other four may be Saadya's own tenth-century Hebraisms, all based on mouth movement.²¹ However, these innovations did not immediately catch on, and until at least the eleventh century, grammarians continued referring to /o/, /u/, /e/, and /i/ by either phonetic transcription or the number of dots in each sign (Khan 2000, 24; Steiner 2005, 377–78; Dotan 2007, 633). In fact, rather than accepting Saadya's scale as fully authoritative, his successors modified it to better align it with Arabic phonology.

Sometime in the eleventh century, an anonymous Hebrew grammarian took the Arabic concept of tripartite airflow and merged it with Saadya's vowel scale in an abridged version of *Al-Qawl fī al-Naḡham* that is partially extant (Eldar 1981, 105–18). Titled *Kitāb Naḥw al-ʿIbrānī* 'The Book of Hebrew Inflection', the abridgement maintains a scale arranged by phonetic backness, but also divides the vowels into three groups: *al-raḡ* (/o/ and /u/), *al-khaḡḡ* (/e/ and /i/), and *al-naṣb* (/ɔ/, /a/, and /ε/). Unlike in Saadya's version, the abridger does not use any of the 'modern' vowel names besides *qomeš* (/ɔ/) and *pataḥ* (/a/), albeit in the Arabicised forms *al-qamša* and *al-faṭḥa*. Instead, the author refers to /o/, /u/, /e/, and /i/ by spelling them phonetically, and also calls /i/ and /ε/ "the one dot" and "the three dots," respectively. It places vowels on a scale by ranking their status in the

²¹ Consider *ḥlm* 'closing firmly'; *šry* 'rift, split, tear'; *ḥrq* 'gnashing the teeth'; *šhrq* 'whistling'.

three groups: /o/ is the greater *rafʿ*, /ɔ/ the greater *naṣb*, /a/ the middle *naṣb*, /ɛ/ the lesser *naṣb*, /e/ the lesser *khafḍ*, and /i/ the greater *khafḍ*.

The author also follows the original text in removing /u/ from the scale, although the fragment breaks off before explaining the reason behind this choice. Presumably, /u/ was the ‘lesser *rafʿ*’, as that classification would correspond to the Arabic notion that /u/ emits an upward stream of air, while also following Saadya’s original scale and being phonetically ‘lower’ than /o/. As another example of the same principles: calling /e/ the ‘lesser *khafḍ*’ indicates that one should pronounce the vowel with a downward inclination of air, but not quite as inclined as the ‘greater *khafḍ*’ (/i/). Then the location—fifth from the top of the scale—designates the lesser *khafḍ* as the fifth-most-backed of the vowels. This syncretic Arabic-and-Saadyan scale thus classifies every vowel according to both its effect on airflow and relative amount of backing, combining principles from both the Arabic and Masoretic phonological traditions.

5.0. CONCLUSION

The development of Syriac, Arabic, and Hebrew phonological thought as it relates to vocalisation had significant inter-linguistic overlap during the medieval period. Early Syriac and masoretic sources show that both traditions perceived vowel phonology according to a relative system. This system distinguished homographs by the comparative ‘openness’ of their vocalisation and, at least in the Syriac tradition, it used dots above or below a word to indicate its vowels. Then, over time, terms like *milleʿel*

and *millera*^c developed out of the perceived connection between dot position and vowel quality, and phonetic backness came to be associated with ‘height’.

The Arabic grammatical tradition emerged in this relative context, and although the early uses of *naṣb* ‘standing upright’ and *ʾimāla* ‘bending down’ reflect height-based principles similar to those of the Syrians and Masoretes, later Arabic grammarians interpreted their vowel names as designations of the direction of airflow when articulating vowels. Before the late eighth century, one of these terms—*naṣb* ‘standing up’—had an extended usage that helped distinguish allophones of *ʾalif*, including a back vowel between /a/ and /ɔ/. It is likely that the Syriac name for /ɔ/, *zqṇpṇ* ‘standing up’, is a calque of this term. Other Syriac vowel names may also be Arabic calques, but it is difficult to tell due to the syncretisation of phonological systems that happened in the tenth and eleventh centuries.

Elias of Tirhan’s eleventh-century Syriac grammar exhibits this syncretic phenomenon, as he incorporates some of the Arabic tripartite division of airflow with the old Syriac system of ‘wide-and-narrow’ vowels. Saadya Gaon’s tenth-century Hebrew grammar also demonstrates this phonological blending, as his vowel scale combines the masoretic hierarchy of vowels with the Arabic emphasis on airflow.

This discussion is by no means an exhaustive account of all the connections between medieval Semitic vocalisation traditions, but rather it shows that it is possible to discern such links

by comparing the phonological theories that authors used to describe their own languages. There is much more work to be done in order to connect the dots.

6.0. REFERENCES

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