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the basis of the children's productions, there is evidence that it also affects their perception.

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Phonology: Biblical Hebrew

INTRODUCTION

This entry treats the phonology of Biblical Hebrew, though on occasion we will refer to data from beyond the domain of BH *per se*. The methodology utilized here is that of historical linguistics, especially since the relevant information covers more than a thousand years (for an earlier treatment, on which the current essay is largely based, see Rendsburg 1997; for amplification of some of the topics treated herein, see Kutscher 1982:12–30; for theoretical approaches to the subject → Phonology, Generative and Phonology, Optimality Theory: Biblical Hebrew; for a synchronic description of the Tiberian tradition of Hebrew on the basis of medieval sources → Tiberian Reading Tradition).

The subject of Biblical Hebrew phonology is complicated by the fact that ancient Hebrew was written with a 22-consonant alphabet—though as we shall see, Hebrew possessed more than 22 consonantal phonemes, so that some of the graphemes (letters) served double duty. Moreover, vowels were not represented in the

writing system (except to some extent via the use of *matres lectionis*), though, presumably, any reader of an ancient Hebrew composition would have known how to recite the text on the basis of an oral reading tradition passed from tradent to tradent (especially for literary works, such as those which eventually entered the biblical canon).

Eventually, Jewish scholars, known as the Masoretes (from the word *מסורה* *māsōrā*, meaning either ‘tradition’ or ‘counting’ [see Dotan 2007:614–615]), created a system of vowel (along with accent and punctuation) notation during the 8th–9th centuries C.E. In fact, there were three main systems of vocalization, though in this article we will for the most part focus on the Tiberian system, which in time emerged as the dominant one in Jewish society.

The question remains as to how accurately the oral reading tradition of the biblical text and the Masoretic transcription thereof reflects ancient Hebrew. That is to say, the Masoretic Text (i.e., the traditional text of the Bible) dates to c. 850 C.E. and reflects the manner in which Biblical Hebrew was pronounced at that time. But how conservative, i.e., how ancient, was the reading tradition of the readers for the centuries before c. 850 C.E.? In other words, does the Masoretic Text reflect Hebrew as it was pronounced five hundred years earlier, one thousand years earlier, even fifteen hundred years earlier? In some cases, we can answer this question, but no definitive conclusion can be reached. Nevertheless, we will base ourselves on the assumption that the readers of the 1st millennium C.E. were extremely conservative in their biblical reading tradition, so that the Masoretic Text more or less accurately reflects the pronunciation (or at least one pronunciation) of ancient Hebrew in the 1st millennium B.C.E., i.e., the time of the composition of the biblical books (see Morag 1974). I say “more or less” because, among other points, (a) in some instances we know that the Masoretes no longer recognized consonantal phonemes which were distinguished in ancient Hebrew, but which merged at a later date; (b) the system of vowels according to the Masoretic notation has a large number of allophones, some or many of which may have developed only after

the ancient Hebrew period; (c) certain sound shifts may be dated to the post-biblical period, as can be determined from the transcriptions of Hebrew into Greek and Latin; and (d) one cannot be certain that the Greek and Latin transcriptions of Hebrew represent the same reading tradition as the one underlying the Tiberian Masora. The first three of these issues are addressed below, while the fourth one should be kept in mind when relevant.

The picture presented here is further complicated by the fact that several reading traditions of Biblical Hebrew besides the Tiberian one existed at later periods, including the Babylonian (→ Vocalization, Babylonian), Palestinian (→ Vocalization, Palestinian) and Samaritan (→ Samaritan Hebrew: Biblical Hebrew). The Samaritans, who developed as an offshoot of Judaism c. 500 B.C.E., also possess the first five books of the Hebrew Bible (the Torah or Pentateuch) as canonical. They have an independent reading tradition for their Scripture, though in this entry we refrain from entering into these differences.

1. CONSONANTS

At least 29 consonantal phonemes are traceable to Proto-Semitic (comparison with other families in the Afroasiatic phylum suggests the possibility of still other phonemes). The most ancient Hebrew attested retained 25 of these; one local variety of Israelian Hebrew retained one other phoneme; and the remaining three phonemes merged with other phonemes (though one cannot discount the possibility that any or all of these three may have been retained in some restricted geographical locale, lack of evidence notwithstanding; see below §1.13).

As noted above, the Hebrew (Phoenician) alphabet has only 22 signs, so the recovery of the additional three or four phonemes requires special comment (see below for the individual cases). Below I list the consonantal phonemes of ancient Hebrew, grouped according to place and/or manner of articulation. Transliteration is based on the standard system utilized in Semitics. Where the IPA symbol differs, it also is noted. I also present the letter of the alphabet used to render each phoneme.

1.1. *Bilabial plosives*

/p/—פ
/b/—ב

1.2. *Interdentals*

/t/ (IPA [θ]). In virtually all dialects of Hebrew, this phoneme shifted to /s/, indicated by ש (ש). In some Israelian (northern) Hebrew texts, the shift of /t/ > /t/ (ת) may be observed (Rendsburg 2003:10–11). However, in the Hebrew of Transjordan (specifically Gilead), as well as in the neighboring Canaanite dialect of Ammonite, this phoneme was retained. The evidence for this comes from the famous passage in Judg. 12.6, known as the ‘shibboleth incident’ (→ Shibboleth). The story relates how the Gileadites controlled the fords of the Jordan River. When retreating Ephraimites (from Cisjordan) sought to cross, the guards at the fords asked them to pronounce the word *tibbōlet* [tīb̄bōlet], which in Hebrew means ‘stream, torrent’, a fitting password for the crossing of the Jordan River. Since most Israelites did not possess this sound in their phonetic inventory, the Ephraimites would say [sibbōlet], thus revealing the fact that they were not Gileadites (cp. the manner in which various foreign speakers of English [Germans, for example] pronounce English /θ/ as [s], or the manner in which Persians and other non-Arab Muslims pronounce Arabic /θ/ as [s].) Since standard Hebrew (and the dialect of Canaanite for which the alphabet was invented) did not possess this phoneme, there was no special grapheme for representing this sound. In the passage just mentioned, Judg. 12.6, the letter ש (ש) = <š> is used.

For the secondary development of /t/ = [θ] as the fricativized form of /t/, see §2.4. (Note, incidentally, that in my above transcriptions of the Hebrew words underlying the ‘shibboleth incident’, I do not reflect this phonetic shift, which occurred at a later date, since in this instance I have attempted to replicate the pronunciation of Hebrew during the Early Iron Age, the purported setting of Judg. 12.)

On the two remaining interdentals of Proto-Semitic, see §1.13.

1.3. *Dental plosives*

/t/—ת
/d/—ד

/t/—a voiceless emphatic dental plosive, indicated by ט. On the nature of the ‘emphatics’ see §1.14.

1.4. *Nasals*

/m/—מ
/n/—נ

1.5. *Rolled*

/r/—either a rolled dental or a rolled uvular (its exact articulation in ancient Hebrew is unknown), indicated by ר.

1.6. *Sibilants*

/s/—ס
/z/—ז

/s/—a voiceless emphatic sibilant (according to most opinions it is a fricative [cf., e.g., Lipiński 1997:122]; others hold it to be an affricate [see most importantly Steiner 1982]), indicated by צ. On the nature of the ‘emphatics’ see §1.14.

/s/ (IPA [ʃ])—ש. Since this letter represented more than one sound relatively late in the history of Hebrew, a diacritical mark was added by the Masoretes on the right side to produce the grapheme שׁ; see further §2.1.

1.7. *Laterals*

//—ל

/s/ (IPA [ʃ])—ש. For a thorough survey concerning this phoneme, see Steiner 1977. Since the letter ש represented more than one sound relatively late in the history of Hebrew, a diacritical mark was added by the Masoretes on the left side to produce the grapheme שׁ; see further §2.1.

On the one remaining lateral of Proto-Semitic, see §1.13.

1.8. *Velar plosives*

/k/—כ
/g/—ג

/q/—a voiceless emphatic velar plosive, indicated by ק. On the nature of the ‘emphatics’ see §1.14.

1.9. *Velar fricatives*

/h/ (IPA [x])—ח. This sign was also used to represent /h/. We are able to postulate the exist-

tence of both phonemes in the ancient period on the basis of transcriptions of Hebrew words (mainly proper names) in the Septuagint (the ancient Greek translation of the Bible) of the Pentateuch (c. 250 B.C.E.; see Blau 1982). When Proto-Semitic comparisons indicate that the consonant /b/ is present in the Hebrew word, the Septuagint transcription uses χ (see §1.10 for the practice of transcribing /b/). For the eventual merger of /b/ and /b/ see §2.2. For the secondary development of /k/ = [x] as the fricativized form of /k/ see §2.4.

/g/ (IPA [ɣ])— γ . This sign was also used to represent /ʕ/. We are able to postulate the existence of both phonemes in the ancient period on the basis of transcriptions of Hebrew words (mainly proper names) in the Septuagint of the Pentateuch (c. 250 B.C.E.; see Blau 1982). When Proto-Semitic comparisons indicate that the consonant /g/ is present in the Hebrew word, the Septuagint transcription uses γ (see §1.10 for the practice of transcribing /ʕ/). For the eventual merger of /g/ and /ʕ/ see §2.2. For the secondary development of /g/ = [ɣ] as the fricativized form of /g/ see §2.4.

1.10. Pharyngeal fricatives

/ħ/ (IPA [ħ])— η . This sign was also used to represent /ħ/. We are able to postulate the existence of both phonemes in the ancient period on the basis of transcriptions of Hebrew words (mainly proper names) in the Septuagint of the Pentateuch (c. 250 B.C.E.; see Blau 1982). When Proto-Semitic comparisons indicate that the consonant /ħ/ is present in the Hebrew word, the Septuagint transcription shows no consonant (see §1.9 for the practice of transcribing /ħ/). For the eventual merger of /ħ/ and /ħ/ see §2.2.

/ʕ/ (IPA [ʕ])— γ . This sign was also used to represent /g/. We are able to postulate the existence of both phonemes in the ancient period on the basis of transcriptions of Hebrew words (mainly proper names) in the Septuagint of the Pentateuch (c. 250 B.C.E.; see Blau 1982). When Proto-Semitic comparisons indicate that the consonant /ʕ/ is present in the Hebrew word, the Septuagint transcription shows no consonant (see §1.9 for the practice of transcribing /g/). For the eventual merger of /ʕ/ and /g/ see §2.2.

1.11. Laryngeals

/ʔ/ (IPA [ʔ])— \aleph
/h/— η

1.12. Glides (semi-vowels)

/w/— ω
/y/ (IPA [j])— γ

1.13. The remaining Proto-Semitic phonemes

There are three remaining traceable Proto-Semitic phonemes: /d/ (IPA [ð]), /z/ (IPA [ðʰ]), and /d/ (IPA [tʰ]). There is no evidence for the preservation of these sounds in ancient Hebrew. Instead, in most regional dialects of ancient Hebrew, /d/ shifted to /z/ (in some Israelian dialects it shifted to /d/); and both /z/ and /d/ shifted to /s/ (in some Israelian dialects the former shifted to /t/ and the latter shifted to /q/ or later to /ʕ/). At the same time, it must be admitted that any one, two, or three of these phonemes may have been preserved in some locales. But since the Hebrew alphabet lacks special signs to represent these sounds, it is difficult to ascertain if and where such phonemes may have been retained. Were it not for the story in Judg. 12.6 (see §1.2), we would not know that Gileadite Hebrew retained the voiceless interdental /t/, so it is conceivable that elsewhere in ancient Hebrew /d/, /z/ and /d/ persisted. Finally, note that Huehnergard (2003) has posited the existence of yet another proto-Semitic consonant, namely, an emphatic velar fricative /x/ (IPA [xʰ]), though to be sure neither Hebrew nor any other known Semitic language actually attests to this proto-phoneme.

1.14. The nature of the emphatics

The exact nature of the emphatic consonants /t/, /s/, and /q/ cannot be determined. Among Semitic languages still spoken today, the corresponding consonants in Ethiopian and Modern South Arabian are glottalized, while in Arabic they are velarized or pharyngealized. Most likely the glottalization is the original Proto-Semitic manner of articulation (see Aro 1977), so that this can be postulated for ancient Hebrew (for the opposite view see Lipiński 1997:105–106; see also Steiner 1982; → Emphatic Consonants; Affrication).

2. HISTORICAL CHANGES IN THE CONSONANTAL PHONOLOGY

The consonantal phonology described above is correct for Hebrew in its earliest attested phase. But already by the biblical period there is evidence of various changes, and in the post-biblical period still more changes are evident. These historical developments will be presented here.

2.1. *The shift of /s/ to /ʃ/*

In the course of time the voiceless lateral fricative /s/ shifted to a sibilant and merged with /ʃ/. This is indicated by the numerous interchanges between ש (ש) and שׁ in the spelling of ancient Hebrew (see Blau 1970:23–24, 114–125). This tendency is less acute in the pre-exilic (pre-586 B.C.E.) books of the Bible, but becomes more common in the exilic and post-exilic (post-586 B.C.E.) books. Thus, we may conclude that the merger of /s/ and /ʃ/ occurred in Late Biblical Hebrew and continued in still later phases of the language. This shift may be the result of Aramaic influence.

In the centuries after the merger occurred, copyists of the Bible remained faithful to the received text. Accordingly, even though historical /s/ now was pronounced the same as /ʃ/, in the great majority of cases the biblical manuscripts continue to represent this sound with ש (ש). When the Masoretes devised their system of marking all phonetic distinctions in the received text, diacritic marks were invented to distinguish the two sounds represented by ש. With the dot placed over the upper left hand corner, the grapheme שׁ represented the former lateral fricative /s/, now pronounced [s]. With the dot placed over the upper right hand corner, the grapheme שׂ represented /ʃ/.

2.2. *Merger of /b/ and /β/ and merger of /g/ and /ɣ/*

In c. 200 B.C.E., the phoneme /b/ merged with the phoneme /β/, and the phoneme /g/ merged with the phoneme /ɣ/. This can be determined from the following. In the Septuagint of the Pentateuch, accomplished c. 250 B.C.E., these individual phonemes are represented differently in the Greek transcription of proper names and occasional common nouns (see §1.9, §1.10). But in the Septuagint of the other books of the

Bible, which was accomplished several decades or perhaps even a century later, this consistency disappears (see Blau 1982). Accordingly, we can confidently fix this phonological development to c. 200 B.C.E.

2.3. *Weakening of the pharyngeals and laryngeals*

In the preceding paragraph we observed that c. 200 B.C.E. the velar fricatives /b/ and /g/ merged with the corresponding pharyngeals /β/ and /ɣ/. As time passed, there is evidence for an overall weakening of the pronunciation of the pharyngeals and laryngeals, especially in Qumran Hebrew and Rabbinic Hebrew (→ Guttural Consonants). On the one hand, the tradition that yielded the Tiberian Masorah preserved the articulation of these consonants; on the other hand, certain effects of their weakening are discernible in the Masoretic vocalization system. These include: (a) the consonants /b/, /ɣ/, /β/, and /ɣ/ cannot be geminated (this holds for /r/ as well); (b) these consonants cannot be vocalized with simple *shewa*, but instead require an auxiliary vowel; and (c) in final position an anaptyctic vowel is required after a long high vowel (for all except /ɣ/), e.g., /rūh/ > רוּחַ *rūah* ‘wind’.

2.4. *Fricativization (spirantization) of non-emphatic plosives*

At some point in ancient Hebrew, the six non-emphatic plosives, /p/, /b/, /t/, /d/, /k/, /g/, developed a twofold realization. In post-vocalic position they came to be pronounced as fricatives (spirants); otherwise they retained their original plosive character. The corresponding fricative (spirantized) pronunciations are, respectively: /f/, /v/, /t̪/ (IPA [θ]), /d̪/ (IPA [ð]), /k̪/ (IPA [x]), /g̪/ (IPA [ɣ]). Almost without exception, these sounds are allophones. Only in rare instances, due to other factors, did phonemic differences arise. Exactly when the fricativization of the non-emphatic plosives in post-vocalic position occurred cannot be determined, though most scholars date the phenomenon to the 5th century B.C.E., perhaps under Aramaic influence.

Several of these allophones are equivalent to other phonemes in the language. For example, /k̪/ is the same as /b/ (both IPA [x]), and /g̪/ is the same as /g/ (both IPA [ɣ]). Assuming, as

most scholars do, that the fricativization of /k/ to /k̥/ [x] and of /g/ to /g̥/ [ɣ] occurred c. 400 B.C.E., and that /b/ [x] and /g̥/ [ɣ] were still articulated as late as c. 200 B.C.E. (see §2.2), then we may posit the coexistence of two phonemes and their respective phonetically identical (or almost identical) allophones for about two centuries (Blau 1982:74–75). Similarly, the fricativization of /t/ to /t̥/ may have resulted in another such case, if we assume that at the same time at least one Hebrew dialect retained the original phoneme /t/ (see §1.2). Yet there is hardly any confusion between the respective phones (one a phoneme, the other an allophone), thus demonstrating that speakers of a language may possess abstract representations of the relevant sounds beneath the level of surface phonetics (Blau 1982:75).

Clearly the six fricatives under discussion here were pronounced by all (?) Jews c. 800 C.E., when the Tiberian system of the Masora was developed. In time, however, the ability to pronounce some of these sounds was lost by various Jewish communities, especially those in Europe.

The three sounds which remained most stable were /v/, /k̥/, and /f/. Among most European Jews, however, /t̥/ was realized as [s] (compare the ‘shibboleth incident’ described in §1.2, though there is no direct connection between the two phenomena). In the two remaining cases, /g̥/ and /d̥/, fricativization disappeared and /g/ and /d/ were pronounced as [g] and [d] in all environments. On the other hand, some Jewish communities in Arab lands retained most, if not all, of the fricativized allophones into the 20th century. The Jews of Yemen are the best-known example of a community whose pronunciation of Hebrew includes the proper realization of all six allophones. For further discussion see Morag 2007.

2.5. *Velarization of the emphatics*

Above (§1.14) we discussed the nature of the emphatics, with the supposition that they were most likely originally glottalized. Because the corresponding consonants in Arabic are velarized or pharyngealized, and because the majority of Jews in the world c. 1000 C.E. lived in an Arabic-speaking milieu and themselves spoke Arabic as their native language, in time the emphatic consonants in Hebrew became velar-

ized/pharyngealized as well. This pronunciation remains current among the Jewish communities of North Africa and the Middle East. Jews in Europe, on the other hand, lost the ability to pronounce the emphatic consonants altogether. Thus, in time, /t̥/ (ט) > [t], so that it merged with /t/ (ת); /q/ (ק) > [k], so that it merged with /k/ (כ); and /s/ (צ) > [ts], a phoneme common in many European languages, e.g., German (again, see Morag 2007; cf. Steiner 1982; → Affrication).

2.6. *Shift of initial w- > y-*

A standard historical phonological rule is the shift of initial *w-* > *y-*, not only in Hebrew, but throughout Northwest Semitic. Thus, for example, **wašab* > ושב *yāšāb* ‘he sat, he dwelt’, though in non-initial position (as expected based on the rule) the /w/ remains, as in **hawšabti* > הושבתי *hōšabtī* ‘I caused to dwell’ > ‘I settled’ (Lev. 23.43), with the requisite monophthongization *aw* > *ō* (see below, §3.3). The main exception to this rule is the ubiquitous conjunction -ו *w-* (vocalized in different ways) ‘and’.

3. VOWELS

The exact pronunciation of the vowels of ancient Hebrew cannot be recovered. However, we may assume that the classical pattern of Semitic (illustrated best in Classical Arabic) was operative in Hebrew in its earliest historical period. Thus we can reconstruct three basic vowels, short and long: /a/, /i/, /u/, /ā/, /ī/, /ū/. The Masoretic notation system, as noted above, dates to the 8th–9th centuries C.E., and most accurately reflects the pronunciation of Hebrew in the early medieval period. By this time, the classic three-vowel (short or long) system was no longer operative, as many allophones had developed, based on a complex system of syllabification and accentuation. Again, exactly when the shift from a quantitative system of the basic three vowels (short or long) to the qualitative system to be described below occurred is unknown. But it is apposite to quote the view of Jerome (c. 400 C.E.): “It is of no consequence whether [the word Shalem] is pronounced Salem or Salim, because Hebrew very rarely uses vowel letters in the course of words, and according to the discretion of readers

and the different regions the same word is pronounced with different sounds and accents” (Letter ad Evangelum, no. 73 ed. Migne). In other words, there was much local variation in the realization of the vowels. One may wish to compare the situation in colloquial Arabic, where slight changes in vowels are noticeable in its various dialects (for example, the definite article can be [a], [e], [i], [ə], or [l]).

Below we present the vowel system according to the Tiberian Masoretic system. We begin with the long vowels, which are far simpler in their historical development, then move to the short vowels, and conclude with a treatment of the diphthongs.

3.1. Long vowels

Typically, the Proto-Semitic long vowels retain their basic pronunciation in all environments. Thus, /ī/ is almost always [i], and /ū/ is almost always [u]. The only area of real fluctuation is with /ā/. When Semitic cognates indicate /ā/, the Hebrew reflex is /ō/ (→ Canaanite Shift). Thus, for example, Arabic *lā* = Hebrew לָא *lō* ‘no’; Arabic *salām* = Hebrew שָׁלוֹם *šālōm* ‘peace’; etc.

3.2. Short vowels

The above discussion (§3) about the numerous vowel allophones refers most importantly to the short vowels. The Tiberian Masoretic notation system reflects different realizations of the three original vowels /a/, /i/, and /u/, depending on both the accent and the nature of the syllable in which the vowel occurs.

If the short vowel occurs in an accented syllable, or in an unaccented open syllable immediately preceding the accent, the following developments occur (I include here the name of the Hebrew vowel, along with its Tiberian symbol in parentheses):

/a/ > [ā] *qameš* (◌ֶ)
 /i/ > [ē] *šere* (◌ֵ)
 /u/ > [ō] *ḥolem* (◌ֹ)

If the short vowel occurs in an unaccented closed syllable, typically the original pronunciation is not affected, though with two of the vowels there is the possibility of an allophone. Thus:

/a/ > [a] *patah* (◌ַ)
 /i/ > [i] *hiriq* (◌ִ)
 or
 /i/ > [ε] *segol* (◌ֿ)
 /u/ > [u] *šureq* (◌ֻ)
 or
 /u/ > [ā] *qameš* (◌ֶ) (typically called *qameš qatan*)

Different environments usually determine whether /i/ > [ε] as opposed to remaining [i], and whether /u/ > [ā] as opposed to remaining [u]. For example, if the vowel is followed by a geminated consonant, one can expect /i/ > [i], e.g., לִבִּי *libbī* ‘my heart’, and /u/ > [u], e.g., כֻּלָּם *kullām* ‘all of them’ respectively; by contrast witness /i/ > [ε] in לֵב-יָם *leb-yām* ‘heart of the sea’, and /u/ > [ā] in כָּל-אִישׁ *kāl-īš* ‘every man’.

If the short vowel occurs in an open syllable more than one syllable before the accent, then the vowel is reduced to *shewa* [ə] (noted by ◌ֿ). If, however, the consonant involved is a pharyngeal or a laryngeal, then an auxiliary vowel is necessary (often called ‘compound vowel’ due to its orthographic representation in the Masoretic system) (see §2.3). The auxiliary vowel is halfway between a true *shewa* and the corresponding short vowel. Thus one finds the following:

/a/ > [ā] (◌ֶ)
 /i/ > [ē] (◌ֵ)
 /u/ > [ā] (◌ֶ)

We illustrate this whole process with one example. The proto-Hebrew word for ‘word’ is **dabār* (with short /a/ vowels in both syllables, and with the accent mark indicating the stress) > Masoretic דָּבָר *dābār*. The first *ā* occurs because it appears in an unaccented open syllable immediately preceding the accent; while the second *ā* occurs because it appears in an accented syllable. In the expression דְּבַר-יְהוָה *dəbār-yhwh* ‘the word of YHWH’, the two words together have only a single accent, at the end of the divine name. The first /a/ vowel now appears in an unaccented open syllable more than one syllable before the accent, and thus it is reduced to *shewa*. The second /a/ vowel now appears in an unaccented closed syllable and thus is realized as [a].

Note that one Hebrew vowel sign, the *qames* (ֿ), is transliterated as \bar{a} when it derives from an /a/ vowel, but is transliterated as \hat{a} when it derives from an /u/ vowel. In essence, however, the Masoretic notation clearly demonstrates a single pronunciation for this vowel, as an open mid back vowel = IPA [ɔ]. This shows that /a/, when it was accented and when it appeared in an open syllable immediately preceding the accent (see above), was raised to a quality approaching /o/. Such a process is clearly indicated for Phoenician, and was no doubt true of ancient Hebrew as well, at least in the pronunciation tradition which was transmitted by the Tiberian Masoretes. As such, this shift parallels the case of long $\bar{a}l > \bar{o}l$ (see §3.1); and thus we may wish to postulate a general drift in this direction in ancient Hebrew and Phoenician.

It is important to note that the above charting of rules governing the short vowels is not to be taken as hard and fast. As in most languages, also in Hebrew, /a/ is the most stable vowel. When an /i/ vowel or an /u/ vowel is present, the above rules are often violated. For example, $*bur\bar{a}\check{s} > *bur\bar{o}\check{s} > \text{בָּרוֹשׁ } b\bar{a}r\bar{o}\check{s}$ ‘juniper, cypress’ shows reduction of the /u/ vowel to *shewa*, and $*\check{h}im\bar{a}r > *h\bar{i}m\bar{o}r > \text{חִמּוֹר } h\bar{a}m\bar{o}r$ ‘donkey’ shows reduction of the /i/ vowel to composite *shewa* (due to the presence of the pharyngeal /ħ/), even though in both cases the open syllable in which these vowels occur immediately precedes the accented syllable. By contrast, of similar nominal pattern is $*\check{s}al\bar{o}\check{s} > \text{שָׁלוֹשׁ } \check{s}\bar{a}l\bar{o}\check{s}$ ‘three’, with the /a/ vowel retaining its character (though with slight raising to [ɔ], as discussed in the preceding paragraph).

Similarly, auxiliary vowels can arise after consonants which are not pharyngeals or laryngeals. For example, /u/ does not reduce to *shewa* in the word $\text{הַגְּרָנוֹת } hag-g\bar{a}r\bar{a}n\bar{o}t$ ‘the threshing floors’ (1 Sam. 23.1; Joel 2.24); rather it appears as $\bar{a}l = \text{IPA } [ɔ]$. This is due to the circumstance of back vowel /u/ following the velar consonant /g/. Instead of reducing fully to *shewa*, as normally would be expected in the case of an unaccented open syllable more than one syllable before the accent, /u/ retains part of its original quality (i.e., as a back vowel) following a consonant pronounced in the back of the mouth (i.e., the velar /g/) (see Garr 1990:59).

3.3. Diphthongs

Two diphthongs are reconstructed for ancient Hebrew (as in general Semitic) in its earliest stage: *aw* and *ay*. In some cases, mainly in final position, these diphthongs remain unchanged, e.g., $\text{קָו } q\bar{a}w$ ‘line’, $\text{חַי } hay$ ‘alive’ (though with the former note again the raising of the vowel to [ɔ]). Typically, however, one of two changes occurs. The first option is the insertion of an anaptyctic vowel to form two syllables, thus, e.g., $*mawt > \text{מָוֵת } m\bar{a}w\bar{e}t$ ‘death’, $*bayt > \text{בַּיִת } bayit$ ‘house’ (again note the raising of the vowel in the former example), in effect creating something close to a triphthong in each case. The second option is monophthongization, which in Hebrew almost always means $aw > \bar{o}$ and $ay > \bar{e}$, e.g., $*tawr > \text{שׂוֹר } \check{s}\bar{o}r$ ‘bull’, $*bayda > \text{בַּיְצָה } b\bar{e}\check{s}\bar{a}$ ‘egg’. Though in a small number of instances, these two diphthongs monophthongize to $\bar{a} = [ɔ]$, e.g., $*ayn > \text{אֵן } \bar{a}n$ ‘(to) where, until when’ (1 Sam. 10.14; Job 8.2). Examples of this latter process may be localized to two geographical regions in Israel: the northern part of the country (Galilee) and a small pocket in southern Judah (northern Negev) (see Rendsburg 1990).

3.4. Historical changes concerning the vowels

3.4.1. /i/ > /a/ in an originally closed accented syllable

This law is known as Philippi’s Law. An original /i/ vowel shifts to /a/ in an originally closed accented syllable (that is, a syllable that was closed even in its proto-form [as opposed to a closed syllable brought about by some other historical development]) (for further details → Philippi’s Law). Thus, for example, Proto-Semitic $*gint > *gitt$ (via assimilation, see §4.2) > $*git$ (with surrendering of word-final gemination) > $\text{גַּת } gat$ ‘winepress, olivepress’. In Akkadian transcriptions of the city in Canaan by this name (English ‘Gath’), dating to as late as c. 720 B.C.E., the form is still *Gint* (or *Gimt* [with partial dissimilation]). In the Greek translation of the historical and prophetic books c. 200 B.C.E., the form is Γεθ (*Get*), and in the Masoretic text the pronunciation is (as noted above) *gat*. Accordingly, we are able to trace the historical development of this shift, even though the Greek transcription is too equivocal to allow us to pinpoint the exact century

in which Philippi's Law was operative. Further complicating the matter is the fact that the Septuagint and Hexapla reflect a lowering of /i/ > /e/ generally in contexts other than those where the Masoretic pronunciation reflects the /i/ > /a/ shift in accordance with Philippi's Law (→ Transcription into Greek and Latin Script: Pre-Masoretic Period).

3.4.2. /a/ > /i/ in an originally closed unaccented syllable

This law does not have an official name, but it may be called the corollary to Philippi's Law (others prefer the term 'attenuation of /a/'). An original /a/ vowel shifts to /i/ in an originally closed unaccented syllable (again, that is, a syllable that was closed even in its proto-form [as opposed to a closed syllable due to some other historical development]). Thus, for example, **magdal* > מגדל *migdāl* 'tower' (also a toponym 'Migdal'); **šamšōn* > שמשון *šimšōn* 'Samson'; etc. In the Septuagint (3rd century B.C.E.) and the New Testament (1st century C.E.), the Greek renderings of proper names reflect the original /a/ vowel (witness the English forms: Samson, Mary Magdalene, etc.). Jerome (c. 400 C.E.) still has *Magdal* in his Latin translation of the Bible. The Masoretic text reflects the shift to /i/ at some point within the following four and a half centuries. Thus, we may date this shift to sometime between 400 C.E. and 850 C.E.

4. SOUND CHANGES

4.1. Metathesis

The most consistent case of metathesis occurs in the Hitpa'el form of the verb, when the first root consonant is any of the sibilants, /s/, /z/, /š/, /ṣ/, or the lateral fricative /ṣ/. In such cases, the /t/, which forms part of the morphology of this verbal stem and which normally precedes the first root consonant, interchanges with the above consonants, e.g., **wa-ʔišammir* > וַאֲשַׁמְמֵר *wā-ʔēšammēr* 'I guarded myself' (Ps. 18.24).

Other examples of metathesis are the word pairs כֶּבֶשׂ *kebeš* ~ כֶּשֶׁב *kešeb* 'sheep', and שְׂמֵלָה *šimlā* ~ שְׂלֵמָה *šalmā* 'article of clothing', both of which interestingly contain the lateral fricative /ṣ/, with the second set also including

//, a common trigger for metathesis in world languages.

4.2. Assimilation

Anticipatory (so-called 'regressive') assimilation occurs with unvocalized /n/, except before pharyngeals and laryngeals (→ Assimilation: Pre-Modern). Thus, for example, to use an item noted earlier (see §3.4.1), **gint* > **gitt* (eventually shifting to תַּג *gaṭ* 'winepress, olivepress'). Similarly, **yandūr* eventually emerges as יָדָר *yiddōr* 'he vows'. Note also the same phenomenon with vowelless // in various forms of the verb לק"ח *l-q-ḥ* 'take' (e.g., **yilqaḥ* > יִקַּח *yiqqaḥ* 'he takes'), though this particular case is due to analogy with the antonymic verb נת"ן *n-t-n* 'give' (e.g., **yintin* > יִתֵּן *yittēn* 'he gives').

Other examples of anticipatory assimilation involve the dental consonants, e.g., when vowelless /d/ precedes its voiceless counterpart /t/. A regular example is **aḥadt* > אַחַת *'aḥat* 'one' (f.). A unique example occurs in 1 Sam. 4.19: **lalidt* 'to give birth' > **laladt* (via Philippi's Law) > **lalatt* > לָלַת *lālāt* (with surrendering of final gemination); the normal form is לָלַדֶּת *lāledet* 'to give birth', arrived at through different means. In like fashion, vowelless /t/ assimilates to its voiced counterpart /d/ in various Hitpa'el forms, e.g., **mitdabber* > מִדְּבַר *middabbēr* 'conversing'.

Partial lag (so-called 'progressive') assimilation occurs in the Hitpa'el form of the verb, when the first root consonant is /z/ or /ṣ/ and it precedes /t/ (see above §4.1). Examples with /ṣ/ include the following: **niṣṣaddaq* > **niṣtaddaq* > נִצְטַדֵּק *niṣtaddāq* '(how) shall we justify ourselves' (Gen. 44.16); and **biṣṣayyadnū* > **biṣṣayyadnū* > הִצְטַיַּדְנִי *hiṣṣayyadnū* 'we provisioned ourselves' (Josh. 9.12). In both of these, the characteristic /t/ of the Hitpa'el stem shifts to /ṣ/ because of the preceding /ṣ/. No examples with /z/ occur in the Bible, but from post-biblical Hebrew one may cite forms such as **mitzayyip* > **miztayyip* > מִצְדַּיֵּף *mizdayyep* 'is forged' (Tosefta 'Avoda Zara 4.12), in which /t/ shifts to /d/ because of the preceding /z/.

4.3. Elision

Intervocalic /h/ and /y/ frequently elide in Biblical Hebrew, especially in certain morphological

environments. Examples include: **bētahum* > בֵּיתָם *bētām* ‘their (mpl) house’ (with the 3mpl. pronominal suffix); **bā-hab-bayit* > בַּבַּיִת *bab-bayit* ‘in the house’ (with the definite article); **yāḥaqṭil* > יַחַטִּיל *yaqṭil* (paradigmatic form of the Hiph’il prefix-conjugation); **banayū* > בָּנוּ *bānū* ‘they built’ (with the 3mpl suffix-conjugation of ל”י verbs); etc. It should be noted, though, that instances of the non-elision of /h/ or /y/ are attested in Israelian Hebrew (Rendsburg 2003).

4.4. Anaptyxis

The presence of anaptyctic vowels has been noted on several occasions above (see §2.3, §3.3). One further example occurs in the creation of the segholate nouns, e.g., **dalt* ‘door’ > דָּלַת *dālet* (attested in Hebrew in sentence positions requiring a pause, e.g., at the end of a verse) > דֶּלֶת *delet* (reflecting vowel harmony) (→ Segholates: Pre-Modern Hebrew). Greek and Latin transliterations of such words tend to show the forms without anaptyxis, though they do so inconsistently (→ Transcription into Greek and Latin Script: Pre-Masoretic Period). In any case, this development most likely occurred in the 1st millennium C.E.

4.5. Prosthetic vowel

The pronunciation of (potential) initial consonant clusters is assisted by the placement of a prosthetic vowel. The best example is the attestation of both זְרוּעַ *zərōā’* (*passim*) and אֶזְרוּעַ *’ezrōā’* ‘arm’ (Jer. 32.21; Job 31.22), though the latter may be limited to specific regional dialects and/or should be deemed an Aramaism. Another example is אֶצְבַּע *’esbā’* ‘finger’, built from an earlier (albeit unattested) form without initial *’ε-*, as demonstrable from both cognate evidence (cf. Egyptian *ḏb’*) and internal Hebrew evidence (note the denominative verb הִצְבִּיעוּ *ḥašbīū* ‘raise a finger’ [> ‘point’] [Mishna Yoma 2:1]). The cardinal numeral אַרְבַּע *’arba’* ‘four’ (f) also contains a prosthetic vowel (cf. the ordinal form רְבִיעִית *rabīī’it* ‘fourth’ [fem.]), though this is true for all the Semitic languages (cf. Akkadian *erba*, Ugaritic *’rb’*, Sabaic *’rb’*, Arabic *’arba’*, etc.).

5. STRESS

Stress in Hebrew is at times phonemic. Examples include a) בָּאָה *bāā’* ‘she comes’ (fs par-

ticipale, accented on the ultima) vs. בָּאָה *bāā’* ‘she came’ (3fs suffix-conjugation, accented on the penult), both of which are predicated of Rachel in the same story (Gen. 29.6, 9, respectively); b) בָּנוּ *bānū* ‘they built’ Gen. 11.5 (3cpl suffix-conjugation, accented on the ultima) vs. בָּנוּ *bānū* ‘over us’ Gen. 37.8 (preposition *bā-* + 1cpl suffix pronoun *-nū*, accented on the penult); and c) וְאָמַרְתִּי *wā-’āmartī* ‘and I shall say’ Gen. 24.43 (1cs *wāqatal* form, with the accentual shift from the penult to the ultima) vs. וְאָמַרְתִּי *wā-’āmartī* ‘and I said’ Qoh. 9.16 (1cs suffix-conjugation, preceded by conjunctive *wā-*, with no accentual shift).

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