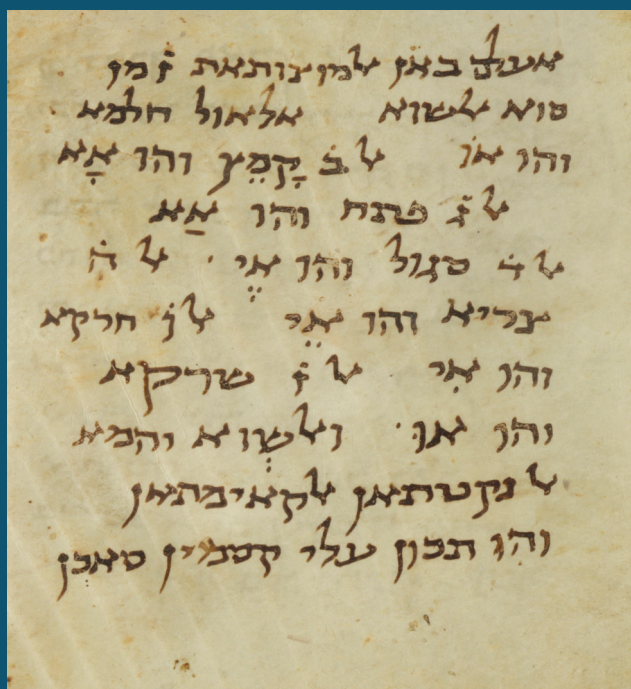# Points of Contact

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

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4. THE DEVELOPMENT OF ABSOLUTE VOWEL NAMING

The vowels have names which are suitable for them, indicating their meanings in the Arabic language, so that they are easy to recognise and clear for the reader. (Anonymous Masorete [c. 10th century]; Allony 1965, 140, lines 28–30)

The idea that particular vowel phonemes might have 'names' developed fairly late in the chronology of Semitic vocalisation traditions, and such names emerged only after the culmination of the early relative vowel systems and the introduction of absolute vowel pointing. Prior to the eighth century, there is little evidence that any Arabic, Syriac, or Hebrew linguists had discrete names like *kasra, zqɔpɔ,* or *segol* for their vowels, but rather they relied on relative terms that compared vowel qualities in different contexts. This situation gave way to absolute vowel naming first in the Arabic tradition, likely because the small number of phonemic Arabic vowels—only three, compared to six or seven in Hebrew and Syriac—made the transition from two-way comparative terms to three absolute names fairly simple. Arabic grammarians implemented these vowel terms in the mid-eighth century at the latest, at a time when Syriac and Hebrew scribes were still transitioning from relative to absolute vowel pointing. With the completion of their absolute dot systems, Syriac and Hebrew linguists then began creating unique vowel names, but neither tradition had a full set of names until the late ninth or tenth century. While some of these new terms evolved from the

earlier relative terminology, some described the vowel dots themselves, and others were adapted from Arabic vowel names.

By examining the chronology of vowel naming in Arabic, Syriac, and Hebrew, it is possible to discern the original meaning of these names, as well as identify further points of contact between the three traditions. For the purposes of this discussion, most vowel names can be classified as one of two main types: graphemic and phonetic. Graphemic names are those which describe the form of a grapheme that represents a vowel in writing (e.g., *mpaggdɔnɔ, segol, zujj*), while phonetic names describe some aspect of the articulatory process required to produce a vowel (e.g., *ptɔḥɔ, ṣiryɔ, ḍamma*).

The conceptual relationship between the Arabic and Syriac phonological traditions is closely intertwined with the development of the Arabic vocalisation system, since the earliest Arabic vowel points—the red-dot system—are a direct import from the Syriac scribal tradition. However, Arabic scribes adopted these dots at the time when the Syriac vocalisation system was still relative and based on comparative diacritical points. Within this context, eighth-century Arabic grammarians developed two separate sets of vowel names: one that described the openness of the mouth during articulation (*fatḥ, ḍamm, kasr*), and another that corresponded to the 'above-and-below' scales of height and backness (*naṣb, rafʿ, khafḍ*). The first set has rough equivalents in both the early Syriac and Masoretic vowel terminology. Meanwhile, the second set evolved from the pre-Sībawayhan tradition of *naṣb* and *ʾimāla* in Qurʾānic recitation, and it later became the source of a few Syriac vowel names (*zqɔpɔ, massaqɔ*) after Syrian scribes

completed their own absolute pointing system. In addition to these six names for their three cardinal vowels, some Arabic scholars refined their naming system by adding additional terms for vowels which appear only in specific morphosyntactic contexts.

Besides the few later Arabic calques, most of the vowel names in the Syriac tradition evolved as extensions of the 'wide-and-narrow' relative comparisons of earlier Syriac grammar. One exception is actually the earliest absolute name in Syriac, *mpaggdɔnɔ* 'bridling', which appears in Jacob of Edessa's work at the end of the seventh century. The earliest attested Syriac sources with semblances of absolute vowel naming systems are Dawid bar Pawlos' (fl. c. 770–800) *scholion* on *bgdkt* letters and Ḥunayn ibn Isḥāq's (d. 873) version of *Ktɔbɔ d-Shmɔhe Dɔmyɔye* (*The Book of Similar Words*), although they still only contain partial sets of terms. Other terms appear in the *mashlmɔnutɔ* material of the codex BL Add. 12138, which was completed in 899 but certainly copies from earlier sources. Additional names occur in the Syriac lexica of ʿĪsā ibn ʿAlī (d. c. 900) and Ḥasan bar Bahlul (fl. 942–968), both of whom recorded and transmitted the work of scholars like Ḥunayn, who participated in the Syriac and Arabic translation movements. However, they too lacked names for every discrete Syriac vowel, and it was not until the eleventh-century grammars of Elias of Nisibis (d. 1046) and Elias of Ṭirhan (d. 1049) that complete sets of absolute Syriac vowel names appeared. Even then, the names of the two Eliases differ from one another.

Like in Syriac, the first absolute names in the Hebrew tradition
were based on earlier relative phonology, with *pɔtaḥ* 'opening'
and *qɔmeṣ* 'closing' solidifying as the absolute names for /a/ and
/ɔ/. Then, during the ninth and tenth centuries, four different
conventions emerged that Hebrew linguists used to supplement
pɔtaḥ and *qɔmeṣ*: expansion of the earlier relative terminology,
descriptions of graphemes that represented vowels, descriptions
of articulatory processes, and terminology borrowed from the Ar-
abic grammatical tradition. These conventions overlapped and
mixed with each other, and all four are still present in the modern
names for the Hebrew vowels. Hebrew scholars also took the
unique step of organising their vowels into phonetic groups lo-
cated along the earlier *milleʿel-milleraʿ* scale, a practice which
spans Masoretic sources in both Hebrew and Judaeo-Arabic and
features in Abū al-Faraj's (d. c. 1050) *Hidāya al-Qārī* (*The Guide
for the Reader*).

1.0. Vowel Names in the Arabic Tradition

The Syriac scribal and grammatical traditions influenced Arabic
linguistics from the earliest period of Qurʾānic vocalisation in the
late seventh and early eighth centuries. While this influence di-
rectly affected the introduction of diacritic and vowel points to
the Arabic script, it did not introduce absolute vowel names into
Arabic linguistic vocabulary. Instead, Arabic grammarians devel-
oped absolute vowel names at a time when Syriac grammarians
were still using a relative vocalisation system, and most absolute
Syriac vowel names are unattested until at least half a century

after they first appear in the Arabic tradition. That said, the Arabic set of *fatḥa* (/a/), *ḍamma* (/u/), and *kasra* (/i/) (henceforth: 'non-*ʾiʿrābī* set') is conceptually similar to earlier Syriac descriptions of "wide-and-narrow" vowels. These Arabic names are attested in the earliest sources, and likely saw use in Qurʾānic pedagogy before the first Arabic grammarians put pen to parchment. Additionally, the meanings of the set of *naṣb* (/a/), *rafʿ* (/u/), and *khafḍ* (/i/) (henceforth: 'ʾiʿrābī set') are based on the same principle of phonetic 'height' that determined the position of the diacritic dots and the two-way comparisons of *ʾimāla* and *naṣb*. These terms were names both for vowel phonemes and for the grammatical cases that those phonemes represent from as early as the first half of the eighth century.

In addition to terms for the cardinal vowels, some Arabic grammarians refined their naming system by introducing terminology for vowels produced in specific morphosyntactic contexts. These refinements include allophones of the cardinal vowels as well as different names related to syllable position and length. Our most concise source for this terminology is a list in the encyclopaedia *Mafātīḥ al-ʿUlūm* (*The Keys to the Sciences*) by Muḥammad ibn Aḥmad al-Khwārizmī (d. 997). Many of the terms in this list can be linked to passages in *Kitāb al-ʿAyn* and *Kitāb Sībawayh,* but later sources like Ibn Jinnī's (d. 1002) *Sirr Ṣināʿa al-Iʿrāb* further clarify their usage, and it seems that al-Khwārizmī's vowel 'system' is somewhat idiosyncratic to him.

1.1. Names for Cardinal Vowels

The modern names for the three cardinal Arabic vowels are the non-ʾiʿrābī set of *fatḥ* 'opening', *kasr* 'breaking', and *ḍamm* 'bringing/pressing together', and all three are attested from the mid-eighth century onwards (Versteegh 1993, 18, 125–30; Talmon 1997, 194–97).[1] They are phonetic names, each describing a physical process required to articulate a vowel. *Fatḥ* is the 'opening' of the mouth when saying /a/ while *ḍamm* is the 'pressing-together' of the lips when saying /u/. The phonetic meaning of *kasr* is less certain, and depends on which portion of the vocal tract it originally meant to describe. For example, in his version of the story of Abū al-Aswad (see above, chapter 3, §2.1), al-Dānī (d. 1053) connects the vowels to the movement of the 'lips' (*shafatān*) (al-Dānī 1960, 2b–3a). By contrast, an earlier record of the story in Abū al-Ṭayyib's (d. 962) *Marātib al-Naḥwiyyīn* (*The Ranks of Grammarians*) instructs that the vowels depend on the movement of the 'mouth' (*fam*). If *kasra* applies to the whole mouth, then it may describe the 'breaking' of the vocal tract into two sections by the raising of the tongue towards the palate (al-Nassir 1993, 33; Versteegh 2011).[2] Alternatively, if *kasr* is derived from the movement of the lips, then it presents a logical contrast as an antonym of *ḍamm*: 'breaking [apart]' as opposed to 'pressing together'.

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[1] They usually appear as *fatḥa, kasra,* and *ḍamma* when indicating the vocalisation sign rather than describing the mode of articulation.

[2] Versteegh's translation of *wa-ʾidha kasartu famī* as 'when [you see me] folding my mouth', while lexically possible, does not seem plausible to me.

These names are based on an easily observable physical phenomenon and double as instructions for how a speaker should move their lips to properly articulate a vowel. They also have notable parallels in Syriac and Hebrew. *Fatḥ* (/a/) reflects the same thinking as Jacob of Eddessa's *pte* 'wide' descriptor for relatively-open vowels, while *ḍamm* (/u/) corresponds to his idea of *qaṭṭin* 'narrow' for relatively-closed vowels. Moreover, *fatḥ* is cognate with the *ptiḥtɔ* descriptor for /a/ and the open pronunciations of the *matres lectionis* letters *waw* and *yod* in Dawid bar Pawlos' *scholion* on *bgdkt* letters (see above, chapter 3, §1.1), as well as the common Syriac vowel name *ptɔḥɔ*. The same can be said for *pɔtaḥ* 'opening', the early Masoretic term for relatively-open vowels and later the name for /a/ alone. *Ḍamm* corresponds lexically to several Syriac vowel names, including *ḥbɔṣɔ* (/i/, /u/), *zribɔ* (/e/), *rbɔṣɔ* (/e/), and *ʿṣɔṣɔ* (/u/), all of which indicate some idea of 'compressing' or 'constraining' in the articulation of relatively closed vowels. The same applies to the Masoretic *qɔmeṣ* (/ɔ/), which means 'closing' in reference to the mouth and indicated relatively-closed vowels before stabilising as the Tiberian name for /ɔ/. Then *kasr* may be the source of *ṣere* 'crack, cracking', the Tiberian name for /e/, but it does not seem to have a Syriac parallel. Versteegh has argued that it is related to *ḥbɔṣɔ* 'squeezing, pressing together' (Versteegh 1993, 30; see also Versteegh 2011), but this is not a common definition for *kasr*, and probably not a calque (see Kazimirski 1860, 895–97; Lane 1863, 2610–12; Wehr 1993, 967–68). All of these connections rely on the same principles of opening and closing the mouth that were current in the relative vocalisation systems of the seventh and

eighth centuries, and there is no clear way to determine which ones are calques and which are independent derivations based on similar phonological thinking.[3]

As for the *ʾiʿrābī* set, they are best known as the names for the noun cases and verbal moods in Classical Arabic. *Naṣb* 'standing upright' is the name for the accusative case, *rafʿ* 'rising' is the nominative case, and *khafḍ* 'lowering' is well-known as the genitive case in the Kufan grammatical school. Additionally, *jarr* 'dragging, drawing, pulling' is the name for the genitive case in the Basran school (Kinberg 1987, 15; al-Zajjājī 1959, 93; Versteegh 1993, 18). However, as we have seen, prior to Sībawayh's *Kitāb,* these words served interchangeably as both case names and the names for the vowels that most often marked those cases (Talmon 2000, 250). Versteegh identifies a Qurʾānic *tafsīr* by Muḥammad al-Sāʾib ibn al-Kalbī (d. 763) as one of the earliest sources that employs the *ʾiʿrābī* set as vowel names. In it, he uses *fatḥ* and *naṣb* for /a/; *ḍamm* and *rafʿ* for /u/; and *kasr, khafḍ,* and *jarr* for/i/; even applying the *ʾiʿrābī* names to internal vowels with no grammatical import (Versteegh 1993, 125–30). The lexical sections of *Kitāb al-ʿAyn* contain further examples of this interchangeability, suggesting it was common in the 'Old Iraqi' school of Arabic grammar some decades before al-Khalīl and Sībawayh (Talmon 1996, 288; 1997, 194–97; 2000; 2003, 159, 235–40). Due to this lack of distinction between these two sets of terms, Versteegh (1993, 126) concludes that "the later terms for the case endings were once part of a system to indicate vowels."

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[3] Though note Merx (1889, 154), among others, who holds that the Syriac names are the sources of the Arabic names.

The prevailing notion as to the origin of the *ʾiʿrābī* set is that they are calques from Syriac vowel names, possibly also affected by the influence of Greek grammar (Revell 1975, 181; Versteegh 1993, 26–32, 127–29; Talmon 1996, 290–91; 2000, 248–50; Versteegh 2011). Specifically, the thinking goes that *naṣb* and *khafḍ* are calques of the Syriac vowel names *zqɔpɔ* 'standing upright' and *rbɔṣɔ* 'compressing' (although Versteegh and Revell interpret it as 'lowering'). Versteegh and Revell both propose that early Arabic linguists adopted these Syriac names at the same time that they adapted the Syriac diacritical dots to Arabic (Revell 1975, 181 n. 2; Versteegh 1993, 31–32). Talmon generally concurs, but also emphasises that the reconstruction of this borrowing relies on the list of vowel names that Bar Hebraeus (d. 1286) attributes to Jacob of Edessa (d. 708) (see Merx 1889, 50), even though most Syriac vowel names are not actually attested before Ḥunayn ibn Isḥāq's (d. 873) version of the *Ktɔbɔ d-Shmɔhe Dɔmyɔye* (*The Book of Similar Words*) (Talmon 2008, 165; see Hoffmann 1880, 2–49). Meanwhile, the *ʾiʿrābī* names are attested from no later than approximately 750, and *naṣb* may have described relatively-backed allophones of *ʾalif* even earlier.

I previously argued that since *zqɔpɔ* was unattested prior to Ḥunayn Ibn Isḥāq, and since *rbɔṣɔ*, *ḥbɔṣɔ*, and *ʿṣɔṣɔ* were unattested prior to the eleventh-century Syriac grammars, none of them could be sources of the Arabic vowel names (Posegay 2020, 202–6). However, several of the Syriac terms are actually attested earlier, some even before Ḥunayn ibn Isḥāq's work. Most notable for the discussion of Arabic vowel names is the occurrence of *zqiptɔ* 'stood upright', *hbiṣtɔ* 'pressed', and *ʿṣiṣtɔ* 'constrained' to

describe vowel qualities in the *scholion* on *bgdkt* letters by Dawid bar Pawlos (fl. c. 770–800).[4] Dawid was a contemporary of Sībawayh, about 30 years younger than al-Khalīl, and his career pushes *zqiptɔ* much closer to the presumed introduction of *naṣb* as a vowel name in first half of the eighth century. Despite this, the evidence from *Kitāb al-ʿAyn* and other sources of vowel naming in the Old Iraqi school still suggest that the *ʾiʿrābī* names predate Dawid's *zqiptɔ* by several decades at least, and perhaps as much as 75 years. The fact remains that chronologically, the closest descriptions of Syriac vowels to the introduction of the Arabic dots are those in Jacob of Edessa's writings, and even at the end of the seventh century, he describes the Syriac relative vocalisation system without any hint of the later absolute names. Unless additional early Syriac sources emerge, it remains more likely that the Arabic *ʾiʿrābī* names are the sources of later Syriac vowel names, rather than the converse. This chronology correlates with the adoption of the red-dot absolute vocalisation system in Arabic, which preceded the final developments of absolute pointing in both Syriac and Hebrew.

Nevertheless, as Revell and Versteegh note, the principles of phonetic height that determined the placement of the Arabic diacritic and vowel points do seem to originate with the high and low homograph comparisons of seventh-century Syriac. It was those same principles that likely led to the first binary usage of *naṣb* 'standing upright' and *ʾimāla* 'bending down' to designate relatively backed or fronted allophones of /a/ and /ā/ in Arabic

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[4] MS Mardin, ZFRN 192 f. 199r, lines 11–18 and f. 200r, line 5; MS Jerusalem, SMMJ f. 166r, line 10. See Farina (2021).

(see above, chapter 3, §2.2). These two terms would have been necessary to teach the recitation of variant vowel qualities that the Arabic script had no way of recording. As the red-dot system spread, *naṣb* became the absolute name for /a/, while the term *tafkhīm* 'thickening' became the standard word for backed allophones, like /o/ in *ṣalāt* 'prayer' and /ɑ/ after *mustaʿliya* letters.[5]

ʾ*Imāla* remained in use to indicate fronted allophones like /e/, but it was also associated with the concept of *khafḍ*. This likely resulted in part from grammarians perceiving letters produced in front of the velum as *munkhafiḍa* 'lowered' in contrast to the elevated *mustaʿliya* letters. As we have seen, Ibn Jinnī attests to this contrast in his division of the alphabet (Kinberg 1987, 13; Ibn Jinnī 1993, 4, 62; al-Nassir 1993, 51). When the grammarian Abū al-Qāsim al-Zajjājī (d. 948/949) explains the *khafḍ* case in his *al-Īḍāḥ fī ʿIllal al-Naḥw* (*The Clarification of the Reasons of Grammar*), he says: "And regarding the one called *khafḍ* among the Kufans, they explained it in the same manner as the explanation of *rafʿ* and *naṣb*, for they said [it was] due to the lowering of the lower jaw during its articulation, and its bending toward one of two directions (ومن سماه منهم من الكوفيين خفضاً، فإنهم فسروه نحو تفسير الرفع والنصب فقالوا لانخفاض الحنك الأسفل عند النطق به، وميله إلى إحدى الجهتين)" (al-Zajjājī 1959, 93; see Kinberg 1987, 15). Al-Zajjājī

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5 *Fukhkhāma* and the phrase ʾ*alif mufakhkhama* appear in the lexical material in *Kitāb al-ʿAyn*, likely stretching back to the period of the Old Iraqi school. This 'thickening' of ʾ*alif* is presented as contrasting ʾ*imāla* and resembling *wāw* (Makhzumi 1985, III:317; IV:103, 281; Talmon 1997, 136, 141). Note that Sībawayh does not use *tafkhīm* for this purpose, and only applies it to the /ō/ allophone of ʾ*alif* in *ṣalāt*, *zakāt*, and *ḥayāt* (Sībawayh 1986, IV:432).

uses the word *mayl* 'bending, inclination' to explain the directionality of *khafḍ*'s articulation, taking the same root as *ʾimāla* to indicate the fronted articulation point and low tongue position of the vowel /i/. There is also one passage in the lexical sections of *Kitāb al-ʿAyn* that presents *munkhafiḍ* 'lowering, lowered' and *māʾil* 'bending, inclining' as synonyms when describing the position of a relaxed shoulder, both as opposed to a raised shoulder, which is called *muntaṣib* 'standing upright' (Makhzumi 1985, IV:79; Talmon 1997, 139).

This continued association of the front of the mouth with a comparatively 'low' position led to the addition of *khafḍ* 'lowering' as a name for /i/. Along with *naṣb* for /a/, the only remaining cardinal vowel was /u/, which was called *rafʿ* 'rising'. This 'rising' reflects the comparatively-backed position of the velar vowel /u/, which was 'raised up' with the tongue retracted near the position of the *mustaʿliya* letters. The lexical material in *al-ʿAyn* supports this interpretation while defining *tafkhīm*, where it states: "The *tafkhīm* of speech is magnifying it; *rafʿ* in speech is *tafkhīm*; and *ʾalif mufakhkham* resembles *wāw* (. وتفخيم الكلام تعظيمه) (والرفع في الكلام تفخيم. وألف مفخم يضارع الواو" (Makhzumi 1985, IV:281; Talmon 1997, 141). Furthermore, the entry on *naṣb* says: "*Naṣb* is your *rafʿ* [raising] of something, you setting it upright, standing straight up (والنَصْب—رَفعُك شيئاً تَنصِبُه قائماً منتصباً)" (Makhzumi 1985, VII:136). Al-Azharī's (d. 980) later addition to this section is similar, as he says: "The *manṣūb* word, its sound is *yurfaʿ* [raised up] toward the upper palate (الكلمة المنصوبة يُرفَع صوتُها الى الغار الأعلى)" (Makhzumi 1985, VII:136). *Al-ʿAyn* further suggests that *rafʿ* was the natural antonym for *khafḍ*, as the *rafʿ*

entry reads: "*Rafᶜ* is the opposite of *khafḍ* (الرفع نقيض الخفض)" (Ma-khzumi 1985, II:125; Talmon 1997, 198). The entry for *khafḍ* then states: "*Khafḍ* is the opposite of *rafᶜ* (الخفض نقيض الرفع)" (Ma-khzumi 1985, IV:178). It seems that when Arabic phonologists implemented the absolute *ʾiᶜrābī* vowel vowels, they added *khafḍ* and *rafᶜ* as a natural binary pair to the pre-existing pair of *naṣb* and *ʾimāla*.

Besides this phonetic meaning, *rafᶜ* was also linked to *naṣb* in the grammatical teaching of the Old Iraqi school, where it formed an early distinction between perfect and imperfect verbs in the *ʾiᶜrāb* system. Again in the *naṣb* entry of *Kitāb al-ᶜAyn*, the text reads: "*Naṣb* is opposed to *rafᶜ* in *ʾiᶜrāb* (النَصْب ضد الرفع في الإعراب)" (Makhzumi 1985, VII:135), apparently referring to an Old Iraqi method of distinguishing verbal aspects. Talmon notes that despite Sībawayh's instructions to separate the *ʾiᶜrābī* and non-*ʾiᶜrābī* vowel sets, he also applies the term *naṣb* to the non-inflectional /a/ ending of a few perfect verbs, likely in contrast to imperfect verbs which end in /u/. He thus argues that in this case, Sībawayh "seems to follow an early theorem that considers the *a* vs. *u* contrast in the perfect vs. imperfect verbs a significant *ʾiᶜrābī* feature" (Talmon 2003, 238).

In sum, the *ʾiᶜrābī* set of vowel names reflects the same prin-ciple of phonetic height that informed the placement of the Syr-iac and Arabic diacritic dots, the Tiberian vocalisation points, and the red-dot vowel system. *Naṣb* 'standing upright' meaning /a/ is a remnant of an earlier system for describing allophones of *ʾalif*, representing relatively 'high' backed vowel qualities in com-parison to the relatively fronted 'low' qualities of *ʾimāla* 'bending

down'. The perception among Arabic grammarians of the front of
the mouth as low led to the classification of *munkhafiḍ* conso-
nants and the use of *khafḍ* 'lowering' as a name for the vowel /i/.
They also introduced *raf*ᶜ 'rising', the logical opposite of *khafḍ*, as
a name for /u/, indicating its raised articulation at the top of the
mouth near the place of the *mustaᶜliya* letters.

Lastly, rather than *khafḍ*, the Basran grammatical school
referred to both /i/ and the genitive case as *jarr* 'dragging, draw-
ing, pulling'. This term is attested in the same early sources as
the other three ʾiᶜrābī names (e.g., Ibn al-Kalbī's *tafsīr* and *Kitāb
al-ᶜAyn*'s lexicon), and it can be interpreted as a phonetic name
in contrast to *ḍamm* 'pressing together', describing the action of
'pulling' or 'drawing' back the lips to pronounce /i/. However, it
may be more likely that the original meaning referred to the ex-
tension ('drawing out') of a word by adding /i/ to facilitate the
pronunciation of an unvocalised consonant. Talmon argues that
this usage of *jarr* is derived from the West Syriac cognate and
accent name *gɔrorɔ* (Talmon 1996, 290–91; 2000, 250; 2008,
174), which also means 'drawing' or 'pulling,' and informs a
reader to "draw out or prolong in recitation, and hence to stress,
the syllable to which it is attached" (Segal 1953, 123). For this
explanation, he cites al-Khwārizmī's (d. 997) example of *jarr* in
Mafātīḥ al-ᶜUlūm (*The Keys to the Sciences*), which refers to the /i/

vowel added to the end of a jussive verb to connect it to a subsequent *ʾalif waṣl* (al-Khwārizmī 1968, 45, lines 7–9; Fischer 1985, 99).[6]

To this evidence we may add a statement from al-Zajjājī, who writes: "As for *jarr*, it is only called that because the meaning of *jarr* is *iḍāfa* [addition]; and that is, the *jārra* letters pull what precedes them, connecting it to what follows them, as you say 'I passed *bi-zaydⁱⁿ*,' for the *bāʾ* has connected your passing to Zayd

(وأما الجر، فإنما سمي بذلك لان معنى الجر الإضافة؛ وذلك ان الحروف الجارة تجر ما قبلها فتوصله إلى ما بعدها كقولك مررت بزيد، فالباء أوصلت مرورك إلى زيد)" (al-Zajjājī 1959, 93). For al-Zajjājī here, *jarr* is the /i/ added to the preposition *b-* 'by, with' to connect it to the noun Zayd. In that sense, Talmon's interpretation of the term's meaning seems correct. Moreover, unlike the other Syriac terms that have been proposed as sources for the *ʾiʿrābī* names, *gɔrorɔ* is actually attested prior to the time of the Old Iraqi school in the accent list attributed to Thomas the Deacon (fl. c. 600) (Martin 1869, ܚ, line 17; see also, Phillips 1869, 77; Segal 1953, 120).

In conclusion, both the *ʾiʿrābī* (*naṣb, khafḍ, rafʿ, jarr*) and non-*ʾiʿrābī* (*fatḥ, kasr, ḍamm*) sets of vowel names are attested in the earliest eighth-century Arabic grammatical sources. In this early period, the two sets were used interchangeably, representing both final 'inflectional' vowels and internal vowel phonemes. The non-*ʾiʿrābī* set shares its meanings with vowel names in both

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[6] Al-Khwārizmī attributes his list of vowel terms to al-Khalīl, and Talmon treats it as genuinely Khalīlian, but this is not certain (Talmon 2003, 263–65). The vowel list in *Mafātīḥ al-ʿUlūm* is discussed below.

Syriac and Hebrew, but it is not clear whether one tradition bor-
rowed from the others or vice versa. It is equally possible that
'open-and-closed' phonetic naming was a kind of areal feature in
early Islamicate Semitic phonology, and Arabic linguists derived
their vowel names without directly calquing Syriac terminology.
Meanwhile, the ʾiʿrābī set (except *jarr*) emerged out of the wide-
spread perception of 'high-and-low' phonology that also perme-
ated the Syriac and Hebrew relative vocalisation systems. These
explanations suffice for the names of the three cardinal vowels in
Arabic, but Arabic grammarians also refined their phonological
vocabulary by creating terms for vocalic allophones and vowels
in specific morphosyntactic positions.

1.2. Refining the Arabic System: Al-Khwārizmī and the Keys to the Sciences

Arabic grammarians and Qurʾān reciters developed numerous
technical terms for addressing the allophonic realisations of vow-
els in certain contexts, and we have already seen a bit of this
terminology in the analyses of ʾimāla and *tafkhīm* (see above,
chapter 3, §2.2). This section will discuss additional pertinent
vowel terminology through the lens of the chapters on grammar
in Muḥammad ibn Aḥmad al-Khwārizmī's (d. 997) encyclopae-
dia, *Mafātīḥ al-ʿUlūm* (*The Keys to the Sciences*) (see Bosworth
1963; Fischer 1985). Al-Khwārizmī claims to transmit two sepa-
rate non-standard traditions of ʾiʿrāb, one from al-Khalīl ibn
Aḥmad (d. 786/791) and one from "the school of the philosophy
of the Greeks" (al-Khwārizmī 1968, 44–46). Both mention multi-
ple vowel names besides those covered above. The division of the

text suggests that al-Khwārizmī perceived the *ʾiʿrāb* systems of al-Khalīl and the Greek philosophers as different from that of the majority of Arabic grammarians, who essentially followed the system laid out by Sībawayh (al-Khwārizmī 1968, 42–44).

We have already addressed the most likely source for al-Khwārizmī's Greek school—namely, the Arabic grammar of Ḥunayn ibn Isḥāq (see above, chapter 2, §3.3)—but his attribution of information to al-Khalīl is more problematic. First, while al-Khwārizmī was an accomplished encyclopaedist, he was not a grammarian, and several inconsistencies in the text of these chapters suggest he might have made some mistakes (e.g., Fischer 1985, 96, 99). His goal with *Mafātīḥ al-ʿUlūm* was to provide a useful reference book for tenth-century Islamicate scribes, and compiling a wide range of obscure (and perhaps dubious) linguistic terminology may have been preferable to only recording a few terms with well-known meanings. Second, as Wolfdietrich Fischer notes, in more than 550 quotations from the *Kitāb*, Sībawayh never cites al-Khalīl using al-Khwārizmī's terminology (Fischer 1985, 97; see Reuschel 1959). Sībawayh does not quote his teacher in any of his own chapters on phonetics (Troupeau 1958; 1976, 16–17; Versteegh 1993, 16), but many of al-Khwārizmī's 'Khalīlian' terms are not phonetic in nature, so the absence is still striking. Talmon does locate most of the Khalīlian terms in linguistic contexts in the lexical portions of *Kitāb al-ʿAyn*, but besides those names which are shared with the typical *ʾiʿrābī* system, their meanings do not closely match al-Khwārizmī's (Talmon 1997, 264).

Fischer (1985, 98) concludes that "we may regard them as al-Khalīl's true technical terms, until we get proof to the contrary," despite the fact that they suggest al-Khalīl's approach to grammar and ʾiʿrāb differed considerably from Sībawayh's (Fischer 1985, 98–101).[7] We know this is not the case (Versteegh 1993, 17; Talmon 2003, 279–80). Talmon is slightly more cautious, but still concludes that

> the list is a unique attempt, probably by al-Khalīl himself, to create a most accurate terminology of the vowel system. This set was probably neglected by the inventor himself, but was recorded by posterity as a curious attempt. It does not undermine the attribution to al-Khalīl of the vowel terminology and related terms, although it does not support it in any significant manner (Talmon 1997, 265).

The present study accepts that many of al-Khwārizmī's 'Khalīlian' terms are undoubtedly based on linguistic terminology from the eighth century, but it remains sceptical that *Mafātīḥ al-ʿUlūm* faithfully transmits their original meanings or that al-Khalīl himself actually employed them as a vowel-naming 'system'. The following discussion refers to them collectively as 'pseudo-Khalīlian'.

Al-Khwārizmī lists 21 items among the pseudo-Khalīllian terms in his encyclopaedia, 18 of which are names for vowels. Seven of these are the ʾiʿrābī and non-ʾiʿrābī names (see above, present chapter, §1.1), including *jarr*. He describes each of these

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[7] Specifically, Fischer argues that these terms suggest al-Khalīl did not recognise Sībawayh's fundamental principle of ʿamal 'governance' in analysing ʾiʿrāb. On this concept, see Rybalkin (2011).

as having essentially the same function as they do in most grammatical texts, albeit with contextual restrictions (e.g., *raf* only applies to words with *tanwīn*) (Fischer 1985, 98–100; Talmon 1997, 264).[8] The other 11 have no parallels in the names for cardinal vowels. They are, in the order that they appear: *tawjīh*, *ḥashw*, *najr*, *ʾishmām*, *qaʿr*, *tafkhīm*, *ʾirsāl*, *taysīr*, *ʾiḏjāʿ*, *ʾimāla*, and *nabra* (al-Khwārizmī 1968, 44–46).

Al-Khwārizmī writes that *tawjīh* 'guidance, direction' is "what occurs at the beginnings of words, for example, the *ʿayn* in *ʿumar* and the *qāf* in *qutam* (ما وقع في صدور الكَلِم نحو عين عُمَر وقاف قُتَم)" (al-Khwārizmī 1968, 44, lines 6–7). That is, *tawjīh* is /u/ that occurs in the first syllable of a word (Fischer 1985, 100). This term does not appear in *Kitāb al-ʿAyn*, but in the context of this list it belongs with *ḥashw* 'stuffing', a name for /u/ in an internal syllable of a noun (e.g., *rajul*[un]), and *najr* 'natural form, condition' (Kazimirski 1860, 1202; Lane 1863, 2830), a name for /u/ in the final syllable of a noun (e.g., *al-jabalu*) (al-Khwārizmī 1968, 44, lines 7–8; see Versteegh 1993, 18).[9] Each of these three represents the same vowel in different syllabic positions, a distinction which has little importance in grammar (where *ḍamm* can cover all three), but which would have been useful in analysing poetic metre. Talmon notes that *ḥashw* can refer to any internal letter in *Kitāb al-ʿAyn* (Talmon 1997, 264), but it is also the prosodic term

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[8] Three further terms are names for 'silence' or 'lack of vowel' (*jazm*, *taskīn*, *tawqīf*) (al-Khwārizmī 1968, 45, lines 9–11). They are related to the *ʾiʿrābī* and non-*ʾiʿrābī* sets of vowel names, but are not analysed here.

[9] Al-Khwārizmī specifies that *najr* does not apply to a word with *tanwīn*.

for a verse's internal feet, excepting the last foot of each hemistich (Abbas 2002, 48).[10] *Tawjīh* is also a technical term in poetry, where it indicates a verse that has two different meanings (Abbas 2002, 300). *Najr* is not a prosodic term, and in general it relates to carpentry, but its meaning of a 'natural form' may indicate the default function of /u/ as the marker of nouns in the nominative case. While it is not clear why al-Khwārizmī connects /u/ to these three terms in particular, it does seem that the tradition which he transmits is somehow derived from prosodic vocabulary. Given al-Khalīl's outsized influence on Arabic prosody (Frolov 2011; Sellheim 2012), al-Khwārizmī's attribution of these terms to him is unsurprising.

The next pseudo-Khalīlian term is ʾishmām 'giving a scent', which al-Khwārizmī says is "what occurs at the beginning of deficient words, for example, the *qāf* of *qīla* when it is given a hint of ḍamma (ما وقع في صدور الكَلِم المنقوصة نحو قاف قيل اذا أُشِمَّ ضَمَّةً)" (al-Khwārizmī 1968, 44, lines 10–11). This explanation describes the pronunciation of the long /ī/ in *qīla* 'it was said' as slightly rounded and backed (i.e., /ɨ/), approximating /u/ (i.e., ḍamma) (Alfozan 1989, 35; see also, 16, n. 49, no. 2). ʾIshmām appears in the lexical portions of *Kitāb al-ʿAyn*, where it indicates "pronunciation of a shade of a vowel," mainly /i/ with shades of /u/ (Makhzumi 1985, VI:224; VIII:13, 92; Talmon 1997, 141, 264). Sībawayh also defines it in his discussion of the endings of words in pausal form (see Hoberman 2011):

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[10] Cf al-Dānī's (1960, 39, 53–54) usage of ḥashw when explaining Qurʾānic pointing.

وأما الإشمام فليس إليه سبيل، وإنما كان [ذا] في الرفع لأنَّ الضمة من الواو،
فأنت تقدرِ أن تضع لسانك في أيِّ موضع من الحروف شئتَ ثمّ تَضمّ
شَفَتَيك، لأنّ ضمَّك شفتيك كتحريكك بعض جسدك، وإشمامك في الرفع
للرُّؤْية وليس بصوتٍ للأُذُن.

As for *ʾishmām*, it is not towards a particular way, but ra-
ther it is in *rafʿ* because *ḍamma* is from *wāw*, so you are
able to put your tongue in whatever position of the letters
that you want, and then bring together your lips, since
your bringing together of your lips is like your imparting
movement to part of your body. Your *ʾishmām* in *rafʿ* is vis-
ual, not with any sound for the ears. (Sībawayh 1986,
IV:171)

Sībawayh's explanation emphasises that *ʾishmām* is a visual phe-
nomenon that is only possible because *ḍamma* is articulated with
the same lip movement as *wāw*. As such, a speaker can use their
tongue to pronounce another letter at the end of a word in pause
while also pressing their lips together in the shape of *ḍamma*, but
not fully pronouncing /u/. The letter is thus given a 'scent' or
'hint' of *ḍamma*, while not actually being vocalised as such (Al-
fozan 1989, 16, n. 49, no. 4). This phenomenon contrasts al-
Khwārizmī's explanation, which refers to an internal vowel and
indicates an aural change.

Ibn Jinnī (d. 1002) also uses *ʾishmām* to describe blended
allophones, similar to al-Khwārizmī's mixed vowel. He connects
these allophones to the sense of smell, writing:

وأما الضمة المشوبة بالكسرة فنحو قولك في الإمالة: مررت بمذعِور، وهذا
ابن بِور، نَحوتَ العين والباء نحو كسرة الراء، فأشممتها شيئاً من الكسرة.
وكما أن هذه الحركة قبل الواو ليست ضمة محضة، ولا كسرة مرسلة،
فكذلك الواو أيضاً بعدها هي مشوبة بروائح الياء، وهذا مذهب سيبويه، وهو
الصواب

> As for the *ḍamma* mixed with *kasra*, for example in *ʾimāla*
> as you say '*marrartu bi-madhⁱūrⁱⁿ*' and '*hādhā ibn būrⁱⁿ*', you
> make the form of the *ḍamma* on the *ʿayn* and the *bāʾ* re-
> semble the *kasra* of the *rāʾ*, so you give it the scent of a bit
> of the *kasra*. Just as this vowel before this *wāw* is not a
> pure *ḍamma*, neither is it a slackened *kasra*, and likewise
> the *wāw* after it is mixed with the odours of *yāʾ*. This is the
> school of Sībawayh, and it is correct. (Ibn Jinnī 1993, 53)

Ibn Jinnī interprets the same example of the *ʾimāla* of /u/ (i.e.,
madhⁱūrⁱⁿ 'frightened') that Sībawayh used in the *Kitāb* (see above,
chapter 3, §2.2), and says that the blending of /u/ occurs when
'you give it the scent' (*ʾashmamtahā*) of /i/. The result is that the
long vowel of the *wāw* takes on *rawāʾiḥ* 'odours' of *yāʾ*, and its
quality is realised as /u/ with a hint of /i/ (i.e., a fronted rounded
vowel). Ibn Jinnī uses the same olfactory language to describe
other vowel blends (e.g., /a/ mixed with /u/ or /i/) (Ibn Jinnī
1993, 53–54), as well as the changing of a particular consonant
to approximate another consonant (e.g., *ṣād* like *zāy*) (Ibn Jinnī
1993, 51; see Alfozan 1989, 16, n. 49, no. 1).

Al-Khwārizmī also gives a second description of *ʾishmām*,
this time from the "school of the philosophers of the Greeks."[11]
According to them: "*Rawm* and *ʾishmām* are to the *ḥarakāt* as the
ḥarakāt are to the letters of lengthening and softness; I mean, *ʾalif*,
wāw, and *yāʾ* (الرَوم والإشمام نسبتهما الى هذه الحركات كنِسبة الحركات الى
حروف المدّ واللِين اعنى الألف والواو والياء)" (al-Khwārizmī 1968, 46, lines
8–10). In this 'Greek' analysis of vowels, the *ḥarakāt*—the 'short'
vowels—each have reduced quantity in comparison to the length
of the *matres lectionis*. Al-Khwārizmī suggests that by the same

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[11] 'School' as in 'doctrine, methodology'. The Arabic word is *madhhab*.

reckoning, *rawm* and *ʾishmām* are each a portion of the quantity of a *ḥaraka*. This quantitative interpretation of *ʾishmām* seems to have nothing to do with the long blended *ʾishmām* vowel that he said is in *qīla*, but it does relate to Sībawayh's description of *ʾishmām*, by which a speaker articulates only the slightest amount of /u/ while stopping on a letter. Sībawayh also mentions *rawm* as a reduced vowel and another way that a word in pause can end:

> وأما الذين راموا الحركة فإنّهم دعاهم إلى ذلك الحِرْصُ على أن يُخرجوها من حال ما لزمه إسكانٌ على كلِّ حال، وأن يُعْلِموا أنَّ حالها عندهم ليس كحال ما سَكَنَ على كلّ حال. وذلك أراد الذين أشمّوا؛ إلّا أنَّ هؤلاء أشدُّ توكيداً.

> As for those who desire [i.e., make *rawm*] the vowel, they are motivated by that desire to pronounce something when normally it must be silent, to make known that its condition for them is not like what was normally silent. That is also what those who did *ʾishmām* intended, except that they were more strongly restrained. (Sībawayh 1986, IV:168)

Sībawayh's *rawm* 'seeking, desiring' is similar to *ʾishmām*, in that it is a partial vowel pronounced instead of *sukūn* on a letter at the end of a word in pause, but it is stronger, in that it is not just a visual phenomenon. Instead, a speaker pronounces an ultra-short vowel, 'seeking' towards a complete *ḥaraka*, but only reaching a fraction of its length (Hoberman 2011). It is not limited to /u/, and can also occur as a shortened /a/ or /i/ at the end of a word that is *naṣb* 'accusative' or *jarr* 'genitive' (Sībawayh 1986, IV:171). This *rawm* is distinct from *ʾishmām* for Sībawayh, but al-Khwārizmī does not attempt to distinguish the two in the *ʾiʿrāb*

of the Greeks, and he does not list *rawm* among the pseudo-Khalīlian vowel terms.

The next pseudo-Khalīlian term is *qaʿr* 'lowest depth, depression', "which occurs at the beginnings of words, like the *ḍād* of *ḍaraba* (ما وقع في صدور الكَلِم نحو ضاد ضَرَبَ)" (al-Khwārizmī 1968, 45, line 1). Like *naṣb* and *fatḥ*, *qaʿr* refers to the vowel /a/, although it only applies to the first syllable of a word. Like *tawjīh* and *ḥashw*, this feature may indicate that it was originally a term used in the analysis of prosodic metre. Its meaning is likely related to the association of /a/ with the articulation point of *hamza*, deep in the throat, and hence at the lowest depth of all the vowels (see Kinberg 1987 and above, chapter 3, §2.2). The term may also be connected to the anatomical description of the 'laryngeal prominence',[12] for which Ibn Sīnā (d. 1037) says: "its *taqʿīr* 'depressing, deepening' is inwards and backwards (تقعيره إلى داخل وإلى خلف)" (al-Tayyan and Mir Alam 1983, 64; see also, Lane 1863, 2546). Given that al-Khwārizmī's only example of *qaʿr* is a *fatḥa* on the *mustaʿliya* letter *ḍād*, he might also be alluding to a degree of velarisation in the articulation of /a/.

After *qaʿr* is *tafkhīm* 'thickening', a common term that appears as early as *Kitāb al-ʿAyn* to indicate the allophonic realisation of *fatḥa* as /ɔ/ or /o/, especially in contrast to *ʾimāla* (i.e., /e/) (al-Nassir 1993, 103–4; Talmon 1997, 264; see above, chapter 3, §2.2). It was certainly in use from the earliest stages of Arabic linguistics to describe variations in recitation that could not be marked by the vowel points, but there is no reason to associate it specifically with al-Khalīl. It is also lexically similar to

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[12] The Adam's apple.

Jacob of Edessa's vowel descriptor ʿ*be* 'thick', which he applied to relatively-backed Syriac vowels like /ɔ/ and /o/ in the second half of the seventh century. That said, al-Khwārizmī does not demonstrate this usage of *tafkhīm*. Instead, he writes: "*Al-Tafkhīm* is what occurs in the middles of words on *ʾalif* with *hamza*, for example, *saʾala* (ما وقع في أواسط الكَلِم على الالفات المهزومة نحو سأل)" (al-Khwārizmī 1968, 45, lines 1–2). The vowel on the *hamza* in *saʾala* is a regular *fatḥa* (/a/),[13] so it is not clear what distinction al-Khwārizmī is trying to make. He may mean a vernacular pronunciation of the medial *hamza* in which long /ā/ replaces the glottal stop (*sāla* instead of *saʾala*). This specific usage of *tafkhīm* as the vowel of a medial hamza does not occur in *Kitāb al-ʿAyn*.

The next pseudo-Khalīlian vowel is *ʾirsāl* 'unbinding, easing, slackening', which al-Khwārizmī says is "what occurs at the ends [of words] on *ʾalif* with *hamza*, for example, the *ʾalif* of *qirʾa* (ما وقع في اعجازها على الالفات المهموزة نحو الف قراة)" (al-Khwārizmī 1968, 45, lines 2–3).[14] This vowel, too, is /a/, corresponding to the *fatḥa* before *tāʾ marbūṭa*, and again it seems that al-Khwārizmī may be alluding to a vernacular pronunciation in which the glottal stop is lost (thus *qirā* or the like). Talmon reports that in *Kitāb al-ʿAyn*, *ʾirsāl* denotes short /a/ in contrast to the lengthening of *madd*, but his only example states that for the *yāʾ* (i.e., the *ʾalif*

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[13] Or a *hamza bayna bayna*; see above, chapter 2, §2.2.

[14] The reading of *qirʾa* 'endemic disease' is based on the orthography as given by Van Vloten, which is قراه or قرأة (al-Khwārizmī 1968, 45, n. G). Talmon (1997, 264) suggests that this word should instead be read *qaraʾ(a)*. It may also be a defective spelling of *qirāʾa* 'reading, recitation'.

maqṣūra) at the end of the word *al-marʿizzā* 'fine-haired' (المَرْعِزّى),
"they hang the *yāʾ* as *mursila* [slackened] (عَلَّقوا الياء مرسلة)" (Ma-
khzumi 1985, II:334; Talmon 1997, 264). This line corresponds
with al-Khwārizmī's definition of *ʾimāla* 'bending down, inclina-
tion', which reads: "*ʾImāla* is what occurs on the letters before
slackened *yaʾ*s, for example, *ʿĪsā* and *Mūsā*; and *tafkhīm* is op-
posed to it (ما وقع على الحروف التي قبل الياءات المرسلة نحو عيسى وموسى
وضِدّها التفخيم)" (al-Khwārizmī 1968, 45, line 12, to 46, line 1).
Here he does recognise that *tafkhīm* is opposed to *ʾimāla*, and he
identifies the "slackened *yaʾ*s" of *ʿĪsā* and *Mūsā* (pronounced *ʿĪsē*
and *Mūsē*) as indicators of the /e/ allophone of *ʾalif*.

The concept of *ʾirsāl* thus seems to indicate two related phe-
nomena: the long vowel that results from the 'slackening' of a
glottal stop in the final syllable of words like *qirʾa*,[15] and the long
ʾimāla vowel represented by 'slackened' *ʾalif*s that hang below the
line as *ʾalif maqṣūra*. However, Ibn Jinnī also uses *mursila* to des-
ignate a type of *kasra* that is *not* blended with /u/. Writing again
regarding the *wāw* of *madhʿūr*, he says: "Just as the vowel before
this *wāw* is not a pure *ḍamma*, neither is it a slackened *kasra* (وكما
أن هذه الحركة قبل هذه الواو ليست ضمة محضة، ولا كسرة مرسلة) " (Ibn Jinnī
1993, 53). This description may be a reference to *ʾimāla* (and /e/)
as a type of *kasra* blended with *fatḥa* instead of *ḍamma*.

Taysīr 'facilitation, simplification, making easy' is one of
the few pseudo-Khalīlian terms that does not appear at all in
Kitāb al-ʿAyn, though Talmon (1997, 264) suggests it comes from
the vocabulary of Qurʾānic recitation. Al-Khwārizmī says that "it

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[15] Perhaps notably, if pronounced without the glottal stop, then the long
/ā/ in *qirā* could also undergo *ʾimāla*.

is the ʾ*alif*s which are removable from the ends of words, like the saying of God most high, *fa-aḍallūnā al-sabīlā* [Q. 33.67] (هي al-)"(الالفات المستخرجة من اعجاز الكلم نحو قول الله تعالى فَأَضَلُّونا السَّبِيلا Khwārizmī 1968, 45, lines 3–5). He is referring to the ʾ*alif* at the end of *al-sabīlā* 'the path', which is a *mater lectionis* representing the /a/ of the accusative case ending. Typically, a *fatḥa* alone marks the accusative, so this orthography is extremely irregular. This verse is the only instance in the Qurʾān where the case end-ing of *al-sabīl* is written *plene*. Al-Khwārizmī apparently considers this ʾ*alif* 'removable' (*mustakhraja*); it could be deleted without changing the meaning of the verse. Exactly how this property re-lates to *taysīr* is not clear, but perhaps al-Khwārizmī means that it 'facilitates' the reading of the final /a/ (notably at the end of the verse), or that the removal of this ʾ*alif* would 'simplify' the orthography.

Al-Khwārizmī lists ʾ*idjāʿ* 'laying something down, lowering something' as the name for /i/ in a medial syllable, giving the example of the *bāʾ* in ʾ*ibil* 'camels' (al-Khwārizmī 1968, 45, line 7). Talmon notes one line from *Kitāb al-ʿAyn*'s entry on the root *ḍjʿ*, which reads: "ʾ*idjāʿ* is in the rhymes which you make ʾ*imāla* (والإضجاع في القوافي أن تُميلها) " (Makhzumi 1985, I:212; Talmon 1997, 264), which seems to indicate that ʾ*idjāʿ* has a similar qual-ity to the approximate /e/ of ʾ*imāla*. It also suggests that the term's origin is in the technical vocabulary of prosody, which is appropriate given al-Khwārizmī's attribution of it to al-Khalīl and his note that it only occurs in specific syllables.[16] ʾ*Idjāʿ* appears

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[16] See *tawjīh* discussion above and Fischer (1985, 100).

among the other terms for /i/ in the pseudo-Khalīlian list (includ-ing *kasr, khafḍ,* and *jarr*), and Lane (1863, 1769) has already ob-served that its meaning relates to the phonetic 'inclination' and 'lowering' of *ʾimāla* and *khafḍ*. This connection tracks with the idea of 'bending down' towards the front of the mouth as a pho-netic feature of /i/ and /e/.

The last pseudo-Khalīlian term is *nabra* 'rising outward, raising the voice, swelling', which al-Khwārizmī says is "the *hamza* that occurs at the ends of verbs and nouns, like *sabaʾ*, *qaraʾa,* and *malaʾ* (الهمزة التي تقع في أواخر الأفعال والاسماء نحو سبأ وقرأ وملأ)" (al-Khwārizmī 1968, 46, lines 1–2). *Nabra* does mean *hamza* at least once in the lexical portion of *Kitāb al-ʿAyn*, and Talmon suspects that it comes from a non-technical usage (Talmon 1997, 264; see also, Makhzumi 1985, VIII:269), perhaps related to *hamza* 'rising outward' from the lowest articulation point in the throat or chest (Sībawayh 1986, IV:101, 176, 433; Ibn Jinnī 1993, 7, 43). Al-Khwārizmī may be stressing that a speaker raises the intensity of the voice to articulate full glottal stops for the *hamza*s of *sabaʾ* 'Sheba', *qaraʾa* 'he read', and *malaʾ* 'assembly',[17] rather than eliding them into a vernacular pronun-ciation with long final /ā/.

Al-Khwārizmī's definitions and evidence from other Arabic linguistic texts suggest that the vowel names which he attributes to al-Khalīl come from a variety of disparate sources. Besides the seven *ʾiʿrābī* and non-*ʾiʿrābī* names—all of which likely predate al-Khalīl—the other 11 pseudo-Khalīlian terms are a mixture of

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[17] The three examples are unvocalised in Van Vloten's edition.

items from prosody (*tawjīh, ḥashw,* perhaps *najr* and *ʾidjāʿ*), pho-nology (*ʾishmām, tafkhīm, ʾimāla,* perhaps *nabra*), and Qurʾānic recitation (*taysīr,* perhaps *ʾirsāl*). It might be correct to connect a few of the prosodic terms to al-Khalīl, but even then, many of al-Khwārizmī's definitions do not match the usage of these words in other contexts. Fischer (1985, 100) remarks that "undoubtedly, the list of technical terms attributed al-Khalīl is very incomplete, and does not allow one to conclude a consistent concept of his grammatical ideas from it." However, it seems that this chapter is merely a collection of miscellaneous words that al-Khwārizmī recognised as related to grammatical inflection or other spoken phenomena, the technical nuances of which he did not always understand. As such, there is no grammatical system to discern, save perhaps one that al-Khwārizmī himself construed to supple-ment the more mainstream *ʾiʿrāb* analysis in his preceding chap-ter. This 'system' cannot be linked to al-Khalīl with any degree of confidence. Nevertheless, many of the vowel names given in *Mafātīḥ al-ʿUlūm,* especially the ones found in other philological sources (e.g., *rawm, ʾishmām, tafkhīm, ʾimāla, ʾirsāl, ʾidjāʿ*), repre-sent genuine innovations to describe the phonology of non-cardi-nal vowels, whether for linguistic analysis, prosody, or Qurʾānic recitation.

2.0. Vowel Names in the Syriac Tradition

In the third chapter of the most recent edition of *Robinson's Par-adigms,* J. F. Coakley records the Syriac vowel names *zqɔpɔ* (/ɔ/), *ptɔḥɔ* (/a/), *rbɔṣɔ* (/e/), *ḥbɔṣɔ* (/i/), and *ʿṣɔṣɔ* (/u/) (Robinson and Coakley 2013, 13, n. 5; see also, Nöldeke 1904, §9). These names

are based on the thirteenth-century terminology of Bar Hebraeus, and some scholars have suggested that they are the sources of Arabic vowel terminology (Hoffmann 1880, XV–XVI; Merx 1889, 50; Versteegh 1993, 29–31). However, as we have seen, the earliest Syriac grammatical tradition did not have specific names for each vowel, instead describing them in terms of relative openness and backness with terms like 'wide' (*pte*), 'narrow' (*qaṭṭin*), 'thick' (*ʿbe*), and 'thin' (*nqed*). The following section traces the development of Syriac vowel names from their conceptual origins in the 'wide-and-narrow' language of Jacob of Edessa through to the eleventh-century grammars of the Eliases of Nisibis and Ṭirhan.

This development begins with the first hints of absolute naming in the *scholion* on *bgdkt* letters by Dawid bar Pawlos (fl. 770–800) before progressing to the more complete systems attested by Ḥunayn ibn Isḥāq's (d. 873) *Ktɔbɔ d-Shmɔhe Dɔmyɔye* (*The Book of Similar Words*) and the late ninth-century *mashlmɔnutɔ* manuscript BL Add. 12138 (Loopstra 2014; 2015). Evidence from the Syriac-Arabic lexica of ʿĪsā ibn ʿAlī (d. c. 900) Ḥasan bar Bahlul (fl. 942–968) reinforces this progression, showing a transition from partial sets of names to the complete—albeit unstandardised—sets in the grammars of Elias of Nisibis (d. 1046) and Elias of Ṭirhan (d. 1049). This history is also intertwined with parallel developments in the Arabic linguistic tradition, but even in its latest stages, Syriac grammarians maintained their basic principles of the early 'wide-and-narrow' comparative analysis.

2.1. The Earliest Sources for Absolute Names

The first Syriac term that might be considered an absolute vowel name comes from Jacob of Edessa's (d. 708) grammatical tractate, *On Persons and Tenses*. He refers to the pair of a supralinear dot plus a sublinear dot that represents the "intermediate" vocalisation of a three-way homograph as *mpaggdɔnɔ* 'bridling' (Phillips 1869, ܟ, line 15). It is apparently a graphemic name, comparing the two points on opposite sides of a word with the ends of a bridle on the sides of a horse's mouth. Theoretically, this term can indicate any vowel between two other vowels on the Syriac scale, but it almost always applies to a word with /a/. It is thus a *de facto* absolute name in most cases, even though Jacob of Edessa did not use it exactly as such.[18] Some later grammarians (c. thirteenth century) and modern(ish) scholars refer to *mpaggdɔnɔ* with the related term *pugɔdɔ* (Hoffmann 1880, XVI; Segal 1953, 23, n. 16, 172), but this form of the word does not appear in Jacob of Edessa's grammatical works.

After Jacob, the next source of vowel names is Dawid bar Pawlos (fl. 770–800), although we have seen that some of his terminology was still transitioning between relative and absolute vocalisation (see above, chapter 3, §1.1). He utilises four terms that approximate some absolute vowel names found in later

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[18] See discussion in Segal (1953, 23). It should be noted here that the 'vowel diagram' in the appendix of Segal's book is misleading. Even though the Syriac authors in the diagram appear to represent an evolutionary trajectory, Segal does not list them chronologically. He also 'modernises' some of the names to match the *ptɔħɔ* pattern (i.e., *CCɔCɔ*), even when they do not appear in that form in the Syriac sources.

sources, including: *zqiptɔ* 'stood upright', *ptiḥtɔ* 'opened', *hbiṣtɔ* 'pressed together', and *ʿṣiṣtɔ* 'constrained'.[19] His *hbiṣtɔ* and *ʿṣiṣtɔ* describe the letters *yod* and *waw* realised as /i/ and /u/, respectively. *Ptiḥtɔ* then indicates a letter with /a/, though it also seems to be a relative term that can describe relatively-open realisations of *yod* and *waw*.[20] Meanwhile, Dawid applies *zqiptɔ* only to letters with /ɔ/.

As addressed above (present chapter, §1.1), this earliest attestation of *zqp* 'standing upright' to indicate /ɔ/ post-dates the first usage of the *ʾiʿrābī* term *naṣb* 'standing upright' to name the Arabic /a/ by at least several decades. Recall that this term eventually became the name for the Arabic accusative case, but prior to Sībawayh's (d. 793/796) *Kitāb* it commonly referred to both the case and the vowel. Moreover, some grammarians—most notably, the Kufan al-Farrāʾ (d. 822) in his *Maʿānī al-Qurʾān* (*The Meanings of the Qurʾān*)—continued to name vowels with the *ʾiʿrābī* terms even in the first half of the ninth century (Owens 1990, 59; Versteegh 1993, 18–19). As a result, the use of *naṣb* as an Arabic name for /a/ was still current during the entire lifetime of Dawid bar Pawlos and the early career of Ḥunayn ibn Isḥāq (d. 873), who likewise refers to /ɔ/ with *zqp*. Furthermore, even as late as Sībawayh, *naṣb* could also designate relatively backed allophones of *ʾalif*, approximating /ɑ/ and /ɔ/, in contrast to the

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[19] MS Mardin, ZFRN 192 f. 199r, lines 11–18, and f. 200r, line 5; MS Jerusalem, SMMJ f. 166r, line 10. See Farina (2021). These forms are feminine past participles because they describe 'letters', which are feminine in Syriac (*ʾɔtɔ*, pl. *ʾatwɔtɔ*).

[20] Either as /e/ and /o/ or as diphthongs (see above, chapter 3, §1.1).

fronted allophones of *ʾimāla* (/ɛ/, /e/) (see above, chapter 3, §2.2).

This usage of *naṣb* is the most likely source of *zqp* for the Syriac name for /ɔ/. It appears that when Syriac grammarians began naming vowels in their absolute system, they followed their fundamental principles of 'wide-and-narrow' phonology, so *ptḥ* 'opening' was an obvious term for /a/. This association would have been reinforced by the cognate Arabic name *fatḥ* 'opening', which referred to Arabic /a/ from at least the early eighth century. Then when Syriac grammarians needed a name to describe /ɔ/, their secondary *a*-vowel, they calqued *naṣb* 'standing upright', the second Arabic name for /a/ which also covered backed allophones similar to /ɔ/.

The next earliest evidence of absolute vowel terms comes from the work of Ḥunayn ibn Isḥāq (809–873), an Arab Christian physician who lived in Abbasid Baghdad and played a critical role in the ninth-century translation movement (Talmon 2008, 165). He expanded the lexicographical text known as *Ktɔbɔ d-Shmɔhe Dɔmyɔye* (*The Book of Similar Words*), which was originally written by the seventh-century monk, ʿEnanishoʿ (Childers 2011, 144; see edition of Hoffmann 1880, 2–49). The bulk of the vowel terminology within was added as part of Ḥunayn's ninth-century recension (Hoffmann 1880, XIII), but, despite his fame in both Syriac and Arabic history, this text has been somewhat neglected in studies that discuss Syriac vocalisation. Kiraz does not deal with it, and Segal mentions it only in passing (see Kiraz 2015, 94–113; see also, Segal 1953, 32, n. 1, 52, n. 1). Revell and Versteegh likewise do not mention it in their comparisons of the

Arabic and Syriac phonological traditions, even though it is per-
tinent to their proposed chronologies of vowel naming (Revell
1975, 181, n. 2; Versteegh 1993, 29–32; see above, present chap-
ter, §1.1). In this expanded version of *Ktɔbɔ d-Shmɔhe Dɔmyɔye*,
Ḥunayn distinguishes six vowel qualities of Eastern Syriac—/ɔ/,
/a/, /e/, /i/, /o/, and /u/[21]—using a combination of phonetic
and graphemic descriptors.

Ḥunayn consistently indicates /a/ either by saying that a
letter is *ptiḥɔ* 'opened' (Hoffmann 1880, 6, lines 18–19, 14, lines
21–23, 33, line 22), or that "you *pɔtaḥ* [open] the [letter]" (Hoff-
mann 1880, 15, lines 1–2), where 'opening' is the act of adding
/a/ to a consonant. This second construction also appears in a
section of the text attributed to ʿEnanishoʿ (Hoffmann 1880, 18,
lines 6–8), suggesting that if Ḥunayn's transmission is reliable,
then the use of *pɔtaḥ* to describe Syriac /a/ may have begun as
early as the seventh century. Such an early usage could predate
even the 'wide-and-narrow' terminology used by Jacob of Edessa
(d. 708). Although less frequent than /a/, Ḥunayn designates /ɔ/
by saying that a letter is *zqipɔ* 'stood upright' (Hoffmann 1880,
10, line 13, 14, line 21), or that "you *zɔqep* [stand up] the [let-
ter]" (Hoffmann 1880, 14, line 23). He never uses the compara-
tively modern nominal forms *zqɔpɔ* or *ptɔḥɔ*.

Ḥunayn also refers to the two supralinear dots that indicate
/ɔ/ as *sheshltɔ* 'chain' (Hoffmann 1880, 6, line 13). In contrast to
the phonetic terms of 'opening' and 'standing upright', this is a
graphemic name that describes the appearance of the oblique
vowel points, which look like a 'chain' above the letter. *Sheshltɔ*

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[21] On the Eastern vowel inventory, see Knudsen (2015, 90–91).

is a cognate of the Tiberian Hebrew accent *shalshelet*, and *zɔqep* is a cognate of the Hebrew accent with the same name (see Dotan 2007, 638–39). It remains to be seen whether these similarities are simply coincidences or evidence of a greater conceptual connection.

Pɔtaḥ (/a/) and *zɔqep* (/ɔ/) are Ḥunayn's only terms that are similar to those listed by Bar Hebraeus, but they function more as adjectives that describe effects on letters than as independent names. As for /e/, Ḥunayn instructs to "put 'two dots' (*treyn nuqze*) below the [letter]" (Hoffmann 1880, 6, lines 18–19, 21, lines 16–17, 30, line 22, 31, lines 14–15), with horizontal and vertical pairs indicating variations of the vowel's quality.[22] He does not specifically describe /i/, and while he does not have explicit phonological terms for /o/ and /u/, he does write:

ܦܘܿܫܒ ܐܘܿܒ ܒܶܨܘܣܒ ܡ ܚܩܘܣܒ ܟܩܩܣ ܢܩܣ .ܘ. ܘܗ ܘܶܦܒܝܣܩ ܡܒܡ
ܕܡ̣ܠܘ. ܟܠ ܘܦ̣ܒ ܟܒ̈ܣܩ ܘܗ ܚܬܶܩܩܐ ܩܗ ܘܗ ܟܘܠܝ̣ܩ ܡܶܩܦܒܶ .ܘ. ܘܡ
ܒܨܘܣܒ ܒܐܢܝܩ ܠܝܩܩܒ̈ܝܩ ܡܒܶܝܟܚܒ ܠܩܦ ܀ ܡܘܗ ܘܠܩ ܦܒܝܣܩ ܡܒܡ
ܕܡ̣ܠܘ ܟܐܠܩ ܝܝܠܐܩ ܐܘܩ ܠܡ ܚܠ ܙܝ . ܚܠ ܩܘܦ ܒܚܩܘܣܒ ܠܒܝ̣ܚܩ
ܟܗ ܠܒ̈ܩܐܩ . ܩܗ ܠܝܒܩ ܡܝܩܦ ܡܶܩܩܘܒܒ̈ ܘܒܚܡܡ ܠܡ ܟܚܒܨ ܥܠܝܣܩ̈
ܦܩܦܝܩ̈ ܕܠܒܐ ܩܗܩ ܠܡ ܟܩ ܡ ܡܕܡ

> Also, distinguish *maruḥin* from *mrɔwḥin* by this sign: the one whose *mim* is opened relates to relief, which is said to be from evils or miseries. The rich give relief to the poor and do good to them. As for the one whose *mim* is not opened, but rather has the *sheshltɔ* [i.e., *zqɔpɔ*] on the *rish*: it relates to those who open wide a gate or house or some cleft, and it is said that they endow them with, as it were,

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[22] On such variation, see Segal (1953, 28–32), Kiraz (2012, I:70–71), and Knudsen (2015, 112–14).

> breadth and wideness, which they did not have before.
> (Hoffmann 1880, 33, line 17 to 34, line 2)

This passage offers a mnemonic device for remembering the difference between the homographs *maruḥin* 'relieving ones' and *mrɔwḥin* 'widening ones'. Ḥunayn says the first word "relates to relief (ʿ*al rwaḥtɔ*)," specifically relief "from evils (*bishɔtɔ*) or miseries (ʾ*ulṣɔne*)." But *rwaḥtɔ* has a double meaning here: besides 'relief', it also means 'space'. The phrase ʿ*al rwaḥtɔ* can thus be read as 'against space'. Similarly, *men ulṣɔne* can be interpreted as 'from/among narrow things'. In this way, Ḥunayn indicates that *maruḥin* has the lexical meaning of 'those giving relief', but on a phonological level, it is 'narrow' with respect to 'space'. That is, its vowel is the narrow /u/. Meanwhile, its homograph (*mrɔwḥin*) has the comparatively open /ɔw/,[23] approximating the rounded back vowel /o/. As we will see, the Eliases of Nisibis and Ṭirhan eventually used the roots of ʾ*ulṣɔne* and *rwaḥtɔ* when naming the vowels /u/ and /o/ (ʾ*alɔṣɔ* and *rwaḥɔ*), likely due to a familiarity with Ḥunayn's mnemonic device or a related concept.

As for *mrɔwḥin*, Ḥunayn says it "relates to those who open wide a gate or a house," bestowing them with 'breadth' (*shṭiḥutɔ*) and 'wideness' (*ptɔyutɔ*). Here we again see combined lexical and phonological meanings, as the articulation of /ɔw/ (or /o/) requires the opening the mouth and granting of 'wideness', at least in comparison to /u/. The word *ptɔyutɔ* even shares a root with what Jacob of Edessa called *pte* 'wide' vowels. These links suggest that that this line of 'wide-and-narrow' phonological thinking

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[23] On representations of this diphthong in Syriac, see Knudsen (2015, 115, 135).

persisted within the Syriac tradition from Jacob of Edessa, through Ḥunayn ibn Isḥāq, and into the eleventh century.

Similar mnemonic devices are found in Masoretic explanations of homographs. In fact, the Masoretes refer to such mnemonics as *simanin* 'signs' (Dotan 2007, 619), just as Ḥunayn remarks that the reader will distinguish these Syriac homographs 'by this sign' (*b-nishɔ hɔnɔ*). Steiner notes an example of a Masoretic mnemonic, writing:

> Another Masoretic note, preserved only in later sources,[24] provides even clearer support: דאכיל פתח פומיה ודלא אכל קמץ פומיה. This note refers to the contrast between Ezekiel 18:11 אֶל־הֶהָרִים אָכָל/עַל־הֶהָרִים לֹא אָכָל and Ezekiel 18:6, 15. Its literal meaning is: "He who eats opens his mouth; he who does not eat closes his mouth." As a directive for reading, it means: "He who reads *ʾkl* opens his mouth (in the final syllable); he who reads *lʾ ʾkl* closes his mouth (in the final syllable)." (Steiner 2005, 376)

This *siman* equates 'eating' (*ʾɔḵal*) with 'opening' (*pɔtaḥ*) the mouth, because אָכָל 'eating' in Ezek. 18.11 is pronounced with /a/. By contrast, it equates 'not eating' (*lo ʾɔḵɔl*) with 'closing' (*qɔmeṣ*) the mouth, because לֹא אָכָל 'not eating' is pronounced with pausal /ɔ/ in Ezek. 18.6. This explanation parallels the one that Ḥunayn gives for *maruḥin* and *mrɔwḥin*, incorporating both lexical and phonological information into a single line of instructions.

Another source of vowel names is the Eastern *mashlmɔnutɔ* manuscript BL Add. 12138. However, while the scribe Babai completed this codex in 899, he did not provide any vowel names

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[24] This one is from a fourteenth- or fifteenth-century source.

himself, and the names that do appear are in marginal notes that were mostly added by later hands (Loopstra 2015, II:XXXVII). Jonathan Loopstra (2015, II:XXXVIII–XXXIX, 439) identifies several examples of vowel terminology from *zqp* (/ɔ/) and *ptḥ* (/a/) among these notes, including imperative forms like *zqup* 'stand upright' and *lɔ teptaḥ* 'do not open' to instruct the vocalisation of particular words. While these instructions are the results of later emendations to the codex after 899, such terms correspond with Ḥunayn ibn Isḥāq's vocabulary, and would have been current in the late ninth and early tenth centuries. This connection implies that these notes are not *necessarily* much later than Babai, though they certainly could be. The only other vowel name in BL Add. 12138 is in six separate notes containing the active participle ʿɔṣṣ and the noun ʿṣɔṣɔ 'constraining', all of which indicate /u/ (Loopstra 2015, II:439). This term shares its root with Dawid bar Pawlos' term for describing a *mater lectionis* letter *waw* that represents /u/, as well as the name which Bar Hebraeus would eventually give to /u/. None of the notes in BL Add. 12138 provide additional explanations for the usage or pronunciation of the East Syriac vowels, and as Loopstra points out, no treatises on them are extant from before the eleventh century. There are, however, further sources for the names of the vowels prior to that time; specifically, the extant Syriac-Arabic lexica written in the wake of the ninth-century translation movements.

2.2. Vowel Names in Syriac-Arabic Lexica

Ḥunayn ibn Isḥāq was one of the most prolific scholars of the early Islamicate translation movement, and throughout this career he amassed knowledge of many Arabic, Syriac, and Greek technical terms. He compiled much of this information into a Syriac-Arabic lexicon, but his original text is no longer extant (Brock 2016, 11–12; see also, Versteegh 1977, 3), and its contents survive only via the work of later lexicographers. One such lexicographer was Ḥunayn's student, ʿĪsā ibn ʿAlī (d. c. 900),[25] another Christian physician who compiled a Syriac-Arabic *Lexicon* in the latter half of the ninth century (Hoffmann 1874; Gottheil 1908; 1928; Butts 2009, 59–60). In the preface to this lexicon, Ibn ʿAlī explains that he based his book on the lexica of Ḥunayn and another scholar, Ishoʿ of Merv, expanding their work with additional words (Hoffmann 1874, 3, lines 3–7; Butts 2009, 61). This text seems not to have been considered a closed corpus, and was expanded in at least four recensions after Ibn ʿAlī completed the original version. It is not clear precisely when all of these recensions occurred, but at least one happened near the end of the ninth century (Butts 2009, 61–62), and the following discussion assumes that most of the others took place before the Eliases of Nisibis and Ṭirhan completed their grammars in the first half of the eleventh century. This assumption is based on the fact that

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[25] Also known as Ishoʿ bar ʿAlī. There is some confusion among both medieval and modern sources that conflate this individual with other medieval scholars who have similar names. Butts (2009) has shown that the author of this lexicon is most likely the ʿĪsā ibn ʿAlī who was the student of Ḥunayn.

Ibn ʿAlī's *Lexicon* does not define any of the technical terms that the eleventh-century Eliases use to name vowels, but does describe vocalisation using phonetic participles like Ḥunayn did. Furthermore, this discussion relies on the editions of Hoffmann and Gottheil. The former published a handwritten version of the first half of the *Lexicon* (*ʾalep–mem*) in 1874, based a single recension, while the latter published a critical edition of the second half as two volumes in 1908 (*nun–ʿayn*) and 1928 (*pe–taw*) (see Butts 2009, 59).

   As a source for technical definitions of vowel names, Ibn ʿAlī's *Lexicon* is surprisingly unhelpful. None of the entries on words from the roots *ptḥ*, *zqp*, *rbṣ*, *ḥbṣ*, or *ʿṣṣ*, nor any of the roots used for vowel names in other sources, contain a definition that explains a technical linguistic term. However, the text does indicate the proper pronunciation of certain words by describing their letters with passive participles, specifically: *zqipɔ* 'stood upright', *ptiḥɔ* 'opened', *ḥbiṣɔ* 'pressed-together', *rbiṣɔ* 'compressed', and *zribɔ* 'narrowed, contracted'. Each of these terms may also be abbreviated (e.g., *zr* and *zri*), rather than written with full orthography. They occur infrequently, but when they do appear, it is usually after the text introduces a new word, using the construction: "[lexeme], while [participle] is [letter]." This construction matches that in Ḥunayn's *Ktɔbɔ d-Shmɔhe Dɔmyɔye*.

   For example, with *zqipɔ* 'stood upright', the *Lexicon* reads: "*ɔwkel*, while the *ʾalaph* is *zqiptɔ* (ܐ ܐܡܗܦ ܚܕ ܠܝܕܗܟ̈)" (Hoffmann 1874, 16). That is, for the word *ɔwkel*, the initial letter *ʾalaph* is 'stood upright', indicating that it is pronounced with /ɔ/. *Ptiḥɔ*

'opened' occurs more frequently in the text than *zqipɔ*, but it fol-
lows the same construction: "*ʾalep*, while the *ʾalaph* is *ptiḥɔ* (ܐܠܦ
ܗܕ ܐ)" (Hoffmann 1874, 31).[26] This line means that in the word
ʾalep, the letter *ʾalaph* is pronounced with /a/. *Ḥbiṣɔ* 'pressed to-
gether' is the rarest of the five vowel terms in the lexicon, but in
at least one instance, the text has: "*zirɔ*, while the *yod* is *ḥbiṣɔ*
(ܐܝܢܐ ܗܕ ܚܒܝܨܐ ,)" (Hoffmann 1874, 126). In accordance with Ja-
cob of Edessa's original principles of 'wide-and-narrow' vowels,
ḥbiṣɔ here describes the closure of the mouth when articulating
/i/. However, in contrast to the descriptions of *a*-vowels—which
are not written with *matres lectionis*—rather than *ḥbiṣɔ* modifying
the consonant *zayin*, here it is the *mater* letter *yod* that is 'pressed
together'. *Ḥbiṣɔ* is also the first of the *Lexicon*'s terms that does
not appear in *Ktɔbɔ d-Shmɔhe Dɔmyɔye*, as Ḥunayn used no spe-
cific term for /i/.

The *Lexicon*'s two terms *rbiṣɔ* 'compressed' (e.g., Hoffmann
1874, 23, 31) and *zribɔ* 'contracted, narrowed' (e.g., Hoffmann
1874, 16, 26, 29, 31, 32) also do not occur in *Ktɔbɔ d-Shmɔhe
Dɔmyɔye*. Both describe letters with *e*-vowels, clearly contrasting
the relative closedness of their articulation with the openness of
/a/, but their exact nuance is difficult to determine. It seems that
they are broadly interchangeable, or at least that the person who
added them (either Ibn ʿAlī himself or a redactor) perceived them
as representing the same vowel quality (/e/). A more extensive
study is needed to determine their precise applications. It may
simply be that the instructions with *zribɔ* and *rbiṣɔ* are the prod-

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[26] Note the abbreviated Syriac ܗܦ for *ptiḥɔ*.

ucts of separate recensions of the *Lexicon* by editors who pre-
ferred different terminology. In any case, it is significant that the
literal meaning of both terms for *e*-vowels indicate 'narrowed'
articulation in contrast to the 'wider' *a*-vowels. This contrast is a
clear continuation of Jacob of Edessa and Dawid bar Pawlos' ear-
lier relative vowel comparisons even after the Syriac absolute vo-
calisation system had solidified.

　　Rbiṣɔ here is also our first hint of a vowel name (the later
rbɔṣɔ) that has caused some confusion in the realm of Syriac and
Arabic vocalisation. Revell and Versteegh suggest that *rbɔṣɔ* is
lexically equivalent to *khafḍ* 'lowering', an Arabic name for /i/,
and thus *khafḍ* is a potential calque of *rbɔṣɔ* (Revell 1975, 181, n.
2; Versteegh 1993, 30–31).[27] Such a calque would imply that
eighth-century Arabic grammarians borrowed a Syriac vowel
name for use in Arabic. However, vowel terminology derived
from *rbṣ* is not attested prior to the ninth-century *Lexicon* of Ibn
ʿAlī, far too late for it to have been adopted by pre-Sībawayhan
Arabic grammarians.[28] The proposed calque is also lexically un-
tenable. *Khafḍ* does mean 'lowering', and as we have seen, it oc-
curs in the Arabic grammatical tradition to indicate the relatively
'low' position of the front of the mouth in contrast to the 'higher'
positions of *naṣb* 'standing upright' (/a/) and *rafʿ* 'rising' (/u/).[29]
By contrast, *rbɔṣɔ* means 'compressing', 'confining', 'gripping', or
'squeezing' (R. Payne Smith 1879, 3801; J. Payne Smith 1903,

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[27] For *khafḍ* as a vowel name in Arabic, see §4.1.1.

[28] Compare Posegay (2020, 210), which is mistaken.

[29] See §3.2.2 and §4.1.1.

527; Sokoloff 2009, 1430). The same root can indicate 'depressing' only in the sense that compressing an area of ground will create a 'depression',[30] and it is from this sense that Revell and Versteegh seem to have come up with the glosses of 'depressing' or 'lowering'.[31] Instead of stretching for this less common definition, it is simpler to interpret *rbɔṣɔ* as the 'compressing' movement of the lips while articulating /e/ relative to more-open vowels like /a/. This interpretation is wholly unrelated to *khafḍ* and follows the logic of the 'wide-and-narrow' convention that pervades practically all other Syriac vowel naming.

The second major extant Syriac-Arabic dictionary is the *Syriac Lexicon* of Ḥasan bar Bahlul (fl. 942–968), a tenth-century lexicographer who compiled his work from the earlier lexica of translators like Ḥunayn ibn Isḥāq and Ḥenanishoʿ bar Serosheway (d. c. 900). We have already seen him as a key link for connecting the idea of *muṣawwitāt* 'sounding' letters between the Syriac, Arabic, and Hebrew traditions (see above, chapter 2, §1.0), and his *Lexicon* also provides information for the use of Syriac absolute vowel names in the mid-tenth century. However, like Ibn ʿAlī's lexicon, Bar Bahlul's book underwent several revisions after his death, and Duval's edition contains some additions that are at least as late as the thirteenth century (Taylor 2011).

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[30] This gloss is confirmed by the medieval lexica (Duval 1901, 1868; Gottheil 1928, II:376).

[31] A confounding factor may be R. Payne Smith's (1879, 3801) entry on the Syriac verb *rbaṣ*. He begins it by listing the apparent Arabic etymological cognate *rabaḍa*, which does mean 'to lay down', but this meaning does not apply to the Syriac verb.

Also like Ibn ʿAlī, Bar Bahlul does not give many explicit definitions of technical linguistic terms, and instead only explains the literal meaning of words that are used as vowel names in other sources. Nevertheless, his entry on *zqipɔ* does hint toward the use of the Arabic *ḍamma* (/u/) to name at least one vowel, and he connects the word *sheshlɔ* with *jarr*, an Arabic name for /i/. More often, he uses the passive participle terms to describe the pronunciation of particular words, including: *zqipɔ, ptiḥɔ, rbiṣɔ,* and *zribɔ. Ḥbiṣɔ* may also occur, though much less often than these other four terms. I have only noticed it in a single footnote, where Duval (1901, 385, n. 1) claims it appears in one manuscript instead of *zribɔ.* I have searched approximately one fifth of Duval's edition, but the text is over 2000 pages and it is inevitable that some terms evaded me. I have found no evidence of terms for /o/ and /u/, which notably are (almost) always written with a *mater lectionis* in Syriac.

Zqipɔ is the most frequent term that occurs in this text (e.g., Duval 1901, 45, 385, 401, 404, 406, 408, 417, 438, 448, 449, 1452), followed by *ptiḥɔ* (e.g., Duval 1901, 28, 398, 406, 408, 413, 432, 518). Like Ibn ʿAlī, Bar Bahlul uses these passive participles as attributes of consonants with the vowels /ɔ/ and /a/, respectively. He even follows the same syntax as Ibn ʿAlī, including lines like: "*baliʿ* (خلبـ), while the *bet* is *ptīḥɔ*" (Duval 1901, 398). *Rbiṣɔ* (e.g., Duval 1901, 9, 45, 438) and *zribɔ* (e.g., Duval 1901, 385, 418, 441) are much less common than *zqipɔ* and *ptiḥɔ,* which again makes it difficult to determine their exact functions, but they both indicate some type of *e*-vowel.

In addition to the regular use of the aforementioned Syriac terms, in his entry on the lexeme *zqipɔ*, Bar Bahlul includes the line: "The *zɔqupe* set up a finger. I say one should not give *al-ḍamma* (ܐܡܬܩܥ ܐܝܡܗ ܝܚܟ ܐܩܘܠ ܠܐ ܝܥܛܝ ﺍﻟﻀّﻤّﺔ)." *Al-ḍamma* 'pressing together' is the Arabic name for /u/, so this sentence seems to suggest that, at least according to Bar Bahlul, one should not pronounce /u/ in the word *zɔqupe* 'crucifiers'. His implied preference would be an East Syriac pronunciation with /o/: *zɔqope*. I have found no evidence in the *Lexicon* of other names that refer to /u/, so in this case Bar Bahlul may have adopted an Arabic vowel name to supplement his Syriac terminology. It is also worth noting that the lexical meaning of *ḍamma* overlaps with two other Syriac names for /u/, *ʿɔṣɔ* 'contracting, constraining' and *ʾalɔṣɔ* 'narrowing, pressing, crowding', although neither occurs as a vowel name in Bar Bahlul's *Lexicon*.

Furthermore, Bar Bahlul (or at least, the copyist of the manuscript for Duval's edition) makes an interesting statement in a lexical entry on *sheshlɔ* 'chain', the same word as the term that referred to the two-dot vocalisation points in Ḥunayn's *Ktɔbɔ d-Shmɔhe Dɔmyɔye* and would eventually come to mean /e/ in the eleventh-century grammars. They write, "*Sheshlɔ*, in another manuscript, is *jarr*, that is, the letter when it is 'dragged' (*jurra*) (ܥܥܠܗ ܚܝ ﺟَﺮّ ﺍﻋﻨﻰ ﺍﻟﺤﺮﻑ ﺍﺫﺍ ﺟُﺮّ). This line seems to identify *sheshlɔ* with *jarr* 'dragging, pulling', an Arabic name for the genitive case that also served as an early name for /i/ (see Versteegh 1993, 125–30; Talmon 1997, 194–97).[32]

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[32] See also, al-Zajjājī and al-Khwārizmī's discussions of *jarr* above, present chapter, §§1.1–2.

While Dawid bar Pawlos' (fl. 770–800) *scholion* on *bgdkt* letters and Ḥunayn Ibn Isḥāq's (d. 873) *Ktɔbɔ d-Shmɔhe Dɔmyɔye* are the earliest extant sources for Syriac absolute vowel terminology, the Syriac-Arabic lexica of Ibn ʿAlī (d. c. 900) and Bar Bahlul (fl. 942–968) provide an important link between their earlier naming conventions and those of later grammarians. Like Ḥunayn, these two lexicographers applied the convention of describing vocalisation with passive participles, but they also expanded on Ḥunayn's terminology with the addition of *ḥbiṣɔ* 'pressed together', *rbiṣɔ* 'compressed', and *zribɔ* 'narrowed'. These terms all have similar meanings, and they deliberately contrast the Syriac *e*- and *i*-vowels as relatively 'closed' in comparison to the relatively 'open' *a*-vowels. This contrast echoes the earlier 'wide-and-narrow' relative comparisons of Jacob of Edessa and demonstrates a continuity in the Syriac conceptions of vowel phonology between the seventh and eleventh centuries. Still, none of Dawid, Ḥunayn, Ibn ʿAlī, and Bar Bahlul had full sets of terms that named every Syriac vowel. Such a set is not attested until the eleventh-century grammars of the Eliases of Nisibis and Ṭirhan.

2.3. Absolute Naming in the Eleventh-century Grammars

The two most prominent representatives of eleventh-century Syriac grammar are Elias of Nisibis (d. 1046) and Elias of Ṭirhan (d. 1049) (Merx 1889, 109, 137, 154; Teule 2011b; 2011a), two bishops who inherited the terminological conventions of earlier Syriac vocalisation. They were both bilingual and well-versed in

Arabic and Syriac grammar, and many of their works are either in Arabic or tailored for Arabic-speaking audiences. Through these works—particularly their respective Syriac grammars—it is clear that they described vowels in much the same way as Ibn ʿAlī and Bar Bahlul, but they also adapted terms from the Arabic grammatical tradition to name the Syriac vowels. Their vowel names approach the forms of the names that appear in Bar Hebraeus and modern Syriac grammars, but they do not exactly match these later terms (Segal 1953, 32–33). Perhaps more interestingly, the Eliases' vowel names do not even match each other, and each must be explained by different interpretations of the 'wide-and-narrow' or 'high-and-low' principles of earlier Syriac vowel phonology.

Elias of Nisibis was born in northern Iraq in 975, and he became the Metropolitan of Nisibis in 1008 (Bertaina 2011, 198). In the second chapter of his *Turrɔṣ Mamllɔ Suryɔyɔ* (*The Correct Form of Syriac Speech*), Elias discusses the 'moved letters' (*ʾatwɔtɔ mettziʿɔnyɔtɔ*), by which he means the vowels (see above, chapter 2, §2.2). He begins by comparing the Arabic and Syriac vowel inventories:

> ܐܬܘܬܐ ܗܟܝܠ ܡܬܬܙܝܥܢܝܬܐ ܒܝܕ ܐܪܒܝܐ ܠܬܠܬ ܐܕܫܐ ܡܬܦܠܓܢ܆ ܘܒܝܕ ܣܘܪ̈ܝܝܐ ܡܥܪ̈ܒܝܐ ܠܚܡܫܐ ܐܕܫܐ܂ ܝܬܝܪ ܕܝܢ ܒܝܕ ܡܕܢܚܝܐ ܀ ܠܫܒܥܐ ܐܕܫܐ ܡܬܦܠܓܢ

> Then the moved letters, among the Arabs, are divided into three types, and among the Western Syrians, into five types. Then among we Easterners, they are divided into seven types. (Gottheil 1887, ܝܘ, lines 20–25)

Being an Eastern Metropolitan himself, Elias apparently attached some level of prestige to larger vowel inventories, and from here

we must proceed with caution. He does name seven vowels, but
that does not necessarily mean that he also distinguished seven
discrete vowel qualities in his pronunciation of Syriac. Instead,
he may be preserving a historical classification of a seventh
vowel as a point of pride; as we will see, his Eastern contempo-
rary, Elias of Ṭirhan, distinguishes only six vowel qualities (Segal
1953, 33; Loopstra 2015, II:XXXVII).

Elias of Nisibis proceeds with a simple list, writing:

ܠܩܦܬܐ ܐܡܪܢܐ. ܘܠܪܒܝ ܐ̈ܠ ܘܠܦܬܝܚܬܐ. ܘܠܡܢ ܕܩܕܡ ܪܘܝܚܬܐ. ܘܠܡܢ
ܕܩܕܡ ܐܠܝ̈ ܐ̈ܠ. ܘܠܡܢ ܕܩܕܡ ܡܣܩܬܐ. ܘܠܡܢ ܕܩܕܡ ܚܒܝ̈ ܐ̈ܠ

I say: the *zqipɔtɔ*, the *rbiṣɔtɔ*, and the *ptiḥɔtɔ*; those which
are before the *rwiḥɔtɔ* and those before the *ʾaliṣɔtɔ*; those
before the *massqɔtɔ* and those before the *ḥbiṣɔtɔ*. (Gottheil
1887, ܘ, lines 25–28; see also, Merx 1889, 112)

Elias uses feminine plural passive participles for each vowel term,
with the implication that they describe 'letters' (*ʾatwɔtɔ*) in the
same way as earlier writers like Ḥunayn, Ibn ʿAlī, and Bar Bahlul
who said *zqipɔ* and *ptiḥɔ*. However, Ibn ʿAlī and Bar Bahlul's lex-
ica each only had Syriac terms for four or five vowels, and they
did not name the vowels that are typically represented by *matres
lectionis*. By contrast, Elias does refer to those vowels here. For
example, when he says "those before the *ḥbiṣɔtɔ*" he means letters
which come immediately before a *yod* that represents the vowel
/i/. This construction implies that the *mater lectionis* itself is the
letter which is *ḥbiṣtɔ* 'squeezed, pressed together'.

Elias then describes each vowel individually, including in-
formation on their function and their graphemes. He begins with
zqipɔtɔ 'ones stood upright', saying that they include the *ʾalaph*
and *dalat* in *ʾɔdɔm* 'Adam', and the *lamad* and *heʾ* in *ʾalɔhɔ* 'God'

(Gottheil 1887, ܚ, lines 29–30). Additionally, a letter which is *zqiptɔ* is marked by *treyn nuqze* 'two dots' "placed one over the other in a straight line above the letter, and they are called *sheshlɔ da-lʿel* 'a chain above' (ܟܬܒܬܗܘܢ ܗ̇ܝ ܠܥܠ ܐ̇ܟܘܝܬܐ ܐܝܢܐ̈ܐܗ ܣܡ ܕܠ ܣܡ ܠܝܠ ܡܟܡ ܕܠܝܠ ܗ̇ܟܘܚܘ. ܡܘܗܡܘ. ܡܫܡ̈ ܝܢܘܗܡ ܐܬܘܗܬܐ)" (Gottheil 1887, ܠ, lines 6–8). Both of these descriptions have parallels in *Ktɔbɔ d-Shmɔhe Dɔmyɔye*, where Ḥunayn ibn Isḥāq also referred to letters with /ɔ/ as *zqipɔ* and to the two-dot supralinear sign of this vowel as a *sheshltɔ* 'chain' (see above, present chapter, §2.1). Elias also quotes at least two of Ḥunayn's other books in this grammar and in the sixth dialogue of his *Kitāb al-Majālis* (*The Book of Sessions*) (Gottheil 1887, 36, n. 49, 29*–30*, no. 49; ܛ, line 32; Bertaina 2011, 202–3; see Samir 1975), reinforcing the possibility that they had access to the same pedagogical tradition of vowel naming.

Next, the *rbiṣɔtɔ* 'compressed ones' are like the *ḥet* in *ḥelmɔ* 'dream' (Gottheil 1887, ܚ, lines 30–31). Like in the tenth-century lexica, and even extending as far back as Jacob of Edessa's *pte* 'wide' and *qaṭṭin* 'narrow' comparisons, this 'compression' is most likely a description of the relative closedness of the mouth when articulating /e/, in contrast to more open vowels like /a/. This vowel is marked by 'two dots' (*treyn nuqze*) straight below a letter, called *sheshlɔ da-ltaḥt* 'a chain below' (Gottheil 1887, ܠ, lines 9–10). In contrast to Ḥunayn, who only used *sheshltɔ* for the supralinear sign of /ɔ/, Elias adopts *sheshlɔ* as the name for any vertical two-dot vocalisation sign, regardless of its position.

The next vowel is on letters that are *ptiḥɔtɔ* 'opened', which Elias says is the *ʾalaph* in *ʾalɔhɔ* and the *ʿayin* in *ʿaprɔ* 'dust'

(Gottheil 1887, ܚ, lines 31–32). Like his predecessors, Elias' use
of this term again maintains the contrast between the 'openness'
of the mouth when articulating /a/ and the 'compression' of /e/.
He states that the sign for this /a/ is two dots, with one above
and one below the letter (Gottheil 1887, ܠ, lines 11–13). These
first three terms—*zqipɔ*, *rbiṣɔ*, and *ptiḥɔ*—form an important triad
for Elias, as they are the vowels that do not typically occur with
a *mater lectionis* in Syriac orthography.

Elias' fourth vowel is on letters which come before the
rwiḥɔtɔ 'broadened ones', like the *ʾalaph* in *ʾo* 'or' and the *kaph* in
ʾarkonɔ 'magistrate'. The 'broadened one' in each of these cases
is the *mater lectionis* letter *waw*, which signifies the vowel /o/ on
the consonant that precedes it. The term itself describes the
'broadening' of the mouth during the articulation of /o/ in con-
trast to the closedness of /u/, the other vowel which a *waw* can
represent in Syriac. The term *rwiḥɔ* shares a root with *rwaḥtɔ* 're-
lief, space', the word that Ḥunayn used as part of his mnemonic
device to explain the difference between the homographs
maruḥin 'relieving ones' and *mrɔwḥin* 'widening ones' (Hoffmann
1880, 33, line 17, to 34, line 2; present chapter, §2.1). Elias may
have adopted a term for /o/ specifically related to 'space' due to
familiarity with this mnemonic from Ḥunayn's work, or a related
pedagogical source in the same vein. He further notes that the
sign of *waw rwiḥtɔ* is a single dot placed above *wāw* (Gottheil
1887, ܠ, lines 13–14).

The fifth vowel is on letters that are before the *ʾaliṣɔtɔ* 'nar-
rowed ones', meaning instances where a *mater lectionis waw* rep-
resents /u/, like the *nun* in *nurɔ* 'fire'. These *waw*s are 'narrowed'

specifically in contrast to the 'broadened' /o/. Compared to every other vowel, /o/ would be considered more 'closed', and /u/ alone requires more closure during its articulation. The two terms *rwiḥɔ* and *ʾaliṣɔ* thus make sense in the context of each other— and in context of their shared *mater lectionis*—by maintaining the principle of relative comparisons that extends back to Jacob of Edessa. *ʾAliṣɔ* also shares a root with *ʾulṣone* 'miseries, narrow things', another word from Ḥunayn's mnemonic which he associated with *maruḥin* (with /u/), rather than *mrɔwḥin* (with /ɔw/). The sign for this vowel is *waw* with a dot below it (Gottheil 1887, ﻭ, lines 14–15).

Elias' sixth vowel is on letters before the *massqɔtɔ* 'raised ones',[33] which are instances where a *mater lectionis yod* represents /e/. He gives examples of the *ʾalaph* in *ʾel* 'El' and the *bet* in *bel* 'Jupiter' (Gottheil 1887, ﻭ, lines 1–2), and here we see a problem reminiscent of the *rbiṣɔ-ẓribɔ* distinction in the tenth-century lexica. By the eleventh century, the East Syriac quality of the vowel in both of these words was probably the same as the first vowel in *ḥelmɔ* (see Knudsen 2015, 91–92); that is, the vowel which Elias described as *rbiṣɔ* (/e/). Based on his citations of *ʾel* and *bel*, the only apparent difference between a letter which is before a *yod massaqtɔ* and a letter which is *rbiṣɔ* is the presence of a *mater lectionis yod*, though it may also be relevant that both of these examples are non-Syriac loan words. It would seem then that Elias differentiates *rbiṣɔ* and *yod massaqtɔ* solely on the basis of orthography, even though they likely sounded the same in his

[33] This term is distinct from the accent dot with a similar name (Loopstra 2015, II:XLI, n. 142).

speech, and it is this distinction that allows him to count seven vowels in the Syriac of the 'Easterners'. He notes that the sign of this vowel is two dots below the letter which precedes the *yod massaqtɔ* (Gottheil 1887, ܠ, lines 15–16).

The phonetic meaning of *massaqɔ*[34] 'raised up' here is not based on the wide-and-narrow comparisons of the other vowel names. It is a C-stem participle from the root *slq* 'raising', which stands out from the G-stem participles that Elias uses to describe the other vowels. This discrepancy suggests that it came into use separately from the other terms. It is not a technical term in the earlier lexica, nor is there a similar name in the works of Ḥunayn, Dawid bar Pawlos, or Jacob of Edessa, so it is most likely a tenth- or eleventh-century innovation. Its closest analogue in Syriac linguistics might be the early relative use of *men lʿel* 'above', which indicated that a word's vowels were pronounced farther back than those of its homograph (see above, chapter 3, §1.1). Elias likely had sufficient knowledge of Jacob of Edessa's work to make this same analysis, as he cites Jacob's *Turrɔṣ Mamllɔ Nahrɔyɔ* in the introduction of his own *Turrɔṣ Mamllɔ Suryɔyɔ* (Gottheil 1887, ܣ).

By analogy with Elias' description of the two vowels that *waw* represents (i.e., /o/ and /u/), his *massaqɔ* (/e/) should be understood in relation to the second vowel which *yod* can represent: /i/. In that sense, /e/ is indeed the more-backed of the pair, and is thus 'raised' above the position of /i/. As we will soon see with Elias of Ṭirhan, it is also likely that *massaqɔ* is a calque of

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[34] Never *ʾassɔqɔ*, despite what Merx (1889, 157, n. 2) and Segal (1953, 33) suggest.

the Arabic inflectional term *marfūʿ* 'raised up', (i.e., given /u/), likewise related to a 'high' backed position (see above, chapter 3, §2.2). While it is not clear that Elias of Nisibis is actually calquing *marfūʿ* here, it is certain that he could have, as he displays a proficient understanding of the Arabic inflectional system in the sixth dialogue of his *Kitāb al-Majālis* (Samir 1975, 634–49).

Elias' seventh and final vowel is on letters before the *ḥbiṣɔtɔ* 'squeezed, pressed-together ones', which include the *ʾalaph* in *ʾidɔ* 'hand' and the *dalat* in *zaddiqɔ* 'righteous' (Gottheil 1887, ܠ, lines 2–3). The *ḥbiṣtɔ* in this case is a *yod* acting as a *mater lectionis* for /i/, which corresponds to the rare occurrences of *hbiṣɔ* in the Syriac-Arabic lexica. It is clearly another phonetic description, meant to contrast the closedness of /i/ with the comparatively open articulation of /a/ and /ɔ/, and in some more precise sense Elias may have considered it a greater indicator of closure than *rbiṣɔ* 'compressed' (i.e., /e/). Its sign is a *yod* with a sublinear dot (Gottheil 1887, ܠ, lines 17–18).

At the end of his list of vowels, Elias also introduces nominalised forms of the Syriac vowel terminology, naming *ʾaliṣutɔ* 'narrowing' (/u/), *rawiḥutɔ* 'broadening' (/o/), *massɔqutɔ* 'rising' (/e/), and *ḥabiṣutɔ* 'squeezing, pressing together' (/i/) (Gottheil 1887, ܠ, lines 4–5). These four vowels are notably the ones represented by the *matres lectionis waw* and *yod*, and they are the four vowels which do not have names (or, for *ḥbiṣɔ*, is named only rarely and dubiously) in the aforementioned works of Ḥunayn, Ibn ʿAlī, and Bar Bahlul. These nominal forms may well

be Elias of Nisibis' own innovations from the first half of the eleventh century. They do not appear in the grammar of Elias of Ṭirhan, but this second Elias brought innovations of his own.

Like Elias of Nisibis, Elias of Ṭirhan (d. 1049) was an East Syriac bishop who lived in an increasingly Arabicised linguistic world, so he produced his own Syriac grammar, the *Memrɔ Gramaṭiqɔyɔ* (*The Grammatical Essay*) for an Arabic-speaking audience. He uses various vowel terms throughout this text, and he names six discrete qualities in its twenty-seventh chapter: *zqɔpɔ* (/ɔ/), *ptɔḥɔ* (/a/), *rbɔṣɔ* or *sheshlɔ* (/e/), *massaqɔ* or *rwaḥtɔ* (/o/), *ḥbɔṣɔ* (/u/), and *yod* (/i/) (Baethgen 1880, ܝܚ, lines 15–18). He also periodically describes letters with certain vowels by using passive participles from these roots, including: *rbiṣɔ* (/e/), *rwiḥɔ* (/o/), and *ḥbiṣɔ* (/u/) (e.g., Baethgen 1880, ܝ, lines 1–6). Broadly speaking, these terms match the more modern Syriac vowel names, although when paired with their phonemes they do not all correspond with the modern terminology. Most strikingly, the names for /u/ and /o/ conflict with the vowel list in Elias of Nisibis' grammar, and /i/ has the same name as its *mater lectionis*. These discrepancies reveal that Syriac vocalisation terminology was still in flux during the first half of the eleventh century, even while individual grammarians remained internally consistent with respect to the Syriac tradition of 'wide-and-narrow' comparisons.

Zqɔpɔ and *ptɔḥɔ* here refer to /ɔ/ and /a/, respectively, exactly as expected, and in line with the vowel terminology of Ḥunayn ibn Isḥāq, the lexicographers, and Elias of Nisibis. However, for Elias of Ṭirhan, these names are distinct nominal forms,

rather than passive participles that describe vocalised conso-
nants. Meanwhile, he refers to /e/ with both *rbɔṣɔ* and *sheshlɔ*,
although he prefers *rbɔṣɔ*. Apparently, he worked within a gram-
matical tradition in which the graphemic name for a two-dot
sign—*sheshlɔ*—had lost its meaning related to /ɔ/, and now re-
ferred only to the sublinear two-dot sign of /e/. This term thus
became interchangeable with *rbɔṣɔ*, the phonetic description of
that vowel (Baethgen 1880, ܐܠ, line 21, to ܠܐ, line 8, ܠܠ, lines
18–22). This usage contrasts Elias of Nisibis, who used *sheshlɔ da-
l‘el* and *sheshlɔ da-ltaḥt* to describe the shape and position of the
two-dot signs for /ɔ/ and /e/.

While Elias favours these nominalised vowel terms, he does
occasionally describe individual letters or words with /e/ and /a/
by means of other participial forms. For example, in his twenty-
fourth chapter, he explains the inflection of *ʾetpʿel* verbs in the
imperative, saying:

ܗܘܐ ܝܕܥ ܕܟܠ ܡܠܬܐ ܕܡܬܩܪܝܐ ܠܥܠ ܡܬܟܬܒܢܝܬܐ . ܘܡܬܩܪܝܐ ܗܘܐ
ܘܩܪܝܬܐ ܕܝܠܗ ܡܢ ܡܬܟܬܒܐ ܠܥܠ ܡܬܩܪܐ ܟܕ ܐܝܟ ܡܬܩܪ ܐܬܟܬܪ
ܐܬܬܒܠ .. ܐܬܟ ܝܡܟ .. ܐܬܟ ܝܡܟ .. ܐܬܒܝܢ ܒ ܐܬܒܝܢ ܒ .. ܐܬܒܝܢ ܐܬܒܝܢ .. ܐܬܬܟܠ
ܐܬܬܟܠ .

> You should know that every verb which is 'compressed
> downward' (*metrabṣɔ ltaḥt*) in its reading in the indicative,
> in the imperative form it is changed to 'opening', like so:
> *ʾestmek, ʾestamk*; *ʾetghen, ʾetgahn*; *ʾetnṣeb, ʾetnaṣb*; *ʾetrken,
> ʾetrakn*; *ʾettkel, ʾettakl*. (Baethgen 1880, ܗܒ, lines 10–12)

Metrabṣɔ 'compressed' here is a passive participle that describes
a word with *rbɔṣɔ* (/e/), indicating the result of the relative 'com-
pression' required from the lips to produce /e/ compared to /a/.
Meanwhile, *ltaḥt* 'downwards' may indicate the position of the

sublinear dots that represent /e/, the relatively-fronted position of /e/ on the scale of vowels within the mouth, or even the direction of airflow during the articulation of fronted vowels (or all three).[35] As Elias explains, when *ʾetpʿel* verbs with this /e/ are made imperative, the vowel in the second syllable becomes /a/. He indicates this /a/ as the verb becoming *puttɔħɔ* 'opening'.

   Elias also has two nominalised terms for /o/, naming it both *massaqɔ* 'raised up' and *rwaħtɔ* 'broadening'. *Rwaħtɔ* corresponds to Elias of Nisibis' *rawiħutɔ*, indicating that the articulation of /o/ is relatively open in comparison to /u/, and may derive from the mnemonic device that Ḥunayn used to explain the difference between *maruħin* and *mrɔwħin*. On the other hand, Elias of Ṭirhan's use of *massaqɔ* for /o/ contrasts Elias of Nisibis, who applied that name to /e/. Nevertheless, both Eliases use this term within the context of a single *mater lectionis*, both following the older Syriac principle of relative backness. For Elias of Nisibis, /e/ was 'raised up'—that is, farther back—in comparison to /i/, the other vowel which a *mater lectionis yod* may represent. For Elias of Ṭirhan, /o/ is 'raised up'—again, relatively backed—in comparison to /u/, the second vowel that *waw* can represent. Elias of Ṭirhan's application of this name to a *u*-vowel, rather than an *i*-vowel, is probably due to an understanding of *massaqɔ* as a translation of the Arabic inflectional term *marfūʿ* 'raised up', which usually described words that ended with /u/. This usage would have been comparatively pragmatic for Elias of Ṭirhan, as

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[35] On directionality and airflow in vocalisation, see the discussion of Saadia Gaon's vowel names, below, present chapter, §3.3.

he designed the *Memrɔ Gramaṭiqɔyɔ* specifically for an Arabic-speaking audience.

Elias of Ṭirhan then refers to /u/ as *ḥbɔṣɔ* 'squeezing, pressing together', a term that again contradicts Elias of Nisibis, but also again shows how the two Eliases' systems are logically consistent. For Elias of Ṭirhan, this term indicates the phonetic action of articulating /u/, which requires the lips to be pressed together. In this context, *ḥbɔṣɔ* is a clear calque of *ḍamma* 'pressing together', the Arabic name for the same vowel (compare Versteegh 1993, 30). It is also a relative term in Syriac, describing /u/ as relatively closed in comparison to /o/, the other vowel marked by *waw*.[36] In the same way, when Elias of Nisibis said that a *yod* was *ḥbiṣɔ*, he meant that it represented /i/, relatively-closed in comparison to /e/.

We see here a mixture of multiple phonological concepts in the Eliases' terminology for /e/, /i/, /o/, and /u/. It seems that Elias of Ṭirhan calqued the Arabic terms *ḍamma* 'pressing together' and *marfūʿ* 'raised up', both of which indicated /u/ in Arabic, as *ḥbɔṣɔ* and *massaqɔ*. He applied *ḥbɔṣɔ* to the equivalent Syriac vowel, /u/. Then, in a process akin to the likely adoption of *zqɔpɔ* as a calque of *naṣb* (above, present chapter, §2.1), he applied a new Syriac vowel name (*massaqɔ*) based on an Arabic inflectional name (*marfūʿ*) for Syriac's secondary *u*-vowel, /o/ (which did not exist phonemically in Classical Arabic). This adaptation of Arabic terminology supplemented the name *rwaḥtɔ*

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[36] Recall, however, that Dawid bar Pawlos used *ḥbiṣɔ* to describe *yod* representing /i/ (see above, chapter 3, §1.1). *Ḥbɔṣɔ* was also Bar Hebraeus' term for /i/.

'broadening' (/o/), which Elias likely already knew from the tra-
dition of Ḥunayn ibn Isḥāq, and served the practical purpose of
making his Syriac grammar more palatable to Arabic-speaking
readers. Elias of Nisibis, on the other hand, seems to have been
more concerned with ensuring that East Syriac had a larger vowel
inventory than Arabic and West Syriac. In service of this goal, he
needed seven discrete terms, and could not afford to apply mul-
tiple names to the same vowel. Since he likely already had *rwiḥɔ*
'broadened' (/o/) and *ʾalisɔ* 'narrowed' (/u/) from the tradition
of Ḥunayn's mnemonic device, he applied *massaqɔ* and *ḥbiṣɔ* to
/e/ and /i/, respectively, using the fundamental Syriac principles
of relative height and openness.

The two Eliases do not represent the culmination of vowel
naming in the Syriac phonological tradition, but their grammars
do mark the first time that Syriac linguists had complete sets of
terms that could name every Syriac vowel on an absolute basis.
These absolute sets developed organically during the ninth and
tenth centuries, as translators and lexicographers adopted new
terminology based on the relative 'wide-and-narrow' compari-
sons of the first Syriac grammarians. The earliest sources for such
terms are Dawid bar Pawlos' (fl. 770–800) *scholion* on *bgdkt* let-
ters and Ḥunayn ibn Isḥāq's (d. 873) version of *Ktɔbɔ d-Shmɔhe
Dɔmyɔye*, which describe /a/ using participles from the root *ptḥ*
'opening'. They contain similar descriptions for /ɔ/, using parti-
ciples of the root *zqp* 'standing upright', and most likely calquing
Arabic *naṣb* 'standing upright' (/a/, /ɑ/). Shortly after Ḥunayn,
the lexicographers Ibn ʿAlī and Bar Bahlul included additional
'wide-and-narrow' participles in their dictionaries, including *rbiṣɔ*

'compressed' (/e/), *zribɔ* 'contracted, constrained' (also /e/), and possibly *ḥbiṣɔ* 'pressed together' (/i/). The eleventh-century Eliases then supplemented these terms with even more 'wide-and-narrow' descriptors, taking forms of *rwḥ* 'broadening' (/o/) and *ʾlṣ* 'narrowing' (/u/). They also calqued terms from Arabic grammar, yielding *massaqɔ* 'raised up' (/o/ or /e/) and *ḥbɔṣɔ* 'pressing together' (/i/ or /u/).

Syriac vowel terminology continued to evolve after the Eliases, eventually reaching the forms found in modern grammars. Notably, *ʿṣɔṣɔ* 'constraining' only occurs in Dawid bar Pawlos' *scholion* (as the participle *ʿṣiṣɔ*) and the marginal notes of BL Add. 12138, with no trace of it among Ḥunayn, the lexicographers, or the Eliases, even though it appears for /u/ in Bar Hebraeus' (d. 1286) grammar. There is also hardly any sign in our sources of *zlɔmɔ* 'inclining', which occurs as a name for /e/ in Ishoʿyahb bar Malkon's (fl. c. 1200) *Mṣidtɔ d-Nuqze* (*The Net of Points*) (Merx 1889, 113; Talmon 1996, 291; Van Rompay 2011).[37] Moreover, none of the aforementioned authors have systematic terminology to indicate vowel length, even though such terms eventually appear in Bar Hebraeus' vowel system (Merx 1889, 50; Versteegh 1993, 29–30). These developments require more careful analysis in the context of twelfth- and thirteenth-century Arabic and Hebrew linguistic sources, but such a study is beyond the scope of this book. Instead, we now turn back to the Hebrew tradition, and examine how it evolved alongside Syriac between the time

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[37] Bar Malkon also refers to /u/ as *rbɔṣɔ*, applying yet another interpretation of 'compressing' to the relatively-closed vowel belonging to the *mater lectionis waw* (Merx, *Historia*, 113).

of its earliest relative vowel terminology and its first sets of ab-
solute names.

3.0. Vowel Names in the Hebrew Tradition[38]

Like in the Syriac grammatical tradition, the first Masoretic
vowel names emerged from the comparative context of 'open-
and-closed' comparisons, with the early relative terms *pɔtaḥ* and
qɔmeṣ eventually stabilising as terms for specific vowels (namely
/a/ and /ɔ/) (see Khan 2020, I:245). However, also like in Syriac,
this type of comparison did not become the universal principle
for defining Hebrew vowels. Masoretes and grammarians re-
ferred to the Tiberian vowels /ɛ/, /e/, /i/, /o/, and /u/ by many
different names between the ninth and eleventh centuries, in-
cluding: modifications to the relative terminology; the number,
shape, and position of the vowel points; descriptions of the mouth
during articulation; and the addition of Arabic grammatical
terms to Masoretic vocabulary. Taking note of these different
terms, Israel Yeivin (1983, 80) has suggested that the variation
is the result of different 'schools' of linguistic thought that main-
tained different naming conventions, all in use at roughly the
same time (Dotan 2007, 634). Each of these conventions has its
roots in the relative naming of *pɔtaḥ* and *qɔmeṣ,* but different au-
thors supplemented these names with additional descriptions of

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[38] Some passages in this section were previously published in Posegay
(2021a). They appear here re-edited with expanded discussion.

graphemes, phonetic terminology, and names from Arabic grammar.[39]

The expanded usage of the relative terms as vowel names is evident in a few anonymous Masoretic treatises, as well as in Aharon ben Asher's (d. c. 960) *Diqduqe ha-Ṭeʿamim* (*The Fine Details of the Accents*) and Judah ben David Ḥayyūj's (d. c. 1000) early work *Kitāb al-Tanqīṭ* (*The Book of Pointing*). Some of this usage appears in the *Treatise on the Shewa* and other *muṣawwitāt* texts, but those sources also count the number of dots in each vowel sign or utilise Arabic phonetic terminology. The earliest datable text that approximates the 'modern' vowel names *ḥolem* (/o/), *shuruq* (/u/), *ṣere* (/e/), and *ḥiriq* (/i/) is Saadia Gaon's (d. 942) Hebrew grammar, *Kutub al-Lugha* (*The Books of the Language*), but it is not certain how he vocalised those names. A number of undated fragments from the Cairo Genizah imply that they were initially segolate nouns in Hebrew, and two *muṣawwitāt* texts cite clear Aramaic forms for each vowel, suggesting that the terms predate Saadia. Ḥayyūj also mentions Saadia's vowel names in his book on Hebrew verb forms, *Kitāb al-Afʿal Dhuwāt Ḥurūf al-Līn* (*The Book of Verbs with Soft Letters*), but he generally prefers Arabic vowel names over Hebrew ones. Whatever their source, these 'modern' names did not immediately take hold in the Hebrew tradition, and certain scholars continued identifying vowels by other methods even into the eleventh century.

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[39] Brief treatments of the vowel names appear in Gesenius (1910), Haupt (1901), Dotan (2007), and Khan (2020, I:245–46, 256–65).

3.1. Expanding the Relative System

In his exploration of early Hebrew relative vowel phonology (see above, chapter 3, §1.2), Steiner identifies several Masoretic vowel lists which contain names from the roots *ptḥ* 'opening' and *qmṣ* 'closing', but do not have phonetic terms for the other Hebrew vowels. This convention is found in a number of other Masoretic texts, including Aharon ben Asher's tenth-century *Diqduqe ha-Ṭeʿamim* (*The Fine Details of the Accents*) and some of the additional notes published in Baer and Strack's book of the same name, *Dikduke ha-Ṭeʿamim* (1879).

It is worth pausing here to reiterate the relationship between these two books. Aharon ben Asher wrote his *Diqduqe ha-Ṭeʿamim* in the first half of the tenth century as a guide to the rules of the Tiberian Hebrew accent system. The text is mainly in rhymed Hebrew prose, and from time to time it describes Hebrew vocalisation in addition to cantillation marks. In 1879, Baer and Strack published the first edition of Ben Asher's book along with many shorter Masoretic texts in the second part of the same volume. However, the version of *Diqduqe ha-Ṭeʿamim* that they compiled contained a number of sections that were not part of Ben Asher's original work. Dotan (1967) identified these sections and published a new edition of *Diqduqe ha-Ṭeʿamim* based only on Ben Asher's writings. As such, some passages which appear to be part of *Diqduqe ha-Ṭeʿamim* in Baer and Strack's volume—and are cited under that title—are in fact from other Masoretic works.

Returning to the vowel names, Steiner (2005, 378–79) finds three Masoretic vowel lists that use just *ptḥ* and *qmṣ* in their phonetic descriptions. Each list applies these terms to /a/ and

/ɔ/, and then uses other methods to define the other five vowels. The first is a passage from Baer and Strack's *Dikduke ha-Teʿamim* (1879, 11, lines 23–28; Steiner 2005, 378). After /a/ and /ɔ/, it calls /ɛ/ and /e/ *pɔtḥɔ qtannɔ* 'small opening' and *qɔmṣɔ qtannɔ* 'small closing', respectively, indicating that /ɛ/ is relatively open in comparison to /e/. Steiner (2005, 379) takes the lack of vowel names derived from phonetic descriptions, besides *ptḥ* and *qmṣ*, as a remnant of the earlier relative phase in which those two terms alone could refer to any vowel, preserved now in the transition towards absolute vowel names. That is, /a/ became *pɔtaḥ* 'opening' because it was once considered more open in relation to /ɔ/, which accordingly was more *qɔmeṣ* 'closing'. In fact, the author of this passage even describes *qɔmṣɔ* by saying: "first is *qɔmṣɔ*, with mouth gathered together (ראשונה היא קָמְצָה בפה היא קבוצה)." They use the word *qbuṣɔ* 'gathered, pressed together', which would eventually come to mean /u/ due to the compression of the lips (see below, present chapter, §3.4).

What Steiner does not notice is that *qtannɔ* 'small' is also a phonetic term in this context. It indicates that /ɛ/ and /e/ are relatively closed in comparison to /a/ and /ɔ/, their parallel pair of 'open-and-closed' vowels. This description is precisely the same as what we might expect from Jacob of Edessa (d. 708), who considered /e/ *qaṭṭin* 'narrow' relative to the more *pte* 'wide' /ɔ/ and /a/.[40] This secondary relative relationship strengthens

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[40] Recall that Jacob pronounced an unrounded /ɑ/ as his reflex of the later Syriac and Tiberian /ɔ/, and thus he classified it as 'wider' (more-open) than /a/.

Steiner's argument that these terms are a remnant of the earlier
relative stage of Masoretic phonology.

   The second vowel list is also from one of Baer and Strack's
additional notes, with the heading *Nequdot Omeṣ ha-Miqrɔ* (*The
Dots of the Greatness of the Scripture*) (1879, §36, 34, lines 5–9). It
spells out most of the vowels with *matres lectionis* (i.e., *ʾey*, *ʾow*,
ʾiy, *ʾuw*), and Dotan (2007, 634) argues that such phonetic spell-
ings are among the earliest methods for naming vowels, most
likely predating the vocalisation signs themselves. However, the
list also includes the terms *pɔtḥɔ* and *qɔmṣɔ*, which Steiner again
takes as evidence that these two preserve the phonological fea-
tures of an earlier stage. This note also shows how late that 'early'
stage remained influential in Masoretic vocalisation, as it was
found in the Masoretic material of the Leningrad Codex, com-
pleted in 1008, and the subsequent section contains a vowel scale
that appears to be divided using calques of Arabic grammatical
terminology (see below, present chapter, §3.4 and Eldar 1983,
43). Steiner's (2005, 379, n. 51) third list is from the text known
as *Reshimat Munnaḥim* (*List of Terms*) (see also, Allony 1986, 123;
above, chapter 2, §3.3). In addition to two names from *ptḥ* and
qmṣ, it associates each of the Hebrew vowels with one of the *ma-
tres lectionis*: *ʾaleph*, *waw*, and *yod*. Again, Steiner takes the two
phonetic terms as evidence of the relative system that predates
the other vowel names.

   Ben Asher's *Diqduqe ha-Ṭeʿamim* uses this same vowel clas-
sification system, with only two main phonetic terms that are de-
rived from *ptḥ* and *qmṣ*. Ben Asher consistently refers to the vowel
/a/ with *pɔtaḥ* and *pɔtḥɔ* (Dotan 1967, 131, line 5, 133, lines 1–

2, 144, line 1), and he describes the Tiberian vocalic *shewa* using the same root (Dotan 1967, 140, lines 2–3, 141, line 1), including with the verbal form *yiṗtaḥ* 'one would open' (Dotan 1967, 115, lines 3–5). Similarly, he indicates /ɔ/ with *qɔmeṣ* and *qɔmṣɔ* (Dotan 1967, 119, lines 2–3, 138, line 2), as well as the passive participle *qɔmuṣ* (Dotan 1967, 144–45, lines 2–3). He is also familiar with the secondary relative usage, using *qɔmeṣ qɔṭon* 'small *qameṣ*' for /e/ (Dotan 1967, 137, line 2). As Steiner (2005, 379) emphasises, Ben Asher does not use any of these words as relative terms. Instead, each defines a specific vowel quality, showing remnants of relative vocalisation fossilised in the absolute system.

Judah ben David Ḥayyūj (d. c. 1000) also makes use of the expanded relative naming in his early work, *Kitāb al-Tanqīṭ* (*The Book of Pointing*) (Nutt 1870, I–XV). While this text is mostly in Arabic, Ḥayyūj uses the Hebrew terms *qɔmeṣ gadol* 'large *qameṣ*' and *pɔtaḥ gadol* 'large *pataḥ*' for /ɔ/ and /a/, respectively (Nutt 1870, I, lines 5–7 and III, lines 5–6, lines 12–14), and likewise applies *qɔmeṣ qɔton* and *pɔtaḥ qɔton* to /e/ and /ɛ/ (Nutt 1870, VIII, lines 14–22, X, lines 19–21, and XI, lines 6–10). This contrast of 'big' and 'small' vowels may also be connected to similar descriptions of *matres lectionis* found in the work of Ḥayyūj's Arabic contemporaries, Ibn Jinnī (d. 1002) and Ibn Sīnā (d. 1037), and ultimately related to Greek phonetics (see above, chapter 2, §3.3). Notably, however, Ḥayyūj abandons this system for his later works on irregular verbs, *Kitāb al-Afʿal Dhuwāt Ḥurūf al-Līn* (*The Book of Verbs Which Have Soft Letters*) and *al-Qawl fī al-Afʿāl Dhuwāt al-Mathalayn* (*The Discourse on Verbs Which Have Two of*

the Same) (Jastrow 1897, 220). In those texts, even though he expresses knowledge of other Hebrew vowel names, he prefers names from the Arabic grammatical tradition (e.g., *fatḥa*, *kasra*, *ḍamma*) to describe Hebrew phonology. The same expanded relative names also appear in T-S Ar.5.57, a Judaeo-Arabic fragment of a Hebrew grammatical text from the Cairo Genizah. It (T-S Ar.5.57 f. 1v, lines 5–6) discusses how certain forms of the root *ʾkl* have *qɔmeṣ qɔton* (/e/) or *qɔmeṣ gadol* (/ɔ/).

3.2. Graphemic Vowel Names

Hebrew scribes seem to have first supplemented the *ptḥ* and *qmṣ* vowel names by counting the dots in the Tiberian vowel signs. As such, they often called /i/ (אִ) and /o/ (אֹ) 'one dot', /e/ (אֵ) 'two dots', and /ɛ/ (אֶ) and /u/ (אֻ) 'three dots'. These names were still insufficient to name all the vowels absolutely, so some Masoretes—most notably the *Treatise on the Shewa*'s author—applied additional descriptors related to the position, location, and shape of the signs.

Ben Asher refers to several vowels according to numbers of dots in *Diqduqe ha-Ṭeʿamim*. When comparing different ways that one can vocalise כל (*kol* or *kɔl*), he writes: "But if it is cut off, not combined with its neighbour, it is free of *qɔmṣɔ*, and one dot is required (ואם הוא חתוך עם שכנו לא פתוך, מקמצה הוא רש ונקודה אחת נדרש)" (Dotan 1967, 119, lines 2–3). Similarly, he explains that the suffix -*hem* "is *qɔmeṣ qɔton* in every case, with two dots (הֶם בכל מקום קמץ קטן בשתי נקודות)," except in the context of a few letters, "which occur with three dots [/ɛ/] (בשלש נקודות מצויות)" (Dotan 1967, 137, lines 1–2). In stating that 'two dots' (*shte nequdot*)

accompany the *qɔmeṣ qɔton* (/e/) in *-hem*, but also that *-hɛm* oc-
curs with 'three dots' (*shɔlosh nequdot*), Ben Asher links the vowel
points to the relative phonology of the term *qɔmeṣ*. This mixture
of terms is interesting, as it does not presuppose that the reader
already associates the *qɔmeṣ qɔton* with 'two dots'. This may in
turn imply that referring to a vowel by the number of its dots was
a recent development in Ben Asher's time. In any case, he is
aware of some convention that indicates /o/, /e/, and /ɛ/ accord-
ing to the form of their Tiberian graphemes.

  The descriptions of vowel points in two of Steiner's vowel
lists reflect terminology similar to Ben Asher's numeration. The
first refers to /e/ as *qɔmṣɔ qtannɔ*, but clarifies that it occurs with
shte nequdot. It then identifies /o/ as "one dot, placed all alone
(נקֻדה אחת לבאד מונחת)," and /u/ as "the *ʾu* of the middle (או
האמצעית)" (Baer and Strack 1879, 11, lines 23–28), referring to
the intralinear position of the Tiberian vowel point. This last de-
scription incorporates the location of a point as an identifying
feature of a vowel phoneme, a concept which is more fully devel-
oped in *The Treatise on the Shewa* (see below). Steiner's second
list calls /ɛ/ *shɔlosh nequdot* 'three dots', but otherwise applies no
numbering conventions (Baer and Strack 1879, 36, lines 2–6).

  Numerical vowel names also appear frequently in linguistic
texts from the Cairo Genizah, though the precise age of these ref-
erences is difficult to determine. For example, T-S NS 301.37, a
fragment of a Judaeo-Arabic Karaite grammatical text, explains
the vocalisation of verbs that contain *al-nuqṭatayn* 'the two dots'
(T-S NS 301.37, recto line 10 and verso line 13). It also still vo-
calises *ptḥ* as an Aramaic active participle, *pɔtaḥ* (פָּתַח) (T-S NS

301.37, verso line 2), which may suggest that it is relatively old. T-S NS 301.48, another fragment of a grammatical text, refers to /e/ and /ɛ/ as *al-nuqṭatayn* 'the two' and *al-thalātha* 'the three', respectively. It includes Arabic plural forms of *pɔtaḥ* and *qɔmeṣ*: *al-pātiḥāt* and *al-qāmiṣāt* (T-S NS 301.48, f. 2 recto, line 24–25). Although Arabic forms, these too are active participles, perhaps translated from an earlier Aramaic source, and again may point to a relatively early date. Unfortunately, the fragment is too badly rubbed to decipher the rest of the text. Additionally, T-S Ar.5.8 refers to *ptḥ mukhaffaf* 'lightened opening' and *nuqṭatayn* for /a/ and /e/ (T-S Ar.5.8, f. 1 verso, lines 4–5). This fragment is vellum, has frequent *plene* spellings for Judaeo-Arabic words (though not for the definite article with sun letters), and is in a horizontal book format, all of which point to an early date (c. tenth century).[41]

Naming vowels according to the graphemic appearance of points was clearly not rare in the medieval Hebrew linguistic tradition, but the *Treatise on the Shewa* shows an especially developed application of this convention. Likely from the tenth century (Khan 2020, I:117–18), this text is a portion of a larger Masoretic treatise on Hebrew accents and vocalisation. It may be considered another *muṣawwitāt* text, and it refers to the category of the seven Hebrew vowels using that term (Levy 1936, א; see above, chapter 2, §1.2). The extant portion is a chapter on the

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[41] On Judaeo-Arabic orthography, see Blau and Hopkins (1984) and Khan (2018). On horizontal vs. vertical format in Islamicate codicology, see Déroche (1992, 17–18), James (1992, 14), and Gruendler (2001, 142).

shewa—hence the modern title—which describes the various phonetic situations in which *shewa* can occur. The anonymous author writes mainly in Judaeo-Arabic, but they often switch into partially-rhymed Hebrew prose, including for some descriptions of the format of the treatise itself and the history of earlier Masoretes (Levy 1936, ה, line 3, ט, line 5, to י, line 9). This inconsistency suggests that the author drew on ninth-century Hebrew sources when writing the *Treatise*. The language variation also grants insight into the author's terms for vowels, as they provide their own Arabic translations for Hebrew terms that describe the appearance of vocalisation points.

Like most Hebrew scholars, the author of this text retains the roots of the old relative terms *ptḥ* and *qmṣ* and uses them to indicate /a/ and /ɔ/ (Levy 1936, י, line 10). For example, they say for *shewa*, "at the beginning of words, it is always *mutaḥarrik*, and its vocalisation and pronunciation are with *fātiḥa* 'opening' (פי אול אלתבות והו אבדא מתחרך ותחריכה וכרוגה יכון בפאתח)" (Levy 1936, ח, lines 2–3). Then, after a string of examples of words with vocalic *shewa*, the text reads, "all of them are opened in the recitation with *ptḥ* (גמיעהם ינפתחוא פי אלקראה בפתח)" (Levy 1936, ח, lines 4–5). These constructions are used practically interchangeably throughout the text to indicate that a vocalic *shewa* is pronounced as /a/, sometimes saying that its vocalisation is "with *ptḥ*" and other times "with *fātiḥa*" or "with *fatḥa* (פתחה)" (Levy 1936, ד, lines 12–13, יד, lines 13–14). However, in general, it

seems that *ptḥ*[42] is the author's name for the vocalisation sign it-
self, because they refer several times to 'the vowel of *pataḥ*'
(*ḥaraka ptḥ*) or 'the vowel of *qameṣ*' (*ḥaraka qmṣ*)" (Levy 1936, ג,
lines 18–19, and כא, line 8). Moreover, they say that for a partic-
ular ʾaleph that has a *ḥaṭef pataḥ*[43] sign (אֲ), "beneath the ʾaleph is
shewa and *ptḥ* (ותחת אלאלף שוא ופתח)" (Levy 1936, יב, lines 2–3),
suggesting that the *ptḥ* is the sublinear horizontal stroke itself. By
contrast, the Arabic forms *fātiḥa*, *fatḥa*, and *maftūḥ* 'opened' are
taken directly from the Arabic verb *fataḥa* 'to open' (Levy 1936,
יח, line 5, טו, line 5), which indicates the phonological process
that a *shewa* undergoes to acquire vocalic status. This usage
matches the way that Arabic grammarians describe the addition
of /a/ to a consonant (see above, chapter 2, §2.2), despite *shewa*
not being a full letter.

As for the Tiberian *e*-vowels, the *Treatise on the Shewa* only
uses terms based on the number of dots for /e/ and /ɛ/. The au-
thor lists them alongside *ptḥ* and *qmṣ* with the Judaeo-Arabic
forms *thnatayn* 'two' (Levy 1936, כא, line 8) and *al-thalātha* 'the
three' (Levy 1936, י, lines 10–11), and in another section as *thna-
tayn nuqaṭ* 'two dots' and *thalātha nuqaṭ* 'three dots' (Levy 1936,
יח, line 14, and כ, lines 19–20). The author also denotes /e/ with
the Arabic dual form *al-nuqṭatayn* 'the two dots' (Levy 1936, כ,
line 20). Similarly, the text describes what is now known as *ḥaṭef*

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[42] Likely vocalised like the Aramaic active participle *pɔtaḥ*, but the text
only gives the consonants.

[43] The text does not use this precise term, although it does use the *ḥṭp*
root in several instances to describe shortened vowels. See Levy (1936,
יז and כה, lines 5–6).

segol with the phrase *al-thalātha shewa* 'the three-*shewa*(?)', using their name for /ɛ/ as an attribute of a vocalic *shewa*. Finally, in another instance where the author shows the differences in their various source materials, they explain how to pronounce *shewa* in forms of the Hebrew verb *ʾɔḵal*. Beginning in Hebrew, they write, "every variant of *ʾɔḵila*, if it is with *shɔlosh nequdot*… (כל נקודות בשלושה אם אכילה לשון)" (Levy 1936, ל, line 8), and then explain the effect of /ɛ/ on *shewa*. They then continue, now in Arabic: "but if *nuqṭayn*[44] is after the *shewa*… (ואד̇א כאן בעד אלשוא נקטין)" (Levy 1936, ל, lines 10–11), before explaining the impact of /e/ on *shewa*. It seems that the author is either combining passages from separate Hebrew and Arabic works or composing additional Arabic sentences to expand an earlier Hebrew text. As a result, the Arabic term *nuqṭayn* 'two dots' appears here beside the Hebrew *shɔlosh nequdot* 'three dots', even though the author has already used a Hebrew term for 'two dots'—*shte nequdot*—earlier in the text (Levy 1936, יʼ, line 10).

    None of these terms for *e*-vowels vary substantially from those in *Diqduqe ha-Ṭeʿamim* or other Masoretic texts that also count dots, but the *Treatise on the Shewa* distinguishes itself by implementing additional names based on the location of the dots. When indicating /o/, the text reads: "as for the symbol of the upper one, I mean, the upper dot (ואמא סימן העליוני אעני אלנקטה אלפוקא)" (Levy 1936, יז, line 15). The author uses the Hebrew phrase *siman ha-ʿelyoni* 'the symbol of the upper one', applying a nominal form related to the Hebrew preposition *ʿal* 'over, above'

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[44] This spelling might be a mistake for *nuqṭatayn* 'two dots', but it could also be an intentional dual form of *naqṭ* 'pointing'.

(see Dotan 2007, 634; Khan 2020, I:263). They translate this term with the Arabic phrase *al-nuqṭa al-fawqā* 'the upper dot', using a nominalised form of the Arabic preposition *fawqa* 'over, above'. Then for /i/, they write, "as for the lowered symbol (פאמא אלסימן אלתחתוני)" (Levy 1936, י, lines 1–2), again using a noun (*al-taḥtoni* 'the lowered one') formed from a Hebrew preposition (*taḥat* 'under, below'), although this time prefixing it with the Arabic (rather than Hebrew) definite article. Later, they give additional Arabic calques of the Hebrew terms, referring to *al-siman al-fawqānī* 'the upper symbol' and *al-saflānī* 'the lower [symbol]' (Levy 1936, טי, line 1). In all of these cases, the word *siman* 'symbol' suggests that these locative terms are names for the dots themselves. Nevertheless, a deliberate association of 'upperness' and 'lowerness' with the vowels /o/ and /i/, respectively, is precisely the type of description that would be expected in a graphical system that evolved from a relative system that connected phonetic backness to a height-based scale (see above, chapter 3, §1.3).

   In addition to the 'above' and 'below' terms, the text sometimes refers to /i/ and /o/ by simply counting their dots, just as for /e/ and /ɛ/. For example, the author indicates /i/ by saying that a word is read with *nuqṭa wāḥida* 'one dot' (Levy 1936, טי, lines 14–15), trusting that the reader can tell from context that they mean a dot below (/i/) rather than a dot above (/o/). Additionally, when listing the vowels that have reduced forms (i.e., *ḥaṭef* vowels), the author explains that they are only "*ptḥ, qmṣ,* and *al-thalātha nuqaṭ,* but not *al-nuqṭatayn,* or one *min fawqa* or *min ʾasfal*" (Levy 1936, כ, lines 18–21). That is, *shewa* can reduce

/a/, /ɔ/, and /ɛ/, but not /e/, /o/, or /i/. These last two are
called 'one above' (*wāḥid min fawqa*) and 'below' (*min ʾasfal*), re-
spectively, paralleling the construction of *milleʿel* 'above' and *mil-
leraʿ* 'below' found in earlier Masoretic sources.

Lastly, the *Treatise on the Shewa* includes multiple ways to
indicate the vowel /u/, which is unique in the Tiberian pointing
system in that it has two different graphemes: one dot within a
mater lectionis waw (וּ) or three oblique dots below a consonant
(אֻ). The author accounts for this fact at the end of one of their
vowel lists, describing /u/ as "the three which are pronounced
with ʾu, which they call *al-zujj* (אלתלתה אלתי תכרג באו אלדֿין יסמונהא
אלזֿג)" (Levy 1936, יט, lines 1–2). 'The three' here refers to the
three sublinear dots of the second sign for /u/, but the author
explains the phonetic quality of this sign by spelling out the
sound, using a *waw* with a single dot (או). As for *zujj*, in Classical
Arabic, it refers to a physical 'tip' or 'point', usually of something
that pierces, like an arrow or spear (Kazimirski 1860, 973; Lane
1863, 1215). *Al-zujj* thus describes the 'piercing' of a *wāw* by the
intralinear dot that represents /u/. This name also occurs in two
eleventh-century Karaite texts, namely *Hidāya al-Qārī* (*The Guide
for the Reader*) by Abū al-Faraj Hārūn and the anonymous *Kitāb
al-ʿUqūd fī Taṣārīf al-Lugha al-ʿIbrāniyya* (*The Book of Rules Con-
cerning the Grammatical Inflections of the Hebrew Language*) (Vidro
2013, 2–3, 395; Khan 2020, II:17). Besides *zujj*, the *Treatise on
the Shewa* still identifies /u/ by counting the dot in a *mater lec-
tionis waw*. For example, they instruct that if a *waw* with a *shewa*
precedes *bet, mem*, or *peʾ*, then "never point with a *shewa*, but
rather with one dot (לא תנקט בשוא לעולם בל בנקטה ואחדה)" (Levy

1936, כו, lines 16–17). Likewise, those same *waws* are "pointed
and recited with a dot in the heart of the *waw* (ינקט ויקרא בנקטה
בגוף אלואו)" (Levy 1936, כז, lines 17–18).

To summarise, the *Treatise on the Shewa* follows the basic
Hebrew vowel naming conventions inherited from the early rel-
ative vocalisation system, and also uses one of the most devel-
oped sets of Masoretic vowel names based on graphemic descrip-
tions. Like most Hebrew linguists, the author refers to /a/ and
/ɔ/ using the older relative terms from the roots *ptḥ* 'opening' and
qmṣ 'closing'. Like *Diqduqe ha-Ṭeʿamim*, T-S NS 301.37, and T-S
NS 301.48, they supplement these two names by counting dots.
The result is vowel numerical terminology in both Hebrew (*shte
nedudot, shɔlosh nequdot*) and Arabic (*al-nuqṭatayn, thnatayn
nuqaṭ, al-thalātha, thalātha nuqaṭ*) for the vowels /e/ and /ɛ/. Ac-
cordingly, the author calls both /o/ and /i/ *nuqṭa waḥida*, assum-
ing that the reader can differentiate them from context, but also
gives them names related to their position, again in both Hebrew
(*ha-ʿelyoni, al-taḥtoni*) and Arabic (*al-nuqṭa al-fawqā, al-fawqānī,
al-saflānī*). Finally, /u/ is both *nuqṭa wāḥida* (וֹ) and *al-thalātha*
(אֻ), depending on its grapheme, and also takes the Arabic name
al-ẓujj 'piercing', referring to the physical form of a single dot
within a *mater lectionis waw*.

Many Hebrew linguists continued using vowel terms based
on the physical appearance of graphemes, even into the eleventh
century (Khan 2000, 24; Dotan 2007, 634). However, while Ben
Asher was writing about *qɔmeṣ qɔṭon* and 'the two dots', other
scholars were implementing vowel names as phonetic descrip-
tions of articulation.

3.3. Phonetic Vowel Names

The 'modern' Hebrew vowel names are almost all phonetic names, derived from the descriptions of articulatory actions that produce them, but they did not all develop from the same source. Like the expanded relative system and the naming conventions based on graphemes, the phonetic names for /a/ and /ɔ/ remained *pataḥ* 'opening' and *qameṣ* 'closing', or minor variations thereof. At some early stage (c. ninth century), Masoretes assigned the remaining vowels Aramaic names based on the roots *ḥlm* 'closing firmly' (/o/), *ṣry* 'crack, rift, splitting' (/e/), *ḥrq* (/i/) 'gnashing, grinding the teeth', and *shrq* 'whistling' (/u/), each corresponding to physical motions involved in articulation. The main exception to this convention is the term for /ɛ/, which goes by the name *segol* 'a bunch of grapes' in most phonetic vowel lists, probably based on an analogy with the accent sign of the same name and shape (*segoltɔ*: אֱ) (see Dotan 2007, 637).

The earliest dated list of phonetic vowel names comes from the fifth chapter of Saadia Gaon's *Kutub al-Lugha* (*The Books of the Language*), titled *al-Qawl fī al-Nagham* (*The Discourse on Melody*), which he wrote sometime between 913 and 931 (Lambert 1891, 76, n. 1 [French]; Malter 1921, 44, n. 57).[45] This chapter is thus one of the earliest explanations of Hebrew vowel phonology that goes beyond basic instructions for recitation. In the text, Saadia places the Hebrew vowels on a vertical scale that follows the phonetic hierarchy of the *milleʿel* and *milleraʿ* homograph

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[45] Saadia completed his earliest work, the poetic dictionary *Agron*, when he was twenty years old in 913. He completed his *Commentary of Sefer Yeṣira*, which cites *Kutub al-Lugha*, in 931. See Brody (2016, 79).

comparisons, judging those which are pronounced farther back in the mouth to be 'higher' than those pronounced near the front (see above, chapter 3, §§1.2–3). He explains how the vowels are arranged according to the place at which one interrupts their air-flow, writing:

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 אלחלם וקותה
סאלכה אמאמה גיר חאידה אלי פוק ולא אלי אספל ואן שא אן יתגאוז
בהא הדא אלמוצע תם יפצלהא טהרת קוה אלקמץ וכאנת חרכתה אלי
אעלי אלחנך כאצה

As with the explanation of the third chapter, which was the knowledge of the places in the mouth, and their levels, we say then: if someone chose to interrupt their melody at the first point, they could cut it off after its ascension from the throat; then *al-ḥlm* would appear, with its force proceeding ahead of it, not wavering upwards or downwards. But if one wanted to take [the melody] past this point, then they would interrupt it, the force of *al-qmṣ* would appear, and its movement is specifically towards the top of the palate. (Skoss 1952, 292, lines 7–13)

This passage shows the extent to which Saadia was familiar with the Arabic grammatical tradition, as his progression through the 'points' (*mawāḍiʿ*) and 'levels' (*marātib*) of the mouth mirrors the language of al-Khalīl ibn Aḥmad (d. 786/91) and Sībawayh (d. 793/6) in their rankings of the Arabic articulation points in *Kitāb al-ʿAyn* and *Kitāb Sībawayh*. Also note the similarity between Saadia's description of /ɔ/ and Sībawayh's description of the allophones of ʾalif following *mustaʿliya* letters (i.e., /ɑ/, /ɔ/) (Sībawayh 1986, IV:129; see above, chapter 3, §2.2). On the

other hand, while the precise definition of 'force' (*quwwa*) in this text is not entirely clear, it seems to refer to the stream of air that emits during the articulation of a vowel. Saadia applies it to explain the ways in which one can manipulate the direction of airflow to produce different phonemes. This meaning of *quwwa* differs from that found in *Kitāb Sībawayh*, where the word instead indicates the 'strength' of phonological elements (al-Nassir 1993, 121).

More importantly for our current discussion, this passage also explains how *ḥlm* (/o/) and *qmṣ* (/ɔ/) are 'cut off' (*faṣala*; *qaṭaʿa*) as the first two vowels on the Hebrew scale. That is, they are articulated farthest back in the mouth, with *ḥlm* occurring as close as possible to the throat, and *qmṣ* occurring just ahead of it at 'the top of the palate' (*ʾaʿlā al-ḥanak*). Moreover, while the 'force' (*quwwa*) of the *qmṣ* requires some 'movement' (*ḥaraka*) up towards the palate, the *quwwa* of *ḥlm* does not turn 'upwards' (*ʾilā fawq*) or 'downwards' (*ʾilā ʾasfal*) at all. This perception of /o/ as 'unwavering' (*ghayr ḥāʾida*) is unique to the Hebrew linguistic tradition, and does not occur in phonological descriptions of Syriac or Arabic vowels. It also shows that the direction of airflow during articulation was a significant phonetic feature for Saadia, and he uses that feature throughout this section to differentiate vowels.

It is sometimes difficult to determine how exactly Saadia, or indeed any medieval Hebrew grammarian, would have pronounced their vowel terms. While most of the names in this text appear to have Hebrew forms, *qmṣ* was probably still pronounced

close to the older Aramaic participial form *qɔmeṣ* 'closing'. How-
ever, Saadia also refers to /ɔ/ as *qamṣa* (קמצה) (Skoss 1952, 296,
line 17, and 314, line 1),[46] possibly on analogy with the pattern
of the Arabic vowel names (*fatḥa, kasra, ḍamma*). As for *ḥlm*, it
was not until the eleventh century that Hebrew grammarians be-
gan adding 'symbolic' vowels to the first syllable of vowel names
to match the phonetic qualities which those names denoted (i.e.,
ḥolem, shuruq, pataḥ, etc.) (Steiner 2005, 380; Dotan 2007, 634),
so Saadia probably pronounced *ḥlm* like a Hebrew segolate
noun.[47] The vocalisation *ḥelɛm* (חֵלֶם) does appear in Skoss' man-
uscript of *al-Qawl fī al-Nagham* (Skoss 1952, 292, line 27, foot-
note), and it also occurs in other Masoretic works (Steiner 2005,
377; Khan 2020, I:263).[48] As we will see, that Hebrew form is
probably derived from an earlier Aramaic term, meaning 'closing
firmly', indicating the near-total closure of the lips when articu-
lating /o/.

Stepping down the scale and away from the most-backed
vowels, Saadia then describes the intermediate /a/ and /ɛ/:

ואן שא אן יתגׄאוז בהא הדׄא אלמוצׄע תם יקטעהא עלי מא בעדה טהרת
אלפתחה וקותהא סאירה עלי סטח אללסאן מנחדרה אלי אלספל. ואן
אכׄתאר אן יבקיהא פי הדה אלמוצׄע לכנה ימלא מנהא גׄאנבי פמה
אלספליין טהר אלסגול וקותה משתמלה עלי נצף אלפם אלאספל

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[46] Alternatively, *qāmiṣa* or *qɔmṣɔ*, though Skoss transcribes it with de-
fective spelling and a final *tāʾ marbūṭa*.

[47] That is, a noun of the form *CvCvC* with stress on the onset syllable,
usually containing two *e*-vowels, and ultimately formed from the his-
torical bases *qaṭl/qiṭl/quṭl*.

[48] See also, the Genizah fragment T-S NS 301.69, recto, line 5.

> If one wanted to also pass this point, then they would cut
> off [the melody] at what is beyond it, and *al-fatḥa* would
> appear, its force progressing along the surface of the
> tongue, descending towards the bottom. Then, if they
> chose to keep it at that point, but also fill both bottom sides
> of their mouth, *al-sgwl* would appear, and its force would
> be completely upon the lower half of the mouth. (Skoss
> 1952, 292, lines 14–18)

Saadia indicates that /a/ is *fatḥa* 'opening', adopting the name
for the same vowel in the Arabic grammatical tradition, although
later on he does refer to it with just *ptḥ* (likely pronounced *pɔtaḥ*)
(Skoss 1952, 294, line 1).[49] He again describes the motion of the
vowel's *quwwa*, noting that the *quwwa* of *fatḥa* moves downward
(*munḥadira ʾilā al-safl*) along the tongue. This contrasts the *quwwa*
of *qmṣ*, which moved up towards the velum.[50] *Al-Qawl fī al-
Nagham* thus indicates that the articulation point (*mawḍiʿ*) of /a/
is in the space 'past' the point of /ɔ/ (i.e., more fronted), and its
airflow has a comparatively downward trajectory.

   According to Saadia, the vowel *segol* (/ɛ/) occurs at the
same location in the mouth as /a/, but its *quwwa* moves in a dif-
ferent direction. Rather than passing over the surface of the
whole tongue, *segol*'s *quwwa* only manifests in 'the lower half of
the mouth' (*niṣf al-fam al-ʾasfal*). The speaker compresses it into
this lowered position by 'filling' (*yamlaʾu*) the sides of the mouth,

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[49] This form (פתח) could also be the Arabic word *fatḥ*, and it raises the
question of whether some Hebrew linguists said *patḥa* for /a/.

[50] Compare this language with the words associated with 'high' and
'low' positions in Arabic grammatical texts; see Kinberg (1987, 8) and
above, chapter 3, §2.2.

indicating a slight contraction of the cheeks and the sides of the lips. Unlike the rest of the names in this chapter, the Aramaic word *segol* 'a bunch of grapes' is a graphemic term designating the physical shape of its vowel sign (אֶ), rather than any phonetic feature. The source of this name is most likely the Aramaic name of the Hebrew accent sign *segol/segoltɔ*, which consists of a similar supralinear cluster of three dots (אֱ) (Dotan 2007, 637). This sign and its name likely predate the vocalisation points and the use of *segol* to mean /ε/.

Saadia continues his descent, moving down to the two most fronted vowels on the Hebrew scale:

> ואן גّאז בהא הדّא אלמוצّע תّם קרב טרף אללסאן אלי אסנאנה ולם
> יטבקהא טّהר אלצّירי ואן הו אטבקהא צّהר אלחרק והתّאן אלנגמתאן
> תّגّאור אלّאסנאן מן דאכّלהא

> If one passed this point with [the melody], and then the tip of the tongue drew near to their teeth, but did not cover them, then *al-ṣyry* would appear; and if it did cover them, then *al-ḥrq* would appear. These two vowels are adjacent to the interior side of the teeth (Skoss 1952, 292, lines 18–21).

Ṣyry (/e/) and *ḥrq* (/i/) occur past the point of /a/ and /ε/, at the theoretically 'lowest' position near the front of the mouth. *Ḥrq* requires a slightly lower placement of the tongue than *ṣyry*. Each of these vowel names is a description of a phonetic process (Dotan 2007, 634). In Aramaic, *ṣyry* 'crack, rift, splitting' indicates the narrow fissure between the lips during the articulation of /e/. Meanwhile, the verb *ḥraq* 'to gnash the teeth' would describe the overlapping motion of the teeth in producing /i/. In this instance, *ḥrq* is written without any *matres lectionis,* which

again suggests a vocalisation like a Hebrew segolate noun (e.g., *ḥɛrɛq* 'gnashing the teeth').

Saadia's scale skips /u/, even though earlier Masoretic homograph lists judged it to be *milleʿel* 'above' in comparison to /ɔ/, and should thus precede *al-qmṣ* as the more-backed vowel. Instead, he writes:

ואן גّאוז בהא גّמיע אלמואצّע אלמדצّורה חתי תכרג عن אלאסנאן טֹהר
אלשרק וקותה פי מא בין אלאסנאן ואלשפתין

> If one took [the melody] past all of the aforementioned points, until it exited from the teeth, then *al-shrq* would appear, and its force would be in between the teeth and the lips (Skoss 1952, 292, lines 21–22).

Saadia removes *al-shrq* (i.e., /u/) from the mouth entirely, placing it at the lowest point on his scale, with its *quwwa* moving specifically through the teeth and lips. Noting this odd placement, Dotan points out that /u/ must be at this low point on the scale in order to justify later claims that Saadia makes about Hebrew morphology (Dotan 1974, 28–30). After defining the scale in this section, Saadia spends the second half of the chapter explaining this theory of morphology, which is based on the idea that when a word is inflected or its pronunciation changes due to its context in recitation, the vowels in the that word generally shift to the step immediately above or below it on the scale (Skoss 1952, 300–2). For example, the first vowel in the singular noun *ʿomɛr* 'sheaf' in עֹמֶר הַתְּנוּפָה (Lev. 23.15) is /o/, but in the plural form *ʿɔmɔrim* of בֵּין הָעֳמָרִים (Ruth 2.15), that first vowel moves one step down to /ɔ/ (Skoss 1952, 304, lines 5–6).

Saadia continues in this manner as he records numerous possible vowel changes in Hebrew, describing shifts from a lower

to a higher vowel as 'rising' (*raf*ᶜ; notably the name of the Arabic nominal case), and from a higher to a lower vowel as 'descending' (*habūṭ/ḥaṭṭ/naql*) (Skoss 1952, 302–14). However, he does not find any instances of /u/ 'rising' to another vowel, and only finds three cases total where another vowel—always /o/—'descends' to /u/. As such, he cannot reconcile his theory of morphology based on single-step vowel increments with the phonetic arrangement of the *milleᶜel-millera*ᶜ scale. According to his morphological theory, if /u/ were truly one phonetic step beneath /o/, then words with /o/ (e.g., *ᶜomɛr*) should descend to /u/ (i.e., *ᶜumɔrim*, which does not occur). Likewise, words with /ɔ/ would ascend to /u/, and they do not. Faced with a choice between being wrong about morphology or rearranging the scale, Saadia rearranges the scale, concluding:

> פאדֹ קד תממנא הדֹה אלמרכבאת פינבגי אן נאתי בעדהא בשרח אלבאב
> אלכֹאמס אלדֹי הו מערפה הבוט אלנגמאת מן דרגה אלי אכֹרי ונקול אית
> נגמה מן הדֹה אלסת אלתי דאכֹל אלפם ונעזל אלשרק אדֹ [הו] כֹארגֹ
> אלפם אעני אן קותה באלשפתין פאנה לדֹלך לא מדכֹל לה מע הדֹה אלסת
> אלא פי שי שאדֹ נדֹכרה [לא]חקא.

Now that we have come to the end of these combinations, we must next set forth the explanation of the fifth chapter, which is the knowledge of the descent of the vowels from one level to another. We speak on any of these six vowels which are inside the mouth, and we remove *al-shrq*, since it is outside the mouth. That is, its force is at the lips, and therefore it is not included among these six, except in an irregular case, which we will mention afterwards (Skoss 1952, 300, line 23, to 302, line 5).

With /u/ now outside the mouth, Saadia has no problems: his principles of morphological ascent and descent hold for all vowels within the mouth. His justification for removing /u/ may also be bolstered by an idea from Arabic phonetics, specifically as we have seen in *Kitāb Sībawayh* and Ibn Jinnī's *Sirr Ṣināʿa al-Iʿrāb*, wherein every vowel shares an articulation point with its *mater lectionis* (Sībawayh 1986, IV:101; Kinberg 1987, 16–18; Ibn Jinnī 1993, 8, 53–54; see also above, chapter 2, §3.3, and chapter 3, §2.2). The articulation point of /u/ is thus at the same place as the bilabial *wāw*. It is worth noting that this rearrangement—and probably the morphological theory—may predate Saadia, as several other Masoretic sources (e.g., the two *muṣawwitāt* texts that follow) also put /u/ at the end of their vowel lists.

Despite this morphological pontification, when Saadia does describe the phonetic shift from /o/ to /u/, he still regards it as 'descent' (*ḥaṭṭ*) from *ḥlm* to *shrq* (Skoss 1952, 308, lines 11–12). Additionally, in his *Commentary on Sefer Yeṣira*, written several years after *Kutub al-Lugha*, Saadia explains that there are gradients which occur between the seven vowels, including ones that are between "*al-qamṣa* and *al-fatḥa*" as well as between "*al-ḥlm* and *al-shrq*" (Lambert 1891, 43, lines 7–9). This explanation further suggests that, even though Saadia needs /u/ to be at the bottom of the scale for his morphological system to work, he still acknowledges that it is phonetically nearer to /o/, and thus would have a place within the mouth.

Finally, we come to the word *al-shrq*, Saadia's term for /u/. This name, likely pronounced *shɛrɛq*, means 'whistling', comparing the shape of the lips to the articulation of /u/. Like

ḥlm, ṣyry, and *ḥrq*, it is ultimately based on an Aramaic word in-
dicating the phonetic action required to produce the vowel, but
it appears here as a Hebrew segolate. This name encompasses
both the sign with a single dot inside a *waw* and the sublinear
sign with three oblique dots, as Saadia makes no distinction be-
tween them.

Besides this list of names from *Kutub al-Lugha*, Saadia pro-
vides another list in his *Commentary on Sefer Yeṣira*, and it shows
that his seven vowel terms remained static between the times
that he completed the two works. In the *Commentary*, he includes
the vowels with an account of the alphabet, saying:

يبتدئوا بهذه الـدّבּ ويضمّون اليها الـأ المضاعف ويضيفون اليها الـأ نغمات
اعني קמץ وפתח وחלם وסגול وחרק وצרי وשרק فتصيرלآ

> They begin with these twenty-two, and they bring them
> together with the seven doubles, and then they add the
> seven vowels, I mean, *qmṣ, ptḥ, ḥlm, sgwl, ḥrq, ṣry*, and *shrq*,
> and they make thirty-six. (Lambert 1891, 42, lines 8–10)

The vowel names in this text are essentially identical to those in
Kutub al-Lugha. Besides minor variations with the endings on *qmṣ*
and *ptḥ*, the phonetic terms tend to appear without *matres lec-
tionis*, once again suggesting that they were pronounced as sego-
lates. Some manuscript variants of this list also contain *ḥyrq, ṣyry*,
or *shyrq* (Lambert 1891, 42, nn. 3–5; see also, Steiner 2005, 380–
81), showing that while a shift from normal segolates to terms
with an initial 'symbolic' vowel (i.e., *ḥireq* for /i/, /ḥolem* for /o/)
certainly occurred, the first vowel was not always the one that
the term represented (e.g., *shireq* or *shereq* for /u/). Moreover, in
their original forms—before Saadia and prior to their status as

Hebrew segolates—the phonetic vowel names *ḥlm*, *ḥrq*, *ṣry*, and *shrq* all existed as Aramaic nouns.

Two *muṣawwitāt* texts use phonetic terminology similar to Saadia, but rather than Hebrew segolates, their vowel names are distinct Aramaic nominal forms. The extant manuscripts of these two texts are also notable in that their scripts are quite similar. They may have been copied by the same scribe or by two scribes trained in the same unique style, even though one is square format on parchment (T-S Ar.53.1) and the other is vertical on paper (T-S Ar.31.28).[51] If the copyist was also the author of these texts, then it is clear they held a single systematic conception of the vowel names in Aramaic. On the other hand, they may merely have reproduced two earlier Masoretic treatises with similar terminology. Either way, these two manuscripts were probably produced during a single lifetime around the tenth century. The text from T-S Ar.53.1 begins quite succinctly:

אעלם באן אלמצותאת ז̇ מן סוא אלשוא אלאול חלמא והו או אלٰב קָמֶץ
והו אָא אלג̇ פתח והו אَא אלד̇ סגול והו אֶי אלה צריא והו אֶי אלٰו חרקא
. . . והו אִי אלٰו שרקא והו או אُ ואלשוא והמא אלנקטתאן אלקאימתאן

Know that the vowels are seven, excluding the *shewa*. The first is *ḥlm*ʾ, and it is ʾ*o*. The second is *qɔmeṣ*, and it is ʾ*ɔ*. The third is *ptḥ*, and it is ʾ*a*. The fourth is *sgwl*, and it is ʾ*ɛ*. The fifth is *ṣry*ʾ, and it is ʾ*e*. The sixth is *ḥrq*ʾ, and it is ʾ*i*. The seventh is *shrq*ʾ, and it is ʾ*u*. And then *shewa*, which is

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[51] Square and horizontal format Genizah manuscripts are generally earlier than vertical formats, and parchment Genizah manuscripts are generally older than paper. My thanks to Ben Outhwaite for pointing out the similarity of the scribal hands.

> the two standing dots.... (Allony and Yeivin 1985, 91, line
> 1, to 92, line 9)

Several details stand out from this passage. First, *qɔmeṣ* is vocal-
ised as an active participle, still in its original Aramaic form, and
presumably *pɔtaḥ* would have been as well. Second, the author
spells out all the vowel sounds phonetically (ʾ*a,* ʾ*e,* etc.), a prac-
tice which predates the naming of any vowels, and probably pre-
dates the creation of the pointing system. Third, the name for the
"two standing dots" is vocalised as either *shewa* or *shewɔ* 'equal,
levelling', another Aramaic form.[52] Fourth, the author describes
the shape of the *shewa* grapheme (*al-nuqṭatān al-qāʾimatān*), but
not the vowel signs, suggesting that either the name *shewa* or the
sign itself had only recently been introduced, at a time when the
vowel points had already been well established (Dotan 2007,
634). Finally, the author gives the four phonetic vowel names as
ḥlmʾ (/o/), *ṣryʾ* (/e/), *ḥrqʾ* (/i/), and *shrqʾ* (/u/). These all appear
to be Aramaic emphatic nominal forms, probably *ḥelmɔ, ṣeryɔ,
ḥerqɔ,* and *sherqɔ,* but they are unvocalised in the manuscript.

The second text, from T-S Ar.31.28, provides more infor-
mation for the internal vocalisation of these Aramaic terms. It
begins with a *lacuna,* but the ensuing discussion includes: "*al-ʾo,*
which its name is *ḥlmʾ* (אלאו אלדֿי אסמה חלמא);" "*al-qɔmeṣ* (אלקמֵץ);"
"*al-fatḥa* (אלפתחה);" and "*shrqɔ* (אלשרֵקֿ[א])" (Allony and Yeivin
1985, 99, lines 5–9). Later in the manuscript, the author lists:

אלׄ מלוך והם אלחלמא אעני אוֹ ואלקמצה אעני אֳ ואלפתחה אעני אַ...
ואלסגול והו אֶ ואלצֿרֻיֶא והו אֵ ואלחרקא והו אִ ואלשרקא והו אֻ

> ...the seven *mulūk*, and they are *al-ḥlmʾ*, I mean *ʾo, al-qmṣa*,
> I mean *ʾɔ, al-ptḥa*, I mean *ʾa, al-segwl*, I mean *ʾɛ, al-ṣiryɔ*, I
> mean *ʾe, al-ḥrqʾ*, I mean *ʾi*, and *al-shrqʾ*, I mean *ʾu*. (Allony
> and Yeivin 1985, 102, lines 58–64; see also, present vol-
> ume, cover image)

Once again, the vowels are spelled out phonetically, and the au-
thor names /o/, /e/, /i/, and /u/ with Aramaic emphatic nouns
that end in *ʾaleph*. However, in contrast to those four vowels,
qmṣa (/ɔ/) and *ptḥa* (/a/) are spelled with final *heʾ*.[53] This differ-
ence makes sense, as the names of /ɔ/ and /a/ were derived sep-
arately based on early relative terminology, and here they seem
to be either Arabicised forms (like *fatḥa, kasra, ḍamma*) or retain
an older style of Aramaic orthography. The term from the root
ṣry also stands out, as it is completely vocalised, giving the form
ṣiryɔ. It may be possible to extrapolate this vowel pattern onto
the other unvocalised names (i.e., *ḥilmɔ, ḥirqɔ, shirqɔ*), but it is
perhaps more likely that *ṣiryɔ* was unique in having an initial /i/.
This /i/ may have been contextually conditioned by harmony
with the *yod* in the second syllable, while the other names had
/e/ or /a/ (*ḥelmɔ, ḥerqɔ, sherqɔ*) like most Aramaic nouns of this
pattern.

The vowel names in these two *muṣawwitāt* texts are almost
certainly older than those of *Kutub al-Lugha*. Given that these
works are all written in Judaeo-Arabic, it is not surprising that
they contain some Hebrew and Aramaic technical terms. That
said, since Saadia wrote *Kutub al-Lugha* in the early tenth century,

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[53] Though note the name *ptḥʾ* (פתחא), spelled with *ʾaleph* at least once
in *Diqduqe ha-Ṭeʿamim* (Dotan 1967, 114, line 5).

if its apparent Hebrew segolate terms (*ḥelɛm, ṣyry, ḥrq, shrq*) are the original forms of the phonetic vowel names, then it would be likely that he or someone shortly before him had deliberately created them as Hebraisms to name the Tiberian vowels. If this development occurred, then the authors of T-S Ar.53.1 and T-S Ar.31.28 would have had to take those Hebrew terms and convert them to Aramaic forms (*ḥelmɔ, ṣiryɔ, ḥerqɔ,* and *sherqɔ*) for use in otherwise Arabic texts. It is unlikely that tenth-century Arabic-speaking Masoretes would have calqued Hebrew technical terms into Aramaic in this manner. Much more likely, these Aramaic forms are remnants of an earlier stage of linguistic activity, probably from the second half of the ninth century, when the Masoretes still wrote in Aramaic (see Khan 2020, I:246).

Accordingly, all four of the phonetic names are best understood as Aramaic descriptions of articulation: closing firmly (*ḥelmɔ*; /o/); splitting (*ṣiryɔ*; /e/); gnashing (*ḥerqɔ*; /i/); and whistling (*sherqɔ*; /u/). Then, in the first quarter of the tenth century, some linguists (perhaps Saadia was the first) rendered them with Hebrew segolate forms, creating vowel names like *ḥelem* or *ḥɛlɛm*. These segolates gradually gave way to names with 'symbolic' first vowels, as later grammarians adopted the practice of putting the vowel that a term represented into the term itself (e.g., *ḥolem, qɔmeṣ, pataḥ, sɛgol, ṣere, ḥireq, shureq*) (Steiner 2005, 380; Dotan 2007, 634).

Finally, *qibbuṣ*, the 'modern' name for the three-dot sign of /u/, is the last Hebrew vowel term that has its roots in a phonetic description. It is not derived from the same relative terminology

as *pɔtaḥ* and *qɔmeṣ*, nor was it originally an Aramaic term. Instead, *qibbuṣ* is most likely calqued from *ḍamm*, a by-product of contact between the Hebrew and Arabic grammatical traditions in the period after Saadia and Aharon ben Asher. Evidence of this contact is not limited to *qibbuṣ* alone, and although the phonetic vowel names eventually became the Hebrew standard, tenth- and eleventh-century grammarians also utilised a range of vowel names from the Arabic grammatical tradition.

3.4. Names from Arabic Grammar and the Division of the Vowel Scale

Besides the Aramaic phonetic terms, some tenth- and eleventh-century Hebrew linguists adapted Arabic terms to describe the Tiberian vocalisation system. These Masoretes and grammarians supplemented the basic relative pair of *ptḥ* and *qmṣ* with the names for vowels and cases in the Arabic grammatical tradition. One important example of this phenomenon is the anonymous *muṣawwitāt* text that Allony first identified as *Kitāb al-Muṣawwitāt* (Allony 1964; 1965; 1983; see above, chapter 2, §1.2), which uses a combination of the expanded Hebrew relative names and the Arabic case names to list all of the Tiberian vowels. Similarly, the Masoretic texts *Nequdot Omeṣ ha-Miqrɔ* (*The Dots of the Greatness of the Scripture*) (Baer and Strack 1879, §36, 34, lines 5–9) and *Kitāb Naḥw al-ʿIbrānī* (*The Book of Hebrew Inflection*) (Eldar 1981) show that some scholars modified the *milleʿel-milleraʿ* scale by dividing the vowels into groups according to Arabic case names. Abū al-Faraj Hārūn made comparable modifications to

the scale in his classification of vowels in *Hidāya al-Qārī* (*The Guide for the Reader*) (Khan 2020).

The *muṣawwitāt* text composed of the fragments T-S Ar.32.31 and AIU IX.A.24 (and probably T-S Ar.33.6)[54] uses a unique combination of Hebrew and Arabic vowel terminology. It classifies every vowel in the context of its role in Hebrew grammar, generally by identifying the types of words which most commonly contain each one. Throughout the extant text, the author abbreviates *pɔtaḥ* and *qɔmeṣ* to *pt* (פֿת) and *qm* (קמֿ), though this in itself is not remarkable, as they also abbreviate other common words to save space (Allony 1983, 88). These abbreviations are included in the complete vowel list, which begins:

אלמצותאאת באסמא לאיקה בהא דאלה עלי מעאניהא בלגה ערביה ליכון
סהל עלי אלנאטֹר ובין ללקארי והי אלמצותאאת סבעה אחדהא אלקמֿ
אלכבירה

The vowels have names which are suitable for them, indicating their meanings in the Arabic language, so that they are easy to recognise and clear for the reader. The vowels are seven, and the first of them is *al-qm al-kabīra*. (Allony 1965, 140, lines 28–30)

The first of the 'vowels' (*muṣawwitāt*) is /ɔ/, called *al-qm al-kabīra* large *qameṣ*, following the expanded relative naming convention

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[54] See Allony (1983). He argues that the content of T-S Ar.33.6 is most likely part of the *muṣawwitāt* text in T-S Ar.32.31 and AIU IX.A.24, but the order of the material in this new fragment does not slot neatly into the text of the other fragments. It does contain several passages that match the other almost exactly. At best, we can be sure that one author was copying sections from another, or that two authors were both copying from the same common source.

that uses 'large' to differentiate /ɔ/ from the 'small' *qameṣ*, /e/. The author's second vowel is indeed /e/, which they call *al-qm al-ṣaghīra* 'small *qameṣ*' (Allony 1965, 140, line 35).

Third and fourth are *al-pt al-kabīra* 'large *pataḥ*' and *al-pt al-ṣaghīra* 'small *pɔtaḥ*' (Allony 1965, 142, lines 38–41), which are /a/ and /ɛ/, respectively. They follow the same large-small pairing as /ɔ/ and /e/. Allony's additional fragment (T-S Ar.33.6), which may contain another portion of this text, also uses Arabic versions of the expanded relative terms. After explaining how different uses of /e/ and /ɛ/ are known from the *Mishna*, it reads:

> פאן קאל קאיל מא אלמעׁ פי תקצׁי דׁלך פי אלבׄ ואלגׄ אלתי הי אלפתׁ
> אלצגירה ואל קמׄ אלצגירה קיל לה אן בינהמא פצל ביין כקולנא...

> If someone said, "What is the meaning of you decreeing this, for the two and the three, which are the small *pataḥ* and the small *qameṣ*?" It would be said to him that a distinction is made between them, as we say... (Allony 1983, 110, line 54, to 112, line 56).

The text cuts off at that point, but the author seems to be explaining, to a hypothetical reader who pronounces 'the two [dots]' and 'the three [dots]' the same way, that they are actually distinct phonemes. It also deliberately connects the names 'small *pataḥ*' and 'small *qameṣ*' to the graphemes of /ɛ/ and /e/, although apparently mixed up here, which may indicate that the author had difficulty separating the two sounds. This detail may hint toward the text's regional origin, but is not enough information to determine a definitive provenance. In any case, it is clear that this Masorete named /ɔ/, /e/, /a/, and /ɛ/ by modifying *pataḥ* and *qameṣ* in Arabic.

The fifth vowel in this text is /u/, which the author refers to as *al-ḍamma* 'bringing together, pressing together', using the name for the same vowel in Arabic grammar (Allony 1965, 142, line 43; see above, present chapter, §1.1). They also do not distinguish between the oblique three-dot sign and the single dot in a *mater lectionis waw*, classifying them both as *ḍamma* regardless of their appearance. Despite its Arabic origin, this term is still a basic phonetic descriptor, similar to the Aramaic and Hebrew phonetic vowel names used by Saadia and the relative terminology of the earlier Masoretes. It eventually received a Hebrew calque as the vowel name *qibbuṣ* (later with symbolic vowel, *qubbuṣ*), though not until at least the eleventh century (Dotan 2007, 634).

After /u/, the author goes into greater detail with the phonology of the sixth vowel, /i/. They say, "The sixth is *al-khafḍa*, which is bent to a degree of inclination according to its speaker. It establishes the role of the noun (ואלסדסה אלכֿפצֿה והי אלמנעטפה אלאסם מקאם יקום אנעטאפא קאילהא עלי)" (Allony 1965, 142, lines 45–46). It is unclear precisely what this sentence means. The name *khafḍa* is simple enough: it comes from *khafḍ* 'lowering', the Arabic grammatical term for the genitive case, which is usually marked by /i/. It also served as a name for the phoneme /i/ itself at least as late as the first half of the ninth century (see above, chapter 4, §1.1). The author of this text probably added the feminine suffix -*a* on analogy with the other Arabic vowel names (*fatḥa, kasra, ḍamma*). Then the phrase "bent to a degree of inclination (*'inʿiṭāf*)" evokes the Arabic phonological concept of *'imāla* 'bending down, inclination', which grammarians used

to describe the fronting of /a/ towards /i/ with 'degrees' of incli-
nation around /ɛ/ and /e/ (Levin 2007). In the earliest Arabic
tradition, this ʾ*imāla* was a 'low' classification for fronted allo-
phones of /a/, whereas *naṣb* 'standing upright' indicated 'higher'
allophones produced in the back of the mouth (/a/, /ɑ/) (see
above, chapter 3, §2.2). Most likely, this duality followed the
same identification of backness with 'height' as that found in the
early relative Hebrew and Syriac traditions (see above, chapter
3, §1.0).

An analogy with ʾ*imāla* is probably at play here, but the
'inclination' that the author indicates with ʾ*inʿiṭāf* may also de-
scribe of the directed movement of airflow—the *quwwa*, in Saa-
dian terms—during the articulation of /i/. That is, the airflow of
/i/ is angled downward in comparison to that of other vowels,
and this motion further corresponds to the lexical meaning of
khafḍ 'lowering'.[55] The author even ends up calling it "*al-muṣaw-
wita al-munkhafiḍa*, that is, ʾ*i* (אעני אִי אלמנכֿפצׁה אלמצׁותה)" (Allony
1965, 144, line 53). This means 'the lowered vowel' and uses the
same term that Ibn Jinnī applied to the 'low' consonants articu-
lated away from the 'high' point of the velum (Kinberg 1987, 13).
Finally, the line "it establishes the role of the noun" also seems
to be a reference to Arabic grammar, as only nouns can be in the
khafḍ 'genitive' case.[56]

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[55] For the potential connection between the Arabic case names and di-
rections of airflow, see Eldar (1983, 45–46).

[56] Perhaps compare Abū al-Faraj's attempts to link the Hebrew vowels
to the Arabic cases in *Hidāya al-Qārī* (Khan 2020, II:124–32).

The author concludes the list with /o/, which they also de-
scribe in terms of directed airflow and Arabic grammar. They
name it *al-naṣba*, "which is the marker for past verbs, and it sta-
bilises an inclined characteristic, according to a marker of incli-
nation, establishing the role of the verb (והי אלואצפה ללאפעאל
אלמאצֹיה ואלתֹאבתה וצפא מנעטפא עלי ואצפה אנעטאפא יקום מקאם
אלפעל)" (Allony 1965, 142–44, lines 48–50). In Arabic grammar,
naṣb 'standing upright' is the name of the accusative case, and as
late as the ninth century it could also indicate the vowel /a/. The
author emphasises how *naṣba* is a 'stabiliser' (*thābita*) that ne-
gates 'inclination' (*ʾinʿiṭāf*), apparently applying the same concept
of directed airflow that led Saadia to conclude that /o/ turns nei-
ther upwards nor downwards. It also corresponds to Sībawayh's
usage of *naṣb* to mean a realisation of /a/ without the 'inclining'
allophone of *ʾimāla*, including if that /a/ were backed further to
/ɑ/ or /o/ (i.e., *tafkhīm*, 'thickening') (see above, chapter 3,
§2.2).[57]

The names for the vowels /ɔ/, /e/, /a/, and /ɛ/ are all
based on the expanded relative system, and they seem to have
been well-established in the Hebrew tradition by the time this
muṣawwitāt text was written. By contrast, the text's names for
/u/, /i/, and /o/ do not have direct Masoretic Hebrew equiva-
lents, and the author gives lengthier phonological explanations
to /i/ and /o/. They even phonetically spell out *ʾu* and *ʾi*, revert-
ing to the most basic practice for identifying vowel phonemes.

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[57] For the relationship between *ʾimāla* and *tafkhīm*, see Talmon (1997,
136, 141) and Makhzumi (1985, III:317; IV:103, 281). See also above,
chapter 3, §2.2, and chapter 4, §1.1.

This factor reinforces the conclusion that these three names were adopted later than the others. The author's choice to name /u/ (*ḍamma*), /i/ (*khafḍa*), and /o/ (*naṣba*) with Arabic vowel terms is thus a way for them to supplement the expanded relative system, in the same way that other Masoretes supplemented *ptḥ* and *qmṣ* with graphemic and phonetic names. This addition of Arabic case names to fill out the set of Hebrew names parallels the Syriac tradition, where some authors adopted calques of *naṣb* (*zqɔpɔ*; /ɔ/) and *rafʿ* (*massaqɔ*; /o/) to identify their vowels (see above, present chapter, §2.0). It may also be relevant that while /ɔ/ remained a distinct phoneme in East Syriac, it shifted to /o/ in West Syriac (Knudsen 2015, 92). West Syrians still called this vowel *zqɔpɔ* 'standing upright', so if any Masoretes in Syria or Palestine translated that term for their /o/, then *naṣba* would have been the logical calque.

This vowel list diverges considerably from the one in Saadia's *Kutub al-Lugha* and does not follow the expected scale order at all. However, the use of *naṣba* and *khafḍa* and the idea of *ʾinʿiṭāf* do seem to describe articulation points and directions of airflow for certain vowels, similar to Saadia's explanations of the vowels' *quwwa*. This similarity suggests that the concept of directed airflow as a phonological feature of vowels existed in the Hebrew linguistic tradition outside of (and possibly prior to) Saadia's description of the vowel scale, although it is not clear whether this *muṣawwitāt* text is itself older than *Kutub al-Lugha*.

The use of Arabic case names to describe Hebrew vowel phonemes is also not limited to this *muṣawwitāt* text, as similar

interpretations appear in other sources from the tenth and eleventh centuries. Two of these sources are the Masoretic texts known as *Nequdot Omeṣ ha-Miqrɔ* (*The Dots of the Greatness of the Scripture*) and *Kitāb Naḥw al-ʿIbrānī* (*The Book of Hebrew Inflection*), both of which divide the Hebrew scale into groups based on the Arabic case names. *Nequdot Omeṣ ha-Miqrɔ* comes from the Masoretic material attached to the Leningrad Codex, although parts of the text are also known from other sources (see Eldar 1983), and Baer and Strack first published it as an appendix to their edition of *Diqduqe ha-Ṭeʿamim* (1879, §36, 34–36). Then *Kitāb Naḥw al-ʿIbrānī*, which is extant from the Cairo Genizah, includes a Judaeo-Arabic explanation of the vowel scale. Ilan Eldar first published two fragments of this text in 1981, arguing that the first one contained either a summary or extract of *al-Qawl fī al-Nagham*, the fifth chapter of Saadia's *Kutub al-Lugha* (Eldar 1981; see Dotan 1997, I:114–15; Khan 2020, I:265–66). However, *Kitāb Naḥw al-ʿIbrānī* does not use any of the phonetic vowel names that Saadia uses in *al-Qawl fī al-Nagham*, even though both texts contain complete vowel lists. Instead, the section on the vowel scale in *Kitāb Naḥw al-ʿIbrānī* bears such a striking resemblance to *Nequdot Omeṣ ha-Miqrɔ* in its terminology, format, and word order that its Judaeo-Arabic author must have had access to that Hebrew text. As we will see, the vowel scale in *Kitāb Naḥw al-ʿIbrānī* is actually a translation of a passage from *Nequdot Omeṣ ha-Miqrɔ*, and its author attempts to clarify some omissions in that original Masoretic version. Both versions apply a description of a vowel scale that is similar to the scale in *Kutub*

al-Lugha, but they divide that scale with the names of the Arabic grammatical cases.

As discussed above, *Nequdot Omeṣ ha-Miqrɔ* begins by listing the seven Tiberian vowels, using terms from *ptḥ*, *qmṣ*, 'three dots', and phonetic transcriptions of vowel phonemes. After this initial list, the text then reads:

> פתרונם אגידה וצרופם אחודה דרך הרום אוֹ אוּ שתים נחויות ודרך מטה
> אֶי אִי מנויות והשלוש להציב עשׂויות אָה אַה אֶי הראויות ואחת סתם
> כלויות לא תצא בכל פעם בפיות

> And their interpretation, I will tell it; their combination, I will unite it: to the way upwards, both *ʾo* and *ʾu* are led; and the way downwards, *ʾe* and *ʾi* are counted. [As for] the three which are made to stand upright, *ʾɔ*, *ʾa*, and *ʾɛ* are the right ones; and one stops up completely, not pronounced in any instance in the mouths. (Baer and Strack 1879, 34, lines 9–12)

Eldar has also identified this passage as particularly important for understanding Hebrew vocalisation, and argues that it describes a theory of vowel phonology based on directions of airflow (1983, 43–46). He suggests that these three phonetic groups—*rum* 'rising', *maṭṭah* 'descending', and *lehaṣṣiḇ* 'standing upright' (from *nṣb*)—are calques of the Arabic *rafʿ*, *khafḍ*, and *naṣb* (Eldar 1983, 46).[58] He further argues that the names of each of these groups corresponds to the direction of airflow during the articulation of its vowels. That is, the airflow of /o/ and /u/ is angled upwards, that of /e/ and /i/ is downwards, and /ɔ/, /a/,

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[58] He also notes that instead of *maṭṭah*, another version of this passage has *shaḥiyyɔ* 'bending down, depressing' (Eldar 1983, 43), which could even be a calque of *ʾimāla*. See also, Revell (1975, 188, n. 2).

and /ɛ/ are relatively straight.[59] By the same token, the one that 'obstructs' or 'stops up completely' (i.e., the *shewa*) cuts off the flow of air. It is equivalent to Arabic *waqf* 'stopping' or *jazm* 'cutting off', both of which indicate silence on a consonant. The *le-haṣṣiḇ* group also contains the same triad of vowels that Elias of Ṭirhan associated with *ʾalaph* (*zqɔpɔ*, /ɔ/; *ptɔḥɔ*, /a/; *rbɔṣɔ*, /e/), and corresponds to the allophones of *ʾalif* from *Kitāb Sībawayh* (*tafkhīm/naṣb*, /ɑ/ or /ɔ/; *fatḥ*, /a/; *ʾimāla*, /ɛ/ or /e/) (see Khan 2020, I:267). This correlation further shows how an idea of *a*-vowels 'standing upright' (*lehaṣṣiḇ*, *zqɔpɔ*, *naṣb*) existed, in some form, in all three traditions.

Kitāb Naḥw al-ʿIbrānī offers a similar description of the phonetic vowel groups, and in fact its language is so similar to *Nequdot Omeṣ ha-Miqrɔ* that one of these authors must have had access to the other's work. The first part reads:

קאל מכّתצר הדֿא אלכתאב אן ללגה אלעבראניה חֿ נגّמאת נחו והי
אתֿנתאן פי אלרפע ואתֿנתאן פי אלכֿפῢ ותֿלתֿה פי אלנצב ואאחדה הי
אלגֿזם פנגّמתי אלרפע הי אלאוֺ ואלّאוّ ונגّמתי אלכֿפῢ אלّאֵי ואלّאִי ותֿלתֿ
נגّמאת אלנצב הי אלקמצה ואלפתחה ואלתֿלת נקט ונגّמה אלגֿזמה הי
אלשّוא

The abridger of this book said that the Hebrew language has eight melodies of inflection, and they are two in rising, two in lowering, three in standing upright, and one which is cutting off. The two melodies of rising are *ʾo* and *ʾu*, the two melodies of lowering are *ʾe* and *ʾi*, the three melodies of standing upright are *qamṣa*, *fatḥa*, and the three dots,

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and the melody of cutting off is the *shewa*. (Eldar 1981,
116, lines 1–6)[60]

This Masorete calls the vowel groups *al-rafᶜ* 'rising', *al-khafḍ* 'low-
ering', *al-naṣb* 'standing upright', and *al-jazm* 'cutting off', using
the Arabic terms for the nominative, genitive, and accusative
cases as well as the name for the jussive mood. In the early Arabic
linguistic tradition, these *ʾiᶜrābī* terms could also refer to /u/, /i/,
/a/, and vowellessness, respectively, based on the most common
inflectional endings for each grammatical case (Versteegh 1993,
16–20; see above, present chapter, §1.1). It is clear that this au-
thor chose these words to classify Hebrew 'inflection' due to a
familiarity with Arabic grammar. However, it remains uncertain
whether the author of *Kitāb Naḥw al-ᶜIbrānī* selected Arabic terms
to match a pre-established phonetic division of the Hebrew vow-
els—perhaps one that was originally defined in *Nequdot Omeṣ ha-
Miqrɔ*—or if the author of *Nequdot Omeṣ ha-Miqrɔ* first defined
the groups in Hebrew according on their own interpretation of
the Arabic *ʾiᶜrāb* system.

Besides the lexical connections to Arabic, this three-way di-
vision of vowels from *Nequdot Omeṣ ha-Miqrɔ* seems to apply a
variation of the 'directed airflow' concept that Saadia used to de-
scribe vowels on his scale. While Saadia defined vowel quality
primarily according to relative backness in the mouth and along
the vertical vowel scale, the motion of a vowel's *quwwa* 'force'
was partially responsible for determining quality. *Nequdot Omeṣ*

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[60] Eldar's edition is based on the Genizah fragment MS Cambridge, T-S
Ar.5.46, although the caption with the plate in his article incorrectly
identifies it as T-S Ar.5.48.

ha-Miqrɔ's author follows the same scale, and they also seem to group the vowels according to their directions or 'ways' (*derɔḵim*) of motion (Eldar 1983). However, while this author decides that /o/ has an upward movement, Saadia determined that /o/ was 'unwavering', proceeding straight ahead, in contrast to /ɔ/ and /a/, which moved either up or down. Similarly, the author of the *muṣawwitāt* text in T-S Ar.32.31 and AIU: IX.A.24 refers to /o/ as *naṣba*, suggesting that even though the direction of airflow was important to some tenth-century Hebrew phonologists, its application was not standardised. The extant version of *Nequdot Omeṣ ha-Miqrɔ* was not completed until 1008, but given that it is written entirely in Hebrew, its version of the airflow concept may actually predate the Judaeo-Arabic material found in Saadia's scale and the *muṣawwitāt* text.

The next section of *Nequdot Omeṣ ha-Miqrɔ* reinforces its connection to the ideas in *Kutub al-Lugha* and reveals its true relationship to *Kitāb Naḥw al-ʿIbrānī*. The text continues by describing a vowel scale:

> ולאלה המלכים דרכים נסוכים אחת באחת נסמכים. ראשונה דרך רומָה
> והיא אוֹ הנאומה ולמטה ממנה קָמצה והיא במצב הגדול במחצה ולמטה
> ממנה פַתחה לחריצה ו[היא] במצב האמצעי למליצה ולמטה ממנה שלוש
> נקודות לאמיצה ולמטה ממנה שלישית תפיצה והיא נקודה אחת מחוצה.
> [אוֹ] לבדה נשארה לא תמנה עם אלה בספירה לעֻלֶה גדולה ויתרה אותה
> אזכירה ועניָנה אבארה.

> And these vowels have various ways; each one comes next to another. First is the way upwards, and it is spoken *ʾo*. Then below it is *qɔmṣɔ*, which is in the large grade at the partition; then below it, *patḥɔ* is for its slot, which is at the intermediate grade for its interpretation. Below it, three dots are for its appointment; and it [*patḥɔ*] disperses to

third below, which is one dot squeezed. [ʾ*U*]⁶¹ alone yet remains, not counted with these in the account, for a great and abundant reason, [which] I will mention, and its issue, I will explain it. (Baer and Strack 1879, 34, line 12, to 35, line 1)

This scale follows the same vertical arrangement as the one in *Kutub al-Lugha*, although it has some variations. The 'way up-wards' (*dɛrɛḵ rumɔ*) is /o/. Below that is /ɔ/ (*qɔmṣɔ*), 'at the par-tition' (*b-meḥiṣṣɔ*) between the 'way upwards' and the intermedi-ate positions. Following /ɔ/ is /a/ (*patḥɔ*), and these two are united in that they are both at a *maṣṣaḇ* 'grade, rank, position', a noun of place derived from the same root as the *lehaṣṣiḇ* classifi-cation earlier in the text (and *naṣb*, for that matter). The author adds that the *maṣṣaḇ* of /ɔ/ is 'large' (*gadol*), while that of /a/ is 'middle' (*ʾemṣɔʿi*). Interestingly, they do not also specify /ɛ/ ('three dots') as being at another *maṣṣaḇ*, nor do they give it a size characteristic like the other members of the *lehaṣṣiḇ* group, though they do say that it is below /a/. Then after /ɛ/, there is the notable omission where we might expect to find /e/. It is as if there is a missing line which should say "and second below it is two dots." The author instead says "it [*patḥɔ*] disperses to third

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⁶¹ Baer and Strack suggest that 'one dot' here should be interpreted as /u/ (i.e., ֻ), while the final, excluded vowel should be /i/. However, they note that there is variation between the extant versions of this text, and one manuscript has /u/ for this excluded vowel. Based on a com-parison with the vowel scale in *Kutub al-Lugha* and the Arabic transla-tion of this passage in *Kitāb Naḥw al-ʿIbrānī*, it seems that the final vowel here should be /u/, and I have rendered it as such in [brackets]. See Baer and Strack (1879, 34, nn. C, c, and V, 3).

below it (*lemaṭṭɔh mimɛnɔh shelishit tapiṣɔh*)," counting three steps down from /a/ to /i/. They specify this vowel as 'one dot squeezed' (*nequdɔ ʾaḥat meḥuṣɔ*). *Meḥuṣɔ* 'squeezed, crushed' here likely indicates the closing of the mouth when articulating /i/ in contrast to the openness of /a/, applying a description similar to what we have seen for /i/ and /u/ in Syriac sources.[62] Finally, this scale specifically excludes /u/, just as Saadia placed it outside of the mouth at the bottom of his scale.

Using the same organisational structure, *Kitāb Naḥw al-ʿIb-rānī* likewise follows its initial list of four groups with an explanation of the positions of the vowels, seemingly translating and amending the scale passage from *Nequdot Omeṣ ha-Miqrɔ*. It reads:

> ולהדֿא אל[זֿ] נגמאת דרגֿאת מרתבה אלואחד פוק אלאכֿרי פנדֿכרהא
> ונקול אן אלדרגֿה אלעוליא הי דרגֿה אלרפע אלאכבר והי אלאוֹ ודונהא
> דרגֿה אלקמצה והי אלנצב אלכביר ודונהא דרגֿה אלפתחה והו אלנצב
> אלאוסט ודונהא דרגֿה אלתֿלתֿה והי {דרגֿה אלתֿלתֿה והי דרגֿה} [אלנצב
> אלאצֿגר ודונהא דרגֿה אלאֵי והי דרגֿה אלכֿפֿץֿ אלאצֿגר ודונהא דרגֿה]
> אלנקטה אלואחדה והי אלכֿפֿץֿ אלאכבר ותבקא נגמה אלאוֹ מפרדה לא
> תדכֿל פי תרתיב אלדרגֿאת ולדֿלך לעלה סאצפהא פי מא יסתאנף

> These [seven] melodies have levels, arranged one above another, and we will mention it and say that the top level is the level of the greater *rafʿ*, and it is the *ʾo*. Below it is the level of the *qamṣa*, and it is the great *naṣb*, and below it is the level of the *fatḥa*, and it is the intermediate *naṣb*. Below it is the three, and it is {the level of the three, and

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[62] E.g., *ḥbɔṣɔ* (/i/, /u/), *ʿɔṣɔ* (/u/), *zribɔ* (/e/). See above, present chapter, §2.0.

> it is the level}[63] [of the lesser *naṣb*, and below it is the level
> of the *ʾe*, and it is the level of the lesser *khafḍ*. And below
> it is the level of the][64] single dot, and it is the greater *khafḍ*.
> The melody of the *ʾu* alone remains, not entering into the
> arrangement of the levels, and that is because of a reason
> which I will describe in what remains. (Eldar 1981, 116,
> line 1, to 118, line 15)

In this scale, the vowel pronounced farthest back in the mouth
(/o/) is deemed the 'greater *rafʿ*' (*al-rafʿ al-ʾakbar* 'greater rising')
aligning the Arabic term for /u/ with the highest position in the
vowel scale. *Naṣb* 'standing upright', an Arabic name for /a/, then
correlates to the middle positions of /ɔ/ and /a/, though /ɔ/ is
the 'large' (*kabīr*) *naṣb*, while /a/ is 'middle' (*ʾawsaṭ*). In opposi-
tion to the topmost 'greater *rafʿ*', the lowest vowel /i/ is *al-khafḍ
al-ʾakbar* 'greater lowering', using the Arabic name for /i/ that is
associated with low positions in the mouth (see above, present
chapter, §1.1).[65] As we have seen time and again, backed vowels
are perceived as 'high' while fronted vowels are 'low'.

   Eldar assumes that the passage's text in {curled brackets}
is an error that should be omitted. He then inserts the text in
[square brackets], adding what he assumes to be a 'lesser *naṣb*'
designation for /ɛ/ and a contriving a separate 'lesser *khafḍ*'
clause to define /e/. He is probably correct that the scribe made

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[63] Eldar interprets the text in {curled brackets} as a mistaken reduplica-
tion.

[64] The text in [square brackets] is Eldar's insertion, which does not ap-
pear in the manuscript.

[65] See also, Dotan (1997, I:113–15), Khan (2020, I:265–66), and Pose-
gay (2020, 221–22).

some kind of mistake in writing "the level of the three, and it is the level of… (*daraja al-thalātha wa-hiya daraja…*)." However, his insertion then assumes that the manuscript's lack of a description for /e/ is also an error, but this is not the case. Together, these 'mistakes' suggest that this passage is translated directly from *Nequdot Omeṣ ha-Miqrɔ*, which awkwardly includes the word *shelishit* 'third' in the clause after *shɔlosh nequdot* 'three dots'; does not assign a *maṣṣaḇ* to /ɛ/; and entirely omits /e/. *Kitāb Naḥw al-ʿIbrānī*'s line about excluding /u/ from the arrangement, and how they will explain it later, is also a translation of the corresponding sentence in *Nequdot Omeṣ ha-Miqrɔ* (Baer and Strack 1879, 34, line 17, to 35, line 1), albeit without some of the payyeṭanic flair. Finally, rather than using a superlative adjective to describe /ɔ/ (as they do for *al-khafḍ al-ʾakbar*), the author of *Kitāb Naḥw al-ʿIbrānī* refers to *qamṣa* as *al-naṣb al-kabīr* 'large *naṣb'*, literally translating the basic Hebrew adjective in *Nequdot Omeṣ ha-Mi-qrɔ*'s phrase *maṣṣaḇ gadol* 'large grade'. This last detail is especially important, as it strongly indicates that *Kitāb Naḥw al-ʿIbrānī* is a translation of *Nequdot Omeṣ ha-Miqrɔ*, not the other way around.

Based on this comparison of the structure and omissions in these two texts' vowel scales, it is highly likely that the author of *Kitāb Naḥw al-ʿIbrānī* had access to *Nequdot Omeṣ ha-Miqrɔ* and converted its somewhat vague poetic Hebrew into clearer Arabic prose. This conclusion casts doubt on Eldar's initial claim that *Kitāb Naḥw al-ʿIbrānī* is an abridgement of the fifth chapter (*al-Qawl fī al-Nagham*) of Saadia's *Kutub al-Lugha*, and has implica-

tions for the origin of the vowel scale itself. This doubt is reinforced by the fact that *Kitāb Naḥw al-ʿIbrānī* and *Nequdot Omeṣ ha-Miqrɔ* use essentially the same vowel names (*ʾo, qamṣa, fatḥa*, 'the three', 'one dot', and *ʾu*), but neither uses Saadia's phonetic vowel names (*ḥelɛm, ḥɛrɛq, shɛrɛq, ṣere*). The section explaining the scale in *Kitāb Naḥw al-ʿIbrānī* should thus be understood as a recension of the vowel scale given in *Nequdot Omeṣ ha-Miqrɔ*, not *al-Qawl fī al-Nagham*.

Kitāb Naḥw al-ʿIbrānī's scale also provides details that may influence the interpretation of *Nequdot Omeṣ ha-Miqrɔ*. First, Eldar's emendations notwithstanding, neither version of this scale explicitly classifies /ɛ/ as one of the *naṣb* vowels, although such a grouping may be implied. Second, the author of *Kitāb Naḥw al-ʿIbrānī* resolves the ambiguity in the Hebrew and makes clear that /i/ is 'the one dot', while /u/ is the vowel which is outside the mouth. Third, because the Judaeo-Arabic description of this vowel scale is a translation of the Hebrew, it is *not* certain that the author of the Hebrew version in *Nequdot Omeṣ ha-Miqrɔ* actually modelled the three-way *rum-maṭṭah-lehaṣṣiḇ* division of the vowels on the Arabic case names *rafʿ, naṣb,* and *khafḍ*. Instead, the author of *Kitāb Naḥw al-ʿIbrānī* may have rendered an earlier Hebrew concept of vowel grouping to fit known Arabic phonological terms. That said, it is also not obvious why a Masorete would have divided the seven vowels of the original *milleʿel-millera ʿ* scale into these three groups (see Khan 2020, I:267), at least without Arabic influence.

There is one more notable division of the vowel scale, found in Abū al-Faraj's (d. c. 1050) *Hidāya al-Qārī*. He also incorporates Arabic grammatical terminology, but his vowel names differ from those discussed above (see Khan 2020, I:266; II:112–32). Abū al-Faraj writes:

אלרפע פי לגה אלעבראני דכל תחתה נגמתאן והמא או ואו ואלנצב ידכל
תחתה ג֗ נגמאת אלפתחה אלכברי והי אָ ואלפתחה אלוסטי והי אֶ
ואלפתחה אלצגרי והי אָ ואלכפֿץ֗ ידכל תחתה נגמתאן והמא אֵי אִי.

> *Rafᶜ* in the Hebrew language includes two melodies: ʾo and ʾu. *Naṣb* includes three melodies: the greater *fatḥa*, which is ʾa, the middle *fatḥa*, which is ʾɛ, and the lesser *fatḥa*, which is ʾɔ. *Khafḍ* includes two melodies: ʾe and ʾi. (Khan 2020, II:125–27, lines 739–44)

Rafᶜ 'rising' includes the two 'highest', most-backed vowels, /o/ and /u/, following the logic of the *milleᶜel-millera*ᶜ scale. It may also correlate to the angled direction of the airstream during the articulation of each vowel (see Eldar 1983), though we again recall Saadia and the *muṣawwitāt* author who identified /o/ with *ghayr ḥāʾida* 'unwavering' and *naṣba* 'standing upright'. As expected, Abū al-Faraj's antonym for *rafᶜ* is *khafḍ* 'lowering', which includes the two most-fronted vowels, /e/ and /i/.

Abū al-Faraj suggests that all three vowels of the *naṣb* 'standing upright' group are types of *fatḥa* 'opening', including /a/, /ɛ/, and /ɔ/. He qualifies these *fatḥa*s according to varying degrees of openness: /a/ is *al-fatḥa al-kubrā* 'the greater opening', /ɛ/ is *al-fatḥa al-wusṭā* 'the middle opening', and /ɔ/ is *al-fatḥa al-sughrā* 'the lesser opening'. This description contrasts the vowel scale in *Kitāb Naḥw al-ᶜIbrānī*, where /ɔ/ was 'large' (*kabīr*) rather than small, and the 'sizes' (i.e., ʾakbar, ʾasghar) of vowels

correlated with backness rather than openness. Abū al-Faraj maintains this difference later in the chapter when he refers to these vowels as *al-naṣb al-ṣaghīr* 'the small *naṣb*' (/ɔ/) and *al-naṣb al-kabīr* 'the large *naṣb*' (/a/) (Khan 2020, II:129, line 773, 131, line 779), apparently exchanging *naṣb* for *fatḥa* without accounting for the relative backness of the two *a*-vowels. Interestingly, he does not name /ɛ/ using *naṣb* in this way (Khan 2020, II:131, line 782), a detail which matches the descriptions of /ɛ/ in *Nequdot Omeṣ ha-Miqrɔ* and *Kitāb Naḥw al-ʿIbrānī.*

These divisions of the vowel scale reveal the extent to which medieval Hebrew linguists adapted Arabic ideas about grammar and phonology to better explain the language of the Bible. They also represent the culmination of the *milleʿel-milleraʿ* scale,[66] which earlier Masoretes used to compare vowel qualities on a relative basis. These comparisons coincided with the use of relative vowel terminology, like *pɔtaḥ* and *qɔmeṣ,* that could indicate multiple different vowels, depending on their context. As absolute vowel pointing gained popularity, Hebrew scholars began to apply these two relative terms to the vowels which they most often described, namely /a/ and /ɔ/. They then supplemented these two terms with a variety of other absolute naming conventions, including expansions to the relative system (e.g., *pɔtaḥ qɔton* for /ɛ/) and the association of vowel phonemes with the appearance of their vocalisation signs (e.g., *al-thalātha* for /ɛ/; *al-taḥtonī* for /i/). Others introduced names connected to the articulatory processes involved for each vowel, first as Aramaic

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[66] For additional medieval descriptions of this scale, see Neubauer (1891, 15–16) and Allony (1971, 11).

nouns, then as Hebrew segolates, and finally as Hebrew names with 'symbolic' vowels that matched their quality (e.g., *ḥelmɔ*, *ḥelɛm*, *ḥolem* for /o/). Finally, a few authors also adopted Arabic grammatical terminology, both as vowel names (e.g., *naṣba* for /o/) and to divide the vowels into groups. This history of vowel naming is thus a record of the transition from relative to absolute vocalisation, crosscutting Masoretic pedagogy, Hebrew scribal practices, and Arabic grammar in the linguistic science of the early medieval period.

4.0. Summary

The phenomenon of assigning unique names to individual vowel phonemes is common to the Arabic, Syriac, and Hebrew linguistic traditions. As members of all three groups created absolute vocalisation systems to record their vowels, they also developed new terminology to discuss the vowel phonemes that did not have dedicated letters in their writing systems. These new terms were derived gradually over the course of multiple centuries, often as the result of contact between different strains of phonological thought within a single linguistic tradition, or from contact between different languages. In almost all cases, the core elements of these naming systems descended from earlier terminology that first described relative features of vocalisation.

The earliest absolute vowel names emerged in the Arabic linguistic tradition, where eighth-century grammarians created two sets of terms for their three vowels: *fatḥ* (/a/), *kasr* (/i/), *ḍamm* (/u/); and *naṣb* (/a/), *khafḍ* (/i/), *rafᶜ* (/u/) (also *jarr*, /i/). Neither set clearly predates the other, but the first—the 'non-

ʾiʿrābī̆ʾ set—describes the phonetic action required to articulate each vowel, while the second—the ʿʾiʿrābī̆ set'—indicates the relative 'height' position in the mouth where a vowel was articulated. This latter set was most likely an expansion on an earlier two-way contrastive pair, in which *naṣb* 'standing upright' indicated relatively-backed allophones of *ʾalif* in Qurʾānic recitation (i.e., /a/, /ɑ/) and *ʾimāla* (bending down) represented relatively-fronted allophones (/ɛ/, /e/). This comparison was based on a perception of the back of the mouth as 'high' while the front was 'low', a principle which mirrors the 'above-and-below' relative comparisons of early Syriac and Hebrew homograph lists. Al-Khwārizmī also transmits a list of supplementary terms that describe Arabic vowels in specific morphosyntactic positions. Some of these additional names are linguistic terms, but others come from the vocabulary of prosody and Qurʾānic recitation, and while al-Khwārizmī attributes them to al-Khalīl ibn Aḥmad, there is little reason to think that they comprised a single coherent system in the eighth century.

Despite what has been suggested in previous scholarship, all seven of the Arabic names for cardinal vowels are attested before absolute vowel terms appear in the Syriac linguistic tradition, and thus they cannot be calques of Syriac terminology. More likely, Syriac writers like Dawid bar Pawlos (fl. 770–800), Ḥunayn ibn Isḥāq (d. 873), and Elias of Ṭirhan (d. 1049) calqued the Arabic terms *naṣb* 'standing upright' and *rafʿ* 'rising' to name Syriac vowels which had no equivalent Arabic phonemes: *zqɔpɔ* 'standing upright' (/ɔ/) and *massaqɔ* 'raised up' (/o/ or /e/). However, other Syriac vowel terms—*ptɔḥɔ, zribɔ, rbɔṣɔ, sheshlɔ,*

rwɔḥɔ, ʾalɔṣɔ, ḥbɔṣɔ, ʿṣɔṣɔ—are likely native Syriac inventions, all derived from the relative comparisons of openness first explained by Jacob of Edessa (d. 708). Participial forms from *ptḥ, zqp, ḥbṣ,* and *ʿṣṣ* appear as early as Dawid bar Pawlos' *scholion* on *bgdkt* letters, while *zribɔ* and *rbiṣɔ* are first attested in the Syriac lexica of ʿĪsā ibn ʿAlī (d. c. 900) and Ḥasan bar Bahlul (fl. 942–968). *Rwɔḥɔ* and *ʾalɔṣɔ* first occur definitively as vowel names in the eleventh-century grammars of Elias of Nisibis (d. 1046) and Elias of Ṭirhan (d. 1049), although they may be linked to an earlier tradition of Ḥunayn ibn Isḥāq.

Several different vowel naming conventions developed within the Hebrew Masoretic and early grammatical tradition prior to the eleventh century, four of which contributed to the set of absolute names that eventually became standard. The earliest of these four includes *pɔtaḥ* 'opening' and *qɔmeṣ* 'closing', which solidified as absolute names for /a/ and /ɔ/ with the decline of the relative vocalisation, likely around the time that the Tiberian vowel points were invented. Then, during the ninth and tenth centuries, Hebrew scholars described their other five vowels using graphemic descriptions (e.g., *nuqtatayn, zujj, segol*), phonetic descriptions (*ḥelmɔ, sherqɔ, ṣiryɔ, ḥerqɔ*), and Arabic grammatical terminology (*naṣba, khafḍa, ḍamma/qibbuṣ*). Following the tradition of earlier *milleʿel* 'above' and *milleraʿ* 'below' relative comparisons, Saadia Gaon (d. 942) and other linguists also placed the Hebrew vowels on a scale, corresponding to their relative 'height' within the mouth. Some writers even divided this scale into sections based on the Arabic case names.

The absolute vowel naming traditions in Arabic, Syriac, and Hebrew could not exist, at least as we know them, in isolation. Each one evolved in the context of the other two, continuously absorbing and adapting new terms and principles as a result of intellectual and scholastic contact. The previous sections have shown the extent to which the principles of relative and absolute vocalisation connect these three traditions, but in truth, they only begin to scratch the surface. Besides the connections between the terms discussed above, there are also vowel names which are cognates with accent names in other traditions; for example: Syriac *zqɔpɔ* and Hebrew *zɔqep̄*; Syriac *massaqɔ* and Hebrew *silluq*; Syriac *sheshltɔ/sheshlɔ* and Hebrew *shalshelet*; Syriac *mpaggdɔnɔ* and Hebrew *meteg*;[67] and Arabic *jarr* and Syriac *gɔrorɔ* (see Talmon 1996, 290–91; 2000, 250; 2008, 174; and above, present chpater, §1.1). Undoubtedly, vocalisation and vowel phonology are closely related to concepts of accentuation and cantillation, and future studies must combine the history of vocalisation with that of cantillation to reveal a more complete picture of connections between the medieval Arabic, Syriac, and Hebrew recitation traditions.

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[67] These two are not cognates, but they both mean 'bridling'.