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DIGLOSSIA IN ANCIENT HEBREW AS REVEALED THROUGH COMPOUND VERBS

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There existed in the Hebrew of Greco-Roman times a diglossia which has generally not been recognized. By far the largest number of texts from this period are the rabbinic works such as the Mishna, the Tosefta, and the early Midrashim, which are composed in a Hebrew remarkably different from literary Biblical Hebrew (BH). The language of these texts is called Mishnaic Hebrew (MH), and whereas formerly most scholars considered it an artificial, scholarly language (Geiger 1845; Strack and Siegfried 1884), MH is now universally recognized as the spoken Hebrew of the time (Segal 1927 and 1936; Chomsky 1964:160-8, 208-11, 303-4; Rabin 1970:318; Kutscher 1971b:1590).

A smaller number of texts from this period are the Dead Sea Scrolls (DSS), composed in a Hebrew which is basically the same as BH (Yalon 1967:71; Kutscher 1971a:1584). Thus the Hebrew of Greco-Roman times existed in basically two forms: a spoken dialect represented by MH and a written dialect represented by the Hebrew of the DSS. This statement is not only consonant with linguistic science -- that is, that people speak and write quite differently (Woolbert 1922; Bloomfield 1933:52, 291-2; Joos 1967; Malmstrom 1977:85-6) -- but also makes sense when we take note of the two different literatures.

The DSS are true literary achievements. They include thanksgiving hymns which rival the canonical Psalms, law codes which recall the legalistic language of portions of the Pentateuch, and apocalypses which be-

token the book of Daniel. The Mishna and related works, on the other hand, were not even written originally, but rather were collections of legal sayings and interpretive tales of the Palestinian rabbis. Moreover, when the Mishna etc. were committed to writing, they were recorded in the spoken dialect so that all, even the uneducated, could understand their contents.

The same two dialects are synchronically attested several centuries earlier as well. From the preface of the Greek translation of Ben Sira (Ecclesiasticus), we can infer that the Hebrew original was composed ca. 180 B.C. Ben Sira's contemporaries, Yose ben Yoezer and Yose ben Yohanan (Herford 1962:25), are quoted in one of the earliest portions of the entire Mishna, Avot 1:4-5 (and elsewhere occasionally, e.g., Pesaḥim 1:6, Ketubbot 8:11), where not only their speech but also the speech of their predecessors is unmistakably MH. But the sayings of Ben Sira are couched in BH (Segal 1972:20). Again, whereas Ben Sira set out to write a true literary work and thus used BH, the Mishna merely recorded the sayings of his contemporaries who undoubtedly spoke MH.

It is easily seen that parallel written and spoken dialects of Hebrew coexisted in Greco-Roman times. This same diglossia must also have existed in Biblical times, as will be demonstrated below. Furthermore, since the literary works of Biblical and Greco-Roman times show a marked similarity, there is no reason to believe that the spoken Hebrew of the two periods was distinctively different. And since MH represents the spoken Hebrew of Greco-Roman times, anticipations of MH in the Bible may be used as a guide to the spoken Hebrew of Biblical times.

Anticipations of MH in the Bible are legion. Among the more obvious ones are the use of the personal pronoun אנו /ʔānû/ "we" in Jr 42:6¹ instead of the usual אנחנו /ʔānahñû/; the use of the demonstrative pro-

¹ אנו appears in the written consonantal text. The Masoretes in an attempt to expunge this vulgarity from the text instructed the reader to vocalize it as אנחנו /ʔānahñû/.

noun זז or זה /zô/ or /zô^h/ "this" (fem. sg.) in II Kg 6:19, Ek 40:45, Ho 7:16, Ps 132:12, Qo 2:2, 2:24, 5:15, 5:18, 7:23, 9:13 instead of the usual זה /zô^ht/; and the use of the relative pronoun ש /še/, /ša/, /šā/ "that" or "which" in Gn 6:3, Ju 5:7, 6:17, 7:12, 8:26, II Kg 6:11, Jn 4:10, La 2:15, 4:8, 5:18, I Ch 5:20, 27:27, commonly in Psalms, Canticles, and Qohelet, and in the proper names מְתוּשָׁאֵל /mətûšāʔēl/ "Methusael" and מִישָׁאֵל /mîšāʔēl/ "Mishael" instead of the usual אֲשֶׁר /ʔāšer/.

All of these forms appear regularly in MH to the exclusion of the usual BH forms. They and others like them must have been characteristic of the spoken Hebrew of Biblical times. That the BH forms had not become extinct by Greco-Roman times is evidenced by their attestation in the DSS (Kuhn 1960:20, 24, 63). How such forms as אנו /ʔānû/, זז or זה /zô/ or /zô^h/, and ש /še/, /ša/, or /šā/, crept into the Biblical text was explained by G. R. Driver: "Colloquial expressions are common in all spoken languages and indeed often make their way into literature; and the Old Testament is no exception to the rule..." (Driver 1970:232).




The above examples are all very basic items in Hebrew morphology; indeed they are all pronouns. The diglossia of ancient (i.e., and Greco-Roman) Hebrew can also be demonstrated through more complex forms. One such construction is the compound verb.





Every grammar of BH recognizes the fact that the classical Hebrew verbal system possessed the perfect and the imperfect, the perfect with *waw* consecutive and the imperfect with *waw* consecutive, and the participle. (Forms such as the imperative, the jussive, the cohortative, the construct infinitive, and the absolute infinitive are also recognized but generally they fall outside the scope of this study.)




Grammars of MH are quick to point out that MH lost the perfect with *waw* consecutive and the imperfect with *waw* consecutive (as well as the jussive, the cohortative, and the absolute infinitive), but that it developed a compound verb consisting of the finite part of the verb הִיהָ /hyh/ "to be" (whether perfect, imperfect, or imperative) plus the participle (either active or passive) (Segal 1927:72-3, 150, 156-7; Segal

1936:110-1, 124-5, 130-1; Kutscher 1971b:1600).

What is not commonly recognized is that BH too used compound verbs, to wit, the perfect with *waw* consecutive and the imperfect with *waw* consecutive, or more simply the consecutive tenses. In the former, the finite verb is preceded by the existential particle (or copula) *wa-*, and in the latter, the finite verb is preceded by the existential particle (or copula) *wa-* plus an assimilated consonant (probably *-n-*).



This *wa-* is to be identified with Egyptian  *iw* (Young 1953; Gordon 1957:275-6; Gordon 1965:110-1), "an old verb...with the meaning of the copula ('is', 'are', etc.)" (Gardiner 1957:35). This  *iw* is the most common element in Egyptian in the formation of compound verbs, just as *wa-* is the most common element in Hebrew in the formation of compound verbs.² The assimilated consonant, which converts the normally future imperfect into a past, is perhaps to be identified with the Egyptian  *n*, the indicator of the past tense (Young 1953:252; Gordon 1957:276).³

The analogies between the Hebrew consecutive tenses and the Egyptian evidence go beyond the realms of phonetics and morphology. Syntax too can enter into our discussion. Egyptian  *iw* often is combined with the perfective⁴  *sām-f* to form the  




²This identification may also be recognized in another instance. Both Hebrew *wa-* and Egyptian  *iw* may be used to introduce circumstantial clauses. In the case of Hebrew, it is the regular way to introduce circumstantial clauses. In the case of Egyptian, it is used when the subject is a suffix-pronoun (Gardiner 1957:247; Thacker 1963:168), though in Coptic, circumstantial clauses are regularly introduced by *ε ε* (derived from Egyptian  *iw*) (Till 1970:167-8). Note the similarity between Hebrew *וְהוּא יֹשֵׁב* /*wəhū? yōšēb*/ "as he was sitting" in Gn 18:1 and Egyptian  *iw-f hr mdt* "as he was speaking" in Sinube B:2.


³The assimilated consonant of imperfect with *waw* consecutive may also be identified with Ugaritic *-n* (Gordon 1965:110-1).

⁴Egyptology has adopted the terms "perfective" and "imperfective" while Semitics uses the terms "perfect" and "imperfect". Generally speaking, Egyptian perfective and Semitic (especially West Semitic) perfect correspond, and Egyptian imperfective and Semitic (especially West Semitic) imperfect correspond (Thacker 1963:158).




iw sḏm-f construction. Most interesting is the fact that the addition of the  *iw* converts the perfective  *sḏm-f* used to express past events (Gardiner 1957:287) into a verb which is imperfective in meaning (Gardiner 1957:385). In Hebrew, the addition of *wa-* to a perfect verb does the exact same thing! It causes a verb which normally expresses past tense to express the future tense.

The foregoing may be schematized as follows:

	FORM	TENSE
Hebrew perfect	קָטַל /qāṭal/	past
Egyptian perfective	 <i>sḏm-f</i>	past
Hebrew perfect with prefixed <i>wa-</i>	וַקָּטַל /wəqāṭal/	future
Egyptian perfective with prefixed <i>iw</i>	  <i>iw sḏm-f</i>	future

The other common compound verb in Egyptian, the  *iw sḏm-n-f* form, is the regular past tense form (Gardiner 1957:56). This construction corresponds exactly to the Hebrew imperfect with *waw* consecutive (and assimilated consonant). The phonetic and morphological parallels are easily seen in the following parsing of the two forms:

HEBREW	EGYPTIAN ⁵	PART OF SPEECH
וַ /wa/	 <i>iw</i>	existential particle (or copula)

⁵Whereas the Hebrew compound verb is parsed in the order in which the morphemes appear, it is important to note that the Egyptian compound verb is not, viz.,  *iw sḏm-n-f* not **iw-n-f-sḏm*. The past indicator  *n* does not occur after  *iw* in Egyptian in the sense that **wan-* occurs in Hebrew (or *wn* in Ugaritic).

י /yy/ < *ny



n-f

past tense indicator
and personal pronoun



קטל /qtl/



sām

verb stem

More important is the use of these two analogous compound verbs. The Egyptian is used most often at the beginning of narrative sentences and moreover "gives a certain smoothness and elegance to recitals of past events" (Gardiner 1957:56). The same holds true for the Hebrew form. The imperfect with *waw* consecutive can only be used at the head of a sentence (or clause), and it too gives a certain elegance to story telling. Any speaker of Hebrew will readily realize the difference between ויאמר האיש /wayyômer hāʔîš/ and אמר האיש /ʔāmar hāʔîš/ or איש אמר /hāʔîš ʔāmar/. All three mean exactly the same: "the man said". The only difference is that the first one is reserved for literary style, and the latter two are more colloquial.

The same holds for the perfect with *waw* consecutive. It too can only appear at the beginning of a sentence (or clause) and it also is reserved for the written dialect. There is little question then that the Hebrew consecutive tenses are to be treated as compound verbs. Phonetically, morphologically, syntactically, and stylistically, they are to be identified with the Egyptian compound verbs  *iw sām-f* and  *iw sām-n-f*.

This identification has generally gone unnoticed in Egypto-Semitic studies. As a case in point, we may cite T. W. Thacker's otherwise stimulating article on "Compound Tenses Containing the Verb 'Be' in Semitic and Egyptian". After listing all the various Semitic compound verbs formed by the verb "to be" plus the finite part of another verb, Thacker (1963:164) noted:

...it is interesting to note that Hebrew alone has no compound verb-form consisting of the verb "be" with the perfect or imperfect of another verb. Why this should be is difficult to see, unless the existence of the common idioms ויהי "and it came to pass" and והיה "and it shall come to pass" hindered such a development.

What Thacker failed to realize is that the same verbs which he thought prevented the development of such compound verbs in Hebrew are in actuality the very verbs he thought were lacking. Accordingly, Hebrew, like all the other Semitic languages listed by Thacker, did possess compound verbs consisting of the copula and the finite part of another verb, namely, the perfect with *waw* consecutive and the imperfect with *waw* consecutive.

To back up my suggestion that the Hebrew consecutive tenses were used solely for the written dialect,⁶ we may again turn to the diglossia of Greco-Roman times. In the spoken dialect of the time as represented by MH, these forms are completely absent (Segal 1927:72 and 1936:124). In the written dialect of the time as represented by the Hebrew of the DSS and of certain liturgical pieces, these forms are used (Segal 1927:72 and 1936:124; Kutscher 1971a:1587). The same must have been true during the Biblical period. The written dialect used the consecutive tenses, viz., their regular appearance in BH. The spoken dialect doubtless did not.

What then of the aforementioned compound verbs used in MH? These verbs, which consist of the verb *היה* /hyh/ "to be" and the participle, were used by spoken Hebrew in antiquity. The best evidence for this comes again from the Greco-Roman period. These forms, commonly called progressive tenses because they generally are used "to indicate repeated, usual, concurrent, etc., action" (Kutscher 1971b:1600), are common in MH but practically absent from DSS Hebrew (Kuhn 1960:55, 57-9).⁷

That the progressive tenses were also current in the spoken Hebrew

⁶For the variant views of S. R. Driver, Jacob Milgrom, and Joshua Blau (and my arguments against their opinions), see below.

⁷Progressive pasts are not attested. Except for the cliché which appears in Ml 8:11, 9:1, 9:7, 16:9, 17:15, progressive futures appear five times, in Se 1:18, Ml 2:6-7, 7:12, 8:6, and Dm 4:12. Progressive imperatives are also wanting. These figures do not include the recently published Temple Scroll which reportedly contains several more examples of the progressive tenses (Milgrom 1978:106). (I am unable to cite these examples by verse as a copy of the *editio princeps* [Yadin 1977] has not yet reached me.)

of Biblical times is evidenced by their occasional attestation in BH. The present author has collected 74 examples of progressive tenses in BH.⁸ The following are a few examples of the progressive past:

Gn 39:22	הוא היה עשה /hû? hāyāh ʔôšeḥ/ "he was doing"
Ex. 3:1	משה היה רעה /môšeḥ hāyāh rôʔeh/ "Moses was shepherding"
I Sm 2:11	והנער היה משרה /wəhannaʕar hāyāh məšārēt/ "and the lad was ministering"

The following is an example of the progressive future in BH:

Ne 13:22	יהיו מטהרים /yihyû miṭṭaharîm/ "they will be purifying themselves"
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The following is an example of the progressive imperative in BH:

Ps 30:11	היה עזר לי /hěyēḥ ʔôzēr lî/ "be helping me"
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For those who wish to check the other examples of progressive tenses in

⁸While 74 examples of progressive tenses in BH may seem a large amount, it cannot be considered evidence for the progressive tenses having been characteristic of written Hebrew. Two reasons militate against this: (1) these 74 verbs represent less than 1% of the verbs in BH, and (2) the data from the Greco-Roman period demonstrate that the progressive tenses were used in speech and not in writing.

BH, cf. Gn 37:2, 42:11, 42:31, Lv 13:45 (twice), Nu 14:33, Dt 9:7, 9:22, 9:24, 31:27, Js 5:5, Ju 1:7, 11:10, I Sm 17:34, II Sm 3:6, 6:17, 7:16, 10:5, I Kg 2:45, 5:1, 10:3, 12:6, 18:3, 22:35, II Kg 4:1, 6:8, 9:14, 17:33 (twice), 17:41, 18:4, Is 2:2, 59:2, Jr 14:16, 26:18, 26:20, 32:30, Ek 34:2, 43:6, 46:1, Zc 3:3, 13:1, Ps 10:14, 30:8, 113:2, 122:2, Jb 1:14, 1:21, La 1:1, 1:16, Dn 8:5, 8:7, 10:2, 10:9, Ne 3:26, 5:18, 6:14, 6:19 (twice), 13:5, 13:26, I Ch 17:14, 19:5, II Ch 10:6, 18:34, 22:4, Si 5:13, 18:32, and line 3 of the Yavneh Yam inscription (Gibson 1971:28). As to how these colloquialisms got into the Biblical text, we may again refer to G. R. Driver's (1970:232) quote cited above: "Colloquial expressions are common in all spoken languages and indeed often make their way into literature; and the Old Testament is no exception to the rule..."

The evidence suggests, nay demands, that ancient Hebrew developed two types of compound verbs. The written Hebrew of both Biblical and Greco-Roman times used compound verbs composed of the existential particle (or copula) *wa-* and the perfect or imperfect (with assimilated *-n-*). The spoken Hebrew of both Biblical and Greco-Roman times used compound verbs composed of the inflected copula *היה* /hyh/ and the participle.⁹

Most Hebrew grammarians have been oblivious to this dichotomy. Whereas I treat these compound verb types synchronically, most authors have treated them diachronically. S. R. Driver (1969:170), for example,

⁹A third type of compound verb, which I call "consecutive progressives", also existed in ancient Hebrew. These verbs are actually triple compound verbs composed of (1) the existential particle (or copula) *wa-* or *wa-* plus assimilated *-n-*; (2) the finite part of the verb *היה* /hyh/ "to be"; and (3) the participle. Examples of consecutive progressives are *והיית ממשש* /wehâ-yîta memaššēš/ "and you will grope" in Dt 28:29, and *ואהי צם* /wā?ēhî šām/ "and I fasted" in Ne 1:4. Although many scholars (Bergsträsser 1962:73-4; S. R. Driver 1969:170-1; Segal 1936:131; Thacker 1963:161) lump the consecutive progressives and the simple progressives together, they should be distinguished. The former, like all consecutive tenses, are wanting in MH and thus are to be considered characteristic only of the written dialect.

considered the progressive tenses a late development in Hebrew, though he did recognize the fact that they are used in the early Biblical books. He wrote:

But altogether the more *frequent* use of the combination is characteristic of the later writers -- in the decadence of a language, the older forms are felt to be insufficient, and a craving for greater distinctness manifests itself: the rarer, however, its occurrence in the earlier books, the more carefully it deserves notice.

The above enumeration of Biblical verses, however, shows that the progressive tenses are not much rarer in the early books. Of the 74 examples cited, 21 (or 28%) are from the time of David or earlier (about 34% of the Bible).¹⁰ These figures do not suggest the chronological development which Driver seeks to impart. In fact, these figures show that progressives are only somewhat less frequent in the earlier books of the Bible.

Furthermore, for Driver to be correct in viewing the progressive tenses as a chronological development, the literary works of the Greco-Roman period would have to exhibit as regular a use of the progressives as does the Mishna. We have already seen that such is not the case. To the contrary, progressive tenses are rare in the Hebrew of the DSS (cf. above, fn. 7). Driver's statement, while it may have looked good in 1892 (55 years before the discovery of Qumran), must be discarded in favor of the explanation offered here.

Whereas Driver is excused for his never having reaped the benefit of the DSS, contemporary scholars are not. In discussing the recently published Temple Scroll (the last of the major Qumran documents to be

¹⁰I recognize the pitfalls in using such statistics. The debated dating of virtually every book in the canon makes this arithmetic almost meaningless. On the other hand, no one can deny the general statement presented here: progressive tenses are not much rarer in the earlier portions of the Bible.

published), Jacob Milgrom (1978:106) noted:

The language follows biblical style, but slips of contemporary syntax and idiom betray the scribe. The following examples will suffice: compound verbs with the auxiliary "to be"...

Milgrom implied that such compound verbs are contemporary only with the Qumran scribe and not with the Biblical period. Would he likewise explain the 74 examples of progressive tenses found in BH? This argument may hold for the 71 progressives in the Bible canon and for the two examples in Ben Sira, but it cannot suffice for the one example which occurs in the Yavneh Yam inscription of the 7th Century B.C. (Gibson 1971: 27)!

The opposite approach was chosen by Joshua Blau. Blau (1971:26) concluded that since the standard BH verbal system employs the consecutive tenses וַיִּקְרָא /wayyiqṛā/ and וַיִּקְרָא /wəqāṛa/, we can "assume a similar system in the spoken language". In light of all the evidence presented above, this cannot be the case. From the diglossia of Hebrew in Greco-Roman times -- where consecutive tenses are wanting in the spoken dialect (MH) but are used in the written dialect (DSS Hebrew) -- we can infer the same dichotomy in the Hebrew of Biblical times. Moreover, the comparative Semitic evidence, namely the Egyptian,¹¹ suggests that the consecutive tenses were employed to create an elegant literary style.

Whereas Milgrom's analysis neglected the totality of the Biblical evidence, Blau's analysis neglected the Mishnaic and DSS evidence. Attention to all of the available evidence reveals the following conclusion: *compound verbs of the progressive type were used by spoken Hebrew throughout antiquity and compound verbs of the consecutive type were used by written Hebrew throughout antiquity.*

¹¹For the propriety of calling Egyptian a Semitic language, see the evidence collected by Otto Rössler in his masterly article entitled "Das Ägyptische als semitische Sprache" (Rössler 1971).

REFERENCES

- Bergsträsser, Gotthelf. 1962. *Hebräische Grammatik*. Reprint of 1929 ed. Hildesheim.
- Blau, Joshua. 1971. "Marginalia Semitica II", *Israel Oriental Studies* 1.1-35.
- Bloomfield, Leonard. 1933. *Language*. New York.
- Chomsky, William. 1964. *Hebrew: The Eternal Language*. Philadelphia.
- Driver, G. R. 1970. "Colloquialisms in the Old Testament", in David Cohen (ed.), *Mélanges Marcel Cohen*. The Hague.
- Driver, S. R. 1969. *A Treatise on the Use of the Tenses in Hebrew*. Reprint of 1892 ed. Oxford.
- Gardiner, Alan. 1957. *Egyptian Grammar*. Oxford.
- Geiger, Abraham. 1845. *Lehrbuch zur Sprache der Mischna*. Breslau.
- Gibson, John C. L. 1971. *Textbook of Syrian Semitic Inscriptions*. Vol. 1. Oxford.
- Gordon, Cyrus H. 1957. "Egypto-Semitica", *Rivista degli Studi Orientali (Scritti in Onore di Giuseppe Furlani)* 32.269-77.
- Gordon, Cyrus H. 1965. *Ugaritic Textbook*. Rome.
- Herford, R. Tavers. 1962. *The Ethics of the Talmud: Sayings of the Fathers*. Reprint of 1945 ed. New York.
- Joos, Martin. 1967. *The Five Clocks*. New York.
- Kuhn, Karl Georg. 1960. *Konkordanz zu den Qumrantexten*. Göttingen.
- Kutscher, E. Y. 1971a. "Hebrew Language, The Dead Sea Scrolls", in *Encyclopaedia Judaica*. Vol. 16, pp. 1583-90. Jerusalem.
- Kutscher, E. Y. 1971b. "Hebrew Language, Mishnaic", in *Encyclopaedia Judaica*. Vol. 16, pp. 1590-1607. Jerusalem.
- Malmstrom, Jean. 1977. *Understanding Language*. New York.
- Milgrom, Jacob. 1978. "The Temple Scroll", *Biblical Archaeologist* 41/3.105-20.
- Rabin, Chaim. 1970. "Hebrew", in *Current Trends in Linguistics*. Vol. 6. The Hague.
- Rössler, Otto. 1971. "Das Ägyptische als semitische Sprache", in Franz Altheim and Ruth Stiehl (eds.), *Christentum am roten Meer*. Vol. 1. Berlin.
- Segal, Moshe Zvi (M. H.). 1927. *A Grammar of Mishnaic Hebrew*. Oxford.
- Segal, Moshe Zvi (M. H.). 1936. *Diqduq Lešon ha-Mišna*. Tel-Aviv.
- Segal, Moshe Zvi (M. H.). 1972. *Sefer Ben Sira ha-Šalem*. Jerusalem.
- Strack, Hermann L. and Siegfried, Carl. 1884. *Lehrbuch der neuhebräischen Sprache*. Karlsruhe.
- Thacker, T. W. 1963. "Compound Tenses Containing the Verb 'Be' in Semitic and Egyptian", in D. Winston Thomas and W. D. McHardy (eds.), *Hebrew and Semitic Studies Presented to Godfrey Rolles Driver*. Oxford.
- Till, Walter C. 1970. *Koptische Grammatik*. Leipzig.
- Woolbert, C. H. 1922. "Speaking and Writing -- A Study of Differences", *Quarterly Journal of Speech Education* 8.271-85.

- Yadin, Yigael. 1977. *Megillat ha-Miqdaš*. Jerusalem.
Yalon, Hanoah. 1967. *Megillot Midbar Yehuda: Divre Lašon*. Jerusalem.
Young, G. Douglas. 1953. "The Origin of the Waw Conversive", *Journal of Near Eastern Studies* 12.248-52.

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