

**A GRAMMAR OF THE BIBLICAL ACCENTS**

**A thesis presented**

**by**

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## ABSTRACT

The Masoretic "accents" group the words of the Biblical text for recitation. This accentual grouping, though rigid and stylized, is functionally equivalent to the intonational phrasing of ordinary utterance.

Ordered rules derive the accentuation of each verse from a parsing that marks not only kinds of syntactic relations but also degrees of syntactic closeness. Phrasing rules (similar to Chomsky and Halle's "readjustment rules") operate on this parsing, "flattening" long and/or complex syntactic components and "adjudicating" among the conflicting claims of contiguous components to closeness with each other. "Cadencing" rules then combine or further divide the readjusted components according to their distance from verse-end. These two sets of rules determine, for any given word, 1) whether it bears its own accent or depends on a contiguous word; 2) whether it bears a conjunctive or disjunctive accent; 3) which disjunctive accent it bears (conjunctives are then predictable from disjunctives).

The systematic relation between syntax and intonation implicit in Masoretic Hebrew has not been fully recognized before because of 1) the adherence, in Bible studies, to a view of the accents as an artificial Masoretic device governed by a "law of continuous dichotomy"; 2) the lack, in linguistics, of an adequate theory of the relation between syntax and intonation for language in general.

To my mother and father

## ACKNOWLEDGMENTS

I learned how to chant the Biblical text according to the Masoretic accents from my friend Jane Myers, composer and singer of beautiful and delicate psalm-melodies. Her interest in the relation between the accents and the meaning of the text was the first stimulus for the investigations which resulted in this dissertation. Another friend, Rabbi Ben-Zion Gold, director of Harvard-Radcliffe Hillel, taught me Torah and provided a setting in which all kinds of inquiry into the Bible could flourish.

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My wife, Patricia Herzog, encouraged me to commit myself to this project. In the long process of bringing it to completion, I have received from her not only the support of a helpmeet but also the insightful comments of a philosopher.

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## PREFACE

In the course of this study, I will be making frequent reference to the Hebrew Bible and to a treatise by William Wickes on the Biblical accents. In order to avoid repetitiousness in bibliographical citation, I shall state here what these works are and how I shall be referring to them.

Biblia Hebraica Stuttgartensia. Stuttgart: Deutsche Bibelstiftung, 1967/77.

All mentions of "the Bible", "the Hebrew Bible", "the Masoretic text" and the like can be taken as referring to this work, though, as a practical matter, any edition of the Hebrew Bible will do, since whatever differences there may be among various available editions do not affect what I have to say about the Biblical accents.

Wickes, William. A Treatise on the Accentuation of the Twenty-one So-called Prose Books of the Old Testament. Oxford: Clarendon Press, 1887.

All mentions of "Wickes" refer to this work. It is most readily found in a re-publication entitled Two Treatises on the Accentuation of the Old Testament (New York: Ktav Publishing House, 1970). The treatise with

which I am particularly concerned is the second of the two. (N.B. In this republication, pages 32 and 33 of the second treatise have been erroneously interchanged with pages 32 and 33 of the first.)

It will also be convenient to use the following abbreviations for standard works that are referred to in the course of this study:

Lambdin    Lambdin, Thomas O. Introduction to Biblical Hebrew. New York: Charles Scribner's Sons, 1971.

RSV        The New Oxford Annotated Bible with the Apocrypha (Revised Standard Version). Ed. Herbert G. May and Bruce M. Metzger. New York: Oxford University Press, 1977.

SPE        Chomsky, Noam and Morris Halle. The Sound Pattern of English. New York: Harper and Row, 1968.

The basis for my transliterations from Biblical Hebrew is the system set forth in Lambdin. For reasons of typographical convenience, I depart from that system in the following ways:

1) For the vowel that is normally transliterated with the symbol ə , I use ě . Although ě is also used to represent ḥāṭēp sēgāl (as in the word ělōhîm), confusion is not likely, since context makes clear which vowel is intended.

2) I do not mark the distinction between the stops and their spirantized counterparts (e.g., between b and b ) except when that distinction is not predictable from phonological context or when it is specifically under discussion (as on p.6).

## Chapter I: INTRODUCTION

### 1. Accentuation as part of the Masorah

The Masoretic text of the Hebrew Bible, i.e., the received text, may be regarded as having two components: the written "consonantal" text, fixed in its present form somewhat less than two thousand years ago; and the supplementary Masorah, i.e., "tradition", originally oral, but eventually reduced to notation and fixed in its present form about a thousand years ago. The orthographic devices of the consonantal text are: 1) twenty-two letters, which are basically consonantal and leave most vowels unspecified; 2) spaces between groups of letters to indicate the boundaries between words; 3) occasional larger spaces between groups of words to indicate, but unsystematically and rather rarely, a kind of paragraphing. Taken by itself, the consonantal text of the Bible is quite deficient as a guide for recitation and comprehension, if compared, say, to any ordinary English text, with its vowel as well as consonant graphemes, its punctuation marks, and its distinction between upper and lower case letters. The function of the Masorah is to compensate for the deficiencies of the consonantal text.

The Masorah consists chiefly of two sets of graphemes, generally called vocalization and accentuation. Masoretic vowel graphemes are commonly and readily transcribed into

universal linguistic symbols, which is another way of saying that the vowel system which they represent is well understood. The function of Masoretic vocalization and its indispensability for the study of Biblical Hebrew grammar may, for the purposes of this study, be considered obvious and in need of no further explanation.

Masoretic accents crowd the page of printed Bibles almost as much as Masoretic vowels, and with even greater variety. In the twenty-one so-called "prose books" (i.e., all of the canonical Hebrew Bible except Job, Proverbs and Psalms) there are twenty-six different accent graphemes. An accent is found above or below every word of the Biblical text except those which are proclitic or enclitic. (Proclitic and enclitic words are attached, by means of the hyphen-like grapheme maqqep, to the words on which they depend for their stress.)

See section 7 of chapter II, sections 1.12 and 4 of chapter III for more on unstressed words.

Unlike the vocalization, however, Masoretic accentuation has not been well understood. It has not been clear what sort of system it is, nor to what it corresponds in the categories by which languages are generally annotated and described. Even the term "accentuation" is, as will soon emerge, something of a misnomer (though I shall continue to use it). My aim in this study is to explain what the so-called accentuation of the Hebrew Bible is and how it works.

Actually, I shall be confining my inquiry to the twenty-one books and not looking at the three so-called "poetical books", which use a different set of accent graphemes. Partly I am imposing this limitation in order to keep my study simple; partly also because others have done so. But there is another deeper and more intrinsic reason which I will explain below, when it is appropriate to my exposition (p.11).

## 2. The functions of the accents variously considered

The accents are generally considered to serve three distinct functions, indicating:

- 1) cantillation -- how a word is to be chanted;
- 2) stress -- which syllable bears the stress;
- 3) punctuation -- how a word is to be grouped with or separated from other words that follow and precede, so that the sense of its relations with those words will be clear.

The first of these accentual functions has for the most part been a concern only for those who are involved with the public recitation of Biblical Hebrew texts in religious services. For them, each accent represents a melodic motif, the correct way to chant the word.

The second function is important for public chanters, too, since the principal contours of the melodic motif, including its highest pitch, must be executed on the stressed syllable of the word. The importance of this accentual function also extends to anyone who wants to

pronounce Biblical Hebrew words correctly: all linguistic descriptions of Biblical Hebrew rely on the Masoretic accents as indicators of stress. If this were the only function of the accents, the existence of twenty-six different accent graphemes would be a puzzle, since one might well suffice to do the job. Nevertheless, it is this function of the accents which most clearly justifies the use of the English term "accent" (and its cognates in other European languages).

The Masoretic term *ta'am*, which the word "accent" translates, is used quite differently, however. Concretely, it means "flavor" or "taste"; more abstractly, it means "sense", "import", "meaning in a particular context." The term *ta'am* seems most fitting for the third generally perceived function: the accents, or *te'amim*, help to give the sense of a word by indicating how it is related to and grouped with other words of the verse. A conjunctive accent indicates that its word is to be grouped with the word that follows. A disjunctive accent indicates that its word is, in some degree, to be disjoined from the word that follows. The disjunctive accents can be divided into several categories and called "heavy" or "light" according to the degree of disjunction which they indicate.

In this punctuational function, the accents, or at least the disjunctive ones, are generally regarded as corresponding to the punctuation marks of more recent written languages. In fact, it often happens that the punctuation

marks in a translation of a Biblical verse correspond quite exactly to some of the disjunctive accents of the Masoretic text. Here for example is a transliteration of Gen. 12.4 along with the RSV translation of it:

wayyēlek 'abrām ka'āser dibbēr 'ēlāw yhw̄h  
 wayyēlek 'ittō lōt  
 wē'abrām ben-hāmēš šānīm wēšib'im sārāh  
 bēšē'tō mēhārān

So Abram went, as the LORD had told him;  
 and Lot went with him.  
 Abram was seventy-five years old  
 when he departed from Haran.

The ends of the two principal syntactic groupings are indicated by periods in the translation, and in the Hebrew by the two heaviest disjunctive accents 'atrāh ( אַ ) and sóp pāsúq ( , ֿ ). In the first half of the verse, the semi-colon and the comma correspond respectively to zāqēp qāṭōn ( אֲ ), the heaviest disjunctive within the first half-verse, and to rēbīa' ( אֲ ), the next heaviest disjunctive.

Note that there are no punctuation marks in the translation to correspond to the conjunctive accents ( אֲ ) and the lighter disjunctive accents ( אֲ ) of the first half-verse. Note also, and perhaps with greater perplexity, that the very same disjunctives to which semi-colon and comma correspond in the first half-verse occur also in the second half-verse with no corresponding punctuation marks in the English. (See the discussion of punctuation in section 5 of this chapter.)



In connection with this third, punctuational, function of the accents, it seems appropriate to mention briefly here that the accents are also involved as necessary conditions for non-accentual Masoretic notations of sandhi and of pause. Thus, the alteration of a word-initial consonant to indicate sandhi with the preceding word occurs only when that preceding word bears a conjunctive accent, e.g.:

šim'û bēqôlî "Listen to my voice" (Jer.11.4)  
 šim'û bēqôlî "Listen to my voice" (Jer.11.7)

See chapter II, section 7 for an understanding of where sandhi phenomena fit into a grammar of Biblical accentuation.

And the altered vocalizations of "pausal forms" occurs obligatorily with the heaviest disjunctive accents, e.g.:

zāhāb wākesep "gold and silver" (Ezek.16.13)  
 zāhāb wākāsep "gold and silver" (I Chron.29.3)

(kesep is the "normal" form of the word for "silver", and kāsep is the pausal form, which occurs obligatorily with the accent 'atnāḥ.) Most of the Masoretic alterations of vowels and consonants to indicate pause can, like the examples given in this paragraph, be viewed simply as reflex concomitants of certain accents.

### 3. An integrated theory of the accents

Scholars of the Biblical accents have regarded the three accentual functions discussed above (cantillation, stress and punctuation) as distinct from each other. They have not been able to formulate their inter-relationship in a linguistically systematic way; the fact that these three functions are combined in the accents has seemed more or less arbitrary. One reason for this may be that scholars have been pre-occupied with the question of which of the accentual functions is the historically primary one. This question has not been resolved; perhaps its premise -- that one of the functions is chronologically prior to the others -- is false. In any case, preoccupation with this question has not contributed to a synchronically unified view of the workings of the accents.

A second, more interesting, reason may be that Masoretic accentuation, apart from its roles in marking stressed syllables and in conditioning sandhi and pausal forms, can easily seem to be outside the purview of grammarians and linguists. It may seem to be a non-linguistic and/or highly artificial set of devices which they are not obliged to try to integrate into a theory of the grammar of Biblical Hebrew. It thus appears to differ greatly from Masoretic vocalization, the graphemes of which are clearly intended to represent a kind of phenomenon -- distinct vowel timbres -- which everyone agrees is involved

in the articulation and perception of meaningful linguistic utterance. (This is quite apart from the question of what the actual vowel system of any particular period of ancient Hebrew was and whether the Masoretic notation fairly portrays it.)

For, aside from stress, what sort of meaningful speech sound could Masoretic accentuation represent? Cantillation is generally and plausibly regarded as a subject for music-books rather than for grammars. If that is so, then the sounds which the accents (qā cantillation) represent are not linguistic sounds. One might then go on to infer that the syntactic information which the accents (qā punctuation) represent is not conveyed linguistically (i.e., through utterance), but in some other, non-linguistic, way. Such an inference seems to draw support from other observations about Masoretic accentuation. A complex method of grouping words that uses twenty-six different punctuation marks, one of which is applied to every word, certainly has the appearance of something artificial: a system devised, perhaps, for slow and static exegesis of sacred texts. It seems to have little to do with "natural" language, with the dynamic communication between speaker and hearer (or between normal text and normal reader) for which linguistic systems must be suited and by which they are constrained.

This presumption is an important part of the prevailing theory of Masoretic accentuation -- Wickes'

theory of continuous dichotomy, about which I will have a good deal to say below (especially in chapter IV). According to this theory, the accentuation of each verse is essentially a diagram. The diagram tells the reader how the verse is divided in two (at the point of the heaviest disjunctive accents), how the results of that division and all subsequent divisions are continuously divided by decreasingly heavy accents until the ultimate result is a hierarchical arrangement of small groups of words (generally not more than two or three words in a group). His theory offers a reasonably clear, though often not insightful, method for analyzing Biblical verses according to their accents, but it makes sense only if we assume that the accents are intended for the student who can sit and analyze each verse with pencil and paper.

Wickes did not address the question of how accents might convey information to the listening ear or to the eye moving in linear motion. It is a fact that the accents, like the vowel signs, are an integral part of the words of the Masoretic text. The diagrams which (according to Wickes' theory) the accents provide, are, on the contrary, like glosses in the margin: the reader is to consult them before or after reading the verse; they cannot be an integral part of the reading. Wickes' theory does not presume that the accents, like their sister graphemes, the vowels, were devised with the normal graphemic purpose of insuring correct understanding by means of correct

utterance of the words of the text. "It was a peculiar system," wrote Wickes (p.30), "but one that must have answered its purpose."

In my work on Masoretic accentuation, I proceed from a different hypothesis: that the apparently disparate functions of the Masoretic accents constitute an integrated system with a unified purpose, and that, in essence, neither the system nor the purpose is linguistically "peculiar". I assume that the Masoretes intended the accents to help convey the sense of the text, not abstractly but through utterance.

I will be occupied during most of this study with working out this assumption and attempting to prove its usefulness; I am not now setting it forth as self-evident. I can, however, even at this point, offer the experiential background of my assumption. It is my observation that, for anyone with even a limited knowledge of Biblical Hebrew who listens to public reading of the Biblical text, recitation according to the accents makes the text more comprehensible. Furthermore, the listener needs no extra information in order to benefit from the accents in this way, nor does he need any preparation or technique; he does not need to learn to appreciate the effect of the accents. (He does not, for example, need to be able to hold an entire verse in his head so that he can see how it can be understood as dichotomy within dichotomy within dichotomy...) Recitation according to the accents makes

the meaning of the Biblical text clear the way well-modulated reading, with pauses in the right places, makes any text clear.

The "experiential background" of my theory has a lot to do with the decision to limit this study to the accentuation of the twenty-one books (see p.3). There can be no such experience of the accentuation of the Job, Proverbs and Psalms, because there is no extant tradition of reciting them according to the accents. I can try in this study to make explicit my intuitions about the recitation of the twenty-one books, i.e., my ability to predict the accentuation. I have no such intuitions about the recitation of the other three.

If my theory that the accents help convey the sense of the text not abstractly but through utterance is correct, then, in this respect, the accents function as our familiar punctuation marks do. Commas, semi-colons, etc. do not give the reader information that is somehow separate from utterance of the text in which they are found; rather, they suggest the intonation contours by which the words of the text should be grouped in utterance, so that the relations among the words, and hence the meaning of the text as a whole, will be clear. In my view, Masoretic accentuation is a system for representing this intonational aspect of the correct recitation of the Biblical text.

Syntactic grouping is, I propose, the basis and point of departure for the distribution of the intonation contours which the Masoretic accents represent. Two of the apparently disparate functions of the accents (cantillation and punctuation) are, by this view, united in a

linguistically normal way. Punctuation marks normally represent intonation contours, which derive in great part from the syntactic grouping of an utterance; similarly, the accents represent cantillational (recitational) motifs, which reflect the syntactic grouping of the text.

I have already suggested the way in which the third function is integrated with the others when I noted (p.3) that a cantillation motif, and especially its highest pitch, must be chiefly executed on the stressed syllable of the word; for this is, of course, true of ordinary intonation contours, too.

I therefore hold that the three functions generally attributed to Masoretic accentuation are inter-related in a way that one might well expect if the Masoretes' purpose was, in fact, to indicate by their annotations how the meaning of the Biblical text should be conveyed through normal human utterance; or, rather, through a heightened and stylized form of normal human utterance -- recitation.

#### 4. Difficulties in the way of an integrated theory

The theory of the accents that I have offered in section 3 integrates the three functions of the accents, and it integrates accentuation as a whole into the grammar of Biblical Hebrew. It thus does a job that theories are

supposed to do: it explains and justifies what would otherwise seem arbitrary or superfluous.

Why has there not been, before now, any such integrated theory of the accentual functions? And, if the accents really do represent the intonation contours that are a recognized part of linguistic communication, why has Masoretic accentuation not been fully integrated into study of the grammar of Biblical Hebrew? At the beginning of section 3, I suggested two reasons that are extrinsic to the actual workings of the accents: 1) scholarly preoccupation with the historical priority of one function or another; 2) the artificial and non-linguistic appearance of the accentuation, which does not seem to look or function like other graphemic systems with which grammarians and linguists are familiar.

The chief difficulties for an integrated linguistic theory of the accents are not extrinsic, however. They are inherent in a general misunderstanding or incomplete understanding of the terms of the propositions upon which such a theory can be constructed. The component propositions of my theory may appear acceptable; they may even be generally accepted. But they will not support the structure that I want to build upon them unless their terms are, so to speak, properly aligned. A review of these propositions is called for, and a closer examination of their terms.



The building blocks of my theory, re-stated separately and simply, are as follows:

(propositions derived from Masorah studies)

- (1) Accents indicate cantillation.
- (2) Accents indicate stressed syllables.
- (3) Accents indicate punctuation; i.e., they function as punctuation marks do, grouping words to help convey sense.

(propositions derived from general language study)

- (4) Punctuation marks represent intonation contours.
- (5) Intonation contours group the words of an utterance to help convey its sense.

(propositions derived from experience of Biblical recitation)

- (6) Cantillation motifs group the words of the Biblical text in recitation and help convey its sense.
- (7) The highest note and the "downbeat" of a cantillation motif occur on the stressed syllable of the word.

My inferences from these propositions, also re-stated separately and simply, are as follows:

(8) #2 is included in #1. This I infer from #7.

In other words, the fact that the accents indicate stressed syllables (proposition #2) is already implicit in the fact that the accents indicate cantillation (#1).

(9) Cantillation motifs are functionally equivalent to intonation contours. This I infer from #5 and #6, and from the assumption that a recitation of text is a kind of utterance.

Both intonation contours and cantillation motifs group words to help convey sense. They are therefore functionally equivalent.

(10) #1 and #3 are equivalent. This I infer from #4 and #9.

The fact that the accents function as punctuation marks (#3) implies (by #4) that the accents represent intonation contours. The fact that the accents represent cantillation (#1) also implies (by #9) that they represent intonation contours. In other words, both #1 and #3 imply that the accents represent intonation contours. #1 and #3 are therefore equivalent.

Thus, Masoretic accents represent intonation contours by which the words of the Biblical text are to be grouped in recitation to help convey the sense of the text. It

seems reasonable to suppose that this representation of intonation in order to convey sense is the purpose of the accents, and that this purpose explains and unifies the three functions generally attributed to the accents.

My theory of Masoretic accentuation, just re-stated in the preceding paragraph, is not the prevailing view, despite the fact that it seems to follow from the generally accepted propositions listed above. Misunderstanding (or incomplete understanding) of terms used in those propositions has perhaps impeded the emergence of an integrated theory such as I am expounding. In particular, the following expressions present difficulties:

- (a) "cantillation" (#1)
- (b) "punctuation" (#3)
- (c) "grouping words to help convey sense" (#3, #5, #6)

The whole of the next chapter will be devoted to the third expression. It bears on the question of what and how the accents signify. In the remainder of this chapter (i.e., in section 5), I shall be occupied with trying to clarify the first two of these expressions. They bear on the question of what kinds of signs the accents are or represent.

## 5. The accents as linguistic signs

The proposition (#1 above) that the accents indicate cantillation means that the accents represent cantillation motifs. In this statement, the accents are described as written signs that represent uttered signs.

The proposition (#3 above) that the accents indicate punctuation uses the term "indicate" in a different way. This statement means that the accents are functionally equivalent to punctuation marks. Here the accents are described as written signs that are functionally equivalent to other written signs.

By my theory of the accents the two statements have the same import. Both ultimately mean that the accents represent intonation contours. This is so for the first statement if the cantillation motifs that the accents represent are themselves functionally equivalent to intonation contours. It is so for the second statement if the punctuation marks to which the accents are functionally equivalent are themselves representations of intonation contours. My claim that the two statements ultimately mean the same thing thus depends on the way I understand "cantillation" and "punctuation." But my understanding of these terms is not necessarily the prevailing one.

My theory assumes that cantillation motifs (or, more precisely, sequences of cantillation motifs) are functionally equivalent to the intonation contours of

speech. It might be objected, firstly, that cantillation is music, not language. I am instead regarding it as a mode of speaking -- stylized, amplified, elevated, fixed rather than spontaneous, but speech nonetheless. This would be a surprising view if the cantillation had any musical life or logic of its own, but the cantillation is, in fact, tied accent by accent to the words and word-groupings of the text. It is recitation, not song. The notion that cantillation is a subject for music-books rather than grammar-books may seem to have a certain plausibility, since cantillation involves sustained and distinct pitches, more characteristic of music than of speech. Functionally, however, this notion is quite misleading.

Quite apart from questions of Biblical Hebrew and its accentuation, the fact is that even ordinary, "uncantillated", intonation contours have not, in general, been comfortably regarded as a subject for grammar-books, either, despite their undoubted capacity for conveying linguistic meaning.

It might also be objected that I have no business assuming that the cantillation motifs represented by the accents function like intonation contours, since I can have no knowledge of the actual intonation contours or cantillation motifs that the Masoretes heard or had in mind. In my opinion, however, our understanding of how Masoretic accentuation works as a system is compromised by our lack of that sort of knowledge only about as much as

our understanding of Masoretic vocalization is compromised by our inability to determine absolutely how Biblical Hebrew was in fact pronounced at any given period.

Another way of answering this second objection is to note that: 1) the melodic motifs presently in use for cantillation of the Hebrew Bible vary from one Jewish community to another; 2) even within a community, the mode of chanting varies according to which part of the Bible is being read and according to the occasion on which the reading is taking place. Despite these variations, cantillational patterns corresponding to the Masoretic accents serve as a guide to comprehension of the text wherever and whenever Biblical Hebrew is recited and understood. Unless we think that the basic human capacity to use intonation to clarify or reinforce sense has changed in the past thousand years, there is no reason to retreat from hypothesizing that the Masoretic accents have always served to represent intonation contours.

My theory also assumes a certain understanding of the term "punctuation". Now, insofar as a linguist ever thinks about phenomena as remote from the speech act as punctuation marks, he is likely to realize, having some experience of transcribing live spoken language, that they mark the ends of intonation contours. But the scholar who is occupied only with written texts can easily become accustomed to thinking of punctuation marks as simply dividing one group of words from another, with no thought



there should be three additional disjunctives in the first clause ( ) , two more in the second clause ( ) and one more in the third clause ( ). "We naturally ask, what was the purpose designed by this remarkable process of division and minute sub-division?" wrote Wickes (pp.34-35). "No doubt it served to mark the logical and syntactical interpunction. But...it was not needed to anything like the extent to which it was applied. Some other explanation therefore is necessary..."

The explanation (not at all the same as Wickes') that my theory of accent distribution will provide, is that accentual sequences are word-by-word prescriptions for intonation contours (i.e., sequences of cantillation motifs) which more familiar punctuation marks (like the commas and period in the above translation) imply simply by marking their end-points.

This explanation is not conceivable without the understanding that: 1) cantillation is functionally equivalent to intonation; 2) punctuation marks are not diagrammatic comments superimposed on a text, but are rather representations of the intonational aspect of the utterance of the text. Incorrect or incomplete understanding of "cantillation" and "punctuation" has allowed a non-linguistic theory of the accents to prevail, one which separates sound from meaning. By this prevailing theory, the accents as cantillation marks provide music, i.e., sound without linguistic meaning; the accents as



punctuation marks provide meaning that is not conveyed through utterance, i.e., meaning without linguistic sound.

By my theory, cantillation marks and punctuation marks are the same. Whether viewed as the one or as the other, the accents represent sounds that systematically convey meanings. In other words, by my theory, the accents are written representations of linguistic signs.

## Chapter II: GROUPING

(How accentual word-groupings help convey sense)

### 1. The uses of intonation

The sounds that accents (functionally equivalent to punctuation marks) represent are cantillation motifs (functionally equivalent to intonation contours).

Intonation contours are linguistic signs that group the words of an utterance to help convey its sense. But is that all they normally do?

The use of intonation contours (and the punctuation marks which represent them) is not ordinarily confined to the grouping of words. What distinguishes an exclamation point from a period, for example, has to do not with the grouping of the uttered words but with the speaker's attitude toward them. The attitudinal uses of intonation contours (most of them lacking any conventional graphemic representation) are, in fact, so multifarious and so intertwined with other complicating factors --like manner and context -- that, for practical as well as theoretical reasons, most of them are relegated in linguistic descriptions to the realm of "performance". If attitude were a very significant factor in the distribution of the Masoretic accents, it might well be impossible to study them as a grammatical phenomenon.

Attitude (or expressivity) does in fact enter into Masoretic accentuation, but only peripherally and without affecting the overall system. There are three accents which occur very rarely as expressive variants in place of the accents that would normally be expected. They are much more unusual than underlining (or italicization) is likely to be in an English literary text, but their effect is similar. For example, Lev.10.1-2 might well be translated as follows:

Now Nadab and Abihu...offered strange fire before the LORD, which He had not commanded them. And fire came forth from the LORD and devoured them and they died...

The underlining corresponds to the presence of the accent *mereka' kepulah*, which occurs only a few times in the whole of the Bible. Its purpose in this instance -- if, indeed, it has a purpose, and is not simply a scribal error hallowed by tradition -- seems to be to emphasize a little word that is felt as crucial to the reader's or listener's comprehension of the swiftness and severity of the divine punishment of Nadab and Abihu. If so, this special accent conveys part of the meaning of this text. But the occurrences of this and other "expressive" accents are so infrequent, irregular and unpredictable, that they are probably best appreciated by being listed rather than by being theorized about. No such list will be offered here, however. Signifying attitude is an extremely

marginal function of the Biblical accents; I will not give it any further attention in this study.

For speech in general, the expressive and attitudinal uses of intonation contours are not marginal. Nevertheless, as I have already said, those uses are not, for practical as well as theoretical reasons, ordinarily considered to belong to the study of grammar. There are uses of intonation contours to group words which do, however, unquestionably belong. These cannot be excluded from studies of linguistic "competence"; they must be considered as part of the output of a grammar. For example, the difference between the intonation (in English) of

Moses gave the Torah to the Levites,  
who carry the ark.

and of the same sentence without the comma (i.e., the difference between non-restrictive and restrictive relative clauses) is one for which a grammarian or linguist must account. Likewise, the difference between the intonation of

God spoke to Moses, and Aaron  
and the elders stood further down the mountain.

and of the same sentence with the comma after "Aaron" instead of after "Moses" (the difference between "Aaron" as the indirect object of one clause and "Aaron" as the

subject of another) is clearly a matter of linguistic competence.

In the above examples, English punctuation marks (and the intonation contours that they represent) group words to help convey sense. They reflect syntactic grouping.

## 2. Kinds of accentual grouping

Masoretic accents also reflect syntactic grouping. It is the basis and point of departure for their distribution. By "distribution" I mean a systematic procedure which determines how the Biblical text is to be accentuated (i.e., intoned). My hypothesis is that there is such a procedure and that it operates on underlying syntactic structures. Insofar as the accentual word-grouping of a Biblical verse appears to be a direct reflection of underlying syntactic grouping, it, too, may, for convenience, be called syntactic grouping. That it helps convey sense is self-evident: it is an iconic representation of meaning; it resembles the sense (the underlying syntactic grouping) of the verse.

Accentual word-grouping is not simply an unmediated reflection of underlying syntactic grouping, however. The procedure which determines the ultimate accentuation includes two sets of rules which modify the underlying structures. The rules of the first set, which may be called "phrasing" rules, re-group long and/or complex

structures into phrases that are manageable in recitation. Insofar as accentual word-grouping reflects the effect of phrasing rules, it helps convey sense, not by being the image of sense, but rather by providing phrases simple and short enough to be readily uttered and understood and which are at the same time systematically related to underlying structure (i.e., to sense).

The rules of the second set may be called "cadencing" rules. (I am using the term "cadence" in a sense that is abstracted from its musical usage: a formulaic progression that conveys the impression of leading to a close or to a point of rest. My use of this word not only as a noun but also as a verb follows colloquial usage among musicians, who speak, for example, of "cadencing on the tonic".)

Cadencing rules are further sub-categorized into "countdown" rules and "pacing" rules. Countdown rules do no re-grouping. They operate upon the phrases which emerge from the phrasing rules, marking them, according to their linear position with respect to the end of the verse, as "ultimate", "penultimate", "antepenultimate", and so forth. They are thus of the same general type as the rule of English punctuation which, for a sentence consisting of two or more independent clauses, puts a period at the end of the last clause, but only a comma or a semi-colon at the end of the others, thereby distinguishing the "ultimate" word-group from those which precede it. (Of course, the distinction indicated by this punctuation rule corresponds

to an intonational fact, namely that the voice drops after the last clause of such a series of clauses and not after the others.)

The countdown rules of the Biblical accents, as well as the above-mentioned English punctuation rule and the intonational rule which it represents, endow utterance of a Biblical verse or an English sentence with self-referential information. As it is being uttered, the utterance, by its intonation, informs the listener about its own beginning, middle and end. The effect of the countdown rules is to help convey the sense of a verse, not by mirroring the underlying syntactic structure of the verse, not by reducing that structure to a sequence of manageable phrases, but by serving as an index of the shape and extent of the uttered message which the listener is being called upon to assimilate.

Pacing rules also endow the recitation of Biblical verses with self-referential information. They create further groupings within the ultimate components of verses, slowing the pace of recitation; and they eliminate groupings in the penultimate components, quickening the pace. Differentiation of pace thus serves to signal degree of nearness to the end of the verse.

If accentual word-grouping reflects not only underlying syntactic grouping, but also phrasing and cadencing rules, as preliminarily sketched above, then the notion that the accents group words to help convey sense is

more complex than it may at first have appeared. Accordingly, it is perhaps less surprising that an integrated theory of the accents such as mine has not been proposed before, since this complex notion is an essential component of that theory. In the course of this chapter, I will be examining some of the ways that an adequate theory of Biblical accentuation has been impeded by a too-simple notion of how the accents group words to help convey sense.

The remainder of this chapter will be devoted to fuller discussions of underlying syntactic grouping, phrasing, and cadencing as determinants of accentual grouping. The next chapter will test the value of all these discussions with a set of rules for deriving the Masoretic accentuation using underlying syntactic grouping as a basis and point of departure.

### 3. "Syntactic" grouping

The accents indicate how the words of the text are grouped. When and to what extent are we justified in saying that accentual grouping is a reflection of underlying syntactic grouping?

When an accentual grouping of words into clauses involves the governing of one word or phrase by another, ordinary usage is not stretched if we call that grouping "syntactic". In Ex.40.8, for example --



And you shall set up the court round about,  
and hang up the screen for the gate of the court.

-- the accentual groupings (indicated above by the comma)  
reflect the underlying syntactic grouping by keeping the  
words which are governed by the first verb separate from  
those which are governed by the second. Also, in Isaiah  
40.3 --

A voice cries:  
"In the wilderness prepare the way of the LORD..."

-- the accentual grouping indicates that the adverbial "in  
the wilderness" is governed by the verb "prepare" rather  
than by the verb "cries". This grouping, which affects the  
way the syntax of the verse is understood, can certainly be  
called syntactic.

It is interesting to note that the King  
James version has a quite different  
understanding of the syntax of this verse:  
"The voice of him that crieth in the  
wilderness, Prepare ye the way of the  
LORD..." This translation is at variance  
with the Masoretic accentual grouping, but  
it agrees with the Septuagint, and it is not  
necessarily at variance with the consonantal  
text. There is nothing in the consonantal  
text which explicitly requires that "in the  
wilderness" be understood as part of the  
clause governed by the verb "prepare"  
rather than as part of the clause governed  
by the verb "crieth". Does this textual  
ambiguity pose a problem for a theory that  
regards the accentual grouping of this verse  
as a reflection of underlying syntactic  
grouping? I will deal with this question in  
section 4.

There is also no difficulty in calling an accentual  
grouping of words "syntactic" when it involves the

agreement of one word or phrase with another. Thus, in a translation of the beginning of Lev.10.6--

And Moses said to Aaron,  
and to Itamar and to Eleazar, his sons...

-- the name "Eleazar" must be grouped with at least one of the names which precedes it. If, for example, there were no comma after "Aaron" and there were a comma after "Itamar" --

\*And Moses said to Aaron and to Itamar,  
and to Eleazar his sons...\*

-- the grouping would clearly be wrong, because the plural phrase "his sons" must be grouped together with at least two preceding names. If there is a grammar which generates Lev.10.6, "Eleazar" must emerge from that grammar's syntactic component grouped with another name, or else, so to speak, the verse will not parse.

A more natural English translation of this verse would, by the way, reflect the accentually indicated syntactic grouping by omitting the third "to" -- "said to Aaron, and to Itamar and Eleazar, his sons..."

Even without the phrase "his sons", however, most readers of Leviticus, and certainly its writer(s), know that Itamar and Eleazar are Aaron's sons, and would expect, if there is grouping within a series of those three names, that "Itamar" and "Eleazar" would be grouped with one another and separately from "Aaron". Similarly, when, in Num.16.24, Moses is commanded to tell the congregation --

Get you up from about the dwelling of Korah,  
of Datan and of Abiram.

-- there is no grammatical fact of government or agreement which requires the names to be grouped as the accents tell us they are (with the name "Korah" separated from the other two), but this grouping is certainly not without meaning. It is clear throughout the story of the Korah rebellion that the Reubenites Datan and Abiram are not wholly identified with Korah the Levite, but constitute their own separate faction within the rebellion. This is part of the semantic apparatus of the grammar that generated the verses of Numbers 16. In that chapter and elsewhere, Datan and Abiram are always mentioned together and are always grouped separately from other names.

"Gold" and "silver" form another semantic pair that are always grouped together when they are contiguous within a series. Thus, in I Chron.18.10 (where, as in Num.16.24, a noun in construct form governs a series of three other nouns) :

...articles of gold and of silver,  
and of bronze.

More natural translations of these verses would reflect an accentual grouping of words by not repeating "of" within the grouping: "the dwelling of Korah, of Datan and Abiram"; "articles of gold and silver, and of bronze". I have used overly literal translations in order to convey that there is nothing in the consonant and vowel segments of the words which requires or indicates their being accentually grouped as they are.

It might be objected that the absence of a conjoining waw between Korah and Datan in Num.16.24 makes the grouping necessary. There is, however, no necessary connection between absence of waw and grouping within a series. Cf. the various ways in which the daughters of Zelophehad are listed, with and without waw: Num.26.33, 27.1, 36.11; Jos.17.3.

With respect, also, to accentual grouping among clauses, there is no difficulty in calling such grouping "syntactic" when it involves subordination (i.e., the government of one clause by another) and/or when a conjunction (other than waw) marks two clauses as being grouped together, e.g.:

Gen.12.4--

So Abram went,  
as the LORD had told him;  
and Lot went with him...

The grouping of the first two clauses is explicitly signalled by the conjunction "as" (ka'aser), which links them together. The third clause is not part of this grouping.

Gen.27.24--

He said, "Are you really my son Esau?"  
He answered, "I am."

The second and fourth clauses are subordinate to the first and third clauses, respectively, and are grouped accordingly.

Also, when there is "agreement" among clauses, it is easy to regard the accentual grouping of those clauses (as against other clauses which do not "agree") as "syntactic".

Two clauses can be said to "agree" when they have the same subject, e.g.:

Gen. 4.25--

And Adam knew his wife again;  
and she bore a son  
and she called his name Seth...

Adam's wife is the subject of the second and third clauses. These are grouped to exclude the first, of which Adam is the subject. A more natural translation than this deliberately literal one would reflect the accentual/syntactic grouping of clauses by omitting the second "she": "and she bore a son and called his name Seth..."

Two clauses can also be said to "agree" when a pronoun in one has its antecedent in the other, e.g.:

Ex. 40.4--

And you shall bring in the table,  
and you shall set its arrangements in order;  
and you shall bring in the lampstand,  
and you shall set up its lamps.

The first and second clauses "agree" as do the third and fourth. A more natural translation would reflect the accentual grouping not only with a semi-colon (as above) but also by the omission of the words "you shall" in the second and fourth clauses.

Agreement may also be implied even without the actual presence of a pronoun, e.g.:

Gen. 37.31--

And they took Joseph's robe,  
and they killed a goat,  
and they dipped the robe in the blood.

"The blood" here implies "its blood". The second and third clauses are grouped together in the Masoretic text. A more natural translation would omit both the comma after "goat" and the subject of the third clause.

Even without subordination, agreement or conjunctions, the grouping of clauses is still "syntactic" if it is implied by the semantic facts of the verse. Ex.24.11 contains a good example:

...and they beheld God,  
and they ate and they drank.

"They ate" and "they drank" are at the clause level what "gold" and "silver" are within a clause: a semantic pair that are naturally grouped together when they are contiguous within a series. Such semantic pairing must be part of the grammar which generates Ex.24.11, and it therefore makes sense to regard its last two clauses as "syntactically" grouped.

In Isaiah 1.17, the semantic pairing is somewhat more subtle:

Learn to do good, seek justice, correct oppression;  
defend the orphan, plead for the widow.

"Orphan" and "widow", paired in many other contexts, too, are here grouped separately from the more abstract

complements of the first three clauses. The accentual grouping of clauses in each of these examples is again a direct reflection of an underlying structure put out by the syntactic component of the grammar which generates the Masoretic text. It is therefore appropriate to regard these groupings as syntactic.

"Syntactic", as I am using it with respect to grouping, is not opposed to "semantic", but rather includes it. Accentual (i.e., intonational) grouping of words, phrases or clauses is syntactic insofar as it resembles underlying syntactic grouping; in other words, insofar as it reflects the relations among words that were meant or intended in the generation of a verse (or utterance).

#### 4. "Underlying" syntactic grouping

If we had only the consonantal text of Isaiah 40.3, it would not be clear what, according to the prophet, is happening or about to happen "in the wilderness". Is it in the wilderness that a voice is crying? Or, alternatively, is it in the wilderness that a way is to be prepared?

There is no such confusion in the Masoretic text, where the accents indicate that the locative adverb belongs to the second clause:

A voice cries:

"In the wilderness prepare the way of the LORD..."

When, as here, Masoretic accentual groupings provide syntactic information, I claim they are reflections of underlying syntactic structure. But how do we get our knowledge of what the underlying structure is? The consonantal text of this verse is ambiguous. Its letters do not, in themselves, require the grouping that the Masorah gives us. (The consonantal text would not be ambiguous if, for example, the order of the adverbial and the second verb were reversed. The adverbial would then have to be grouped with the second verb.) In such a case, where the consonantal text is ambiguous, our knowledge of syntactic intent comes chiefly (perhaps exclusively) from the accents themselves. Is my claim, that the accents reflect syntax, therefore circular and unprovable?

This question would not arise if we somehow had a tape recording of the prophet, to learn from his intonation where the adverbial belongs, or if we had a manuscript with the author's own punctuation marks. In other words, it arises because we are not sure that we have, so to speak, a reliable informant of syntactic intent. We are dealing here with an ancient and venerable written text over whose exact interpretation much ink (not to mention blood) has been spilled. If, impressed and confused by that fact, we



take "underlying" to mean (among other things) "authentic" and "original", then this question about syntactic intent may seem to challenge the whole enterprise of establishing a grammar for the Biblical accents. Masoretic accentuation may seem to be, in Isaiah 40.3 and many other verses, an optional interpretative overlay that has no necessary connection to the underlying grammatical generation of the text. Some such confusion has, perhaps, along with other factors already mentioned (see chapter I, sections 4 and 5), impeded understanding of Masoretic accentuation.

The present study is not at all concerned with the history and transmission of the Biblical text. The original and authentic meaning of that text, even if it could be positively known, would still be beside the point, though certainly not without interest. What is to the point is how the Masoretic accents work as a synchronically coherent system. I have made the claim that the basis and point of departure for their distribution is the underlying syntactic grouping of the text. I should now add -- for the sake of clarity and as a precaution against the possible charge of circularity, but without any implied negative judgment on the Masorah's relation to the consonantal text which it supplements or to any other presumed original text of the Bible --that the "underlying syntactic grouping" to which I refer is of the Biblical text as the Masoretes understood it, whether or not their

understanding is "authentic" and whether or not the consonantal text can be understood in other ways.

When, as is most often the case, the consonantal text is not in itself syntactically ambiguous, then the accents provided by the Masoretes are redundant in their role as reflectors of underlying syntactic grouping, since we know the syntactic intent without their help. Thus, in the following translation of Ex.40.8 --

And you shall set up the court round about,  
and hang up the screen for the gate of the court.

we do not actually need the comma (which reflects the heaviest accent in the Masoretic text of this verse) to tell us that "screen", for example, belongs to the second clause rather than to the first. The word-order of the translation (which mirrors that of the consonantal text) is already sufficient to tell us that.

When the consonantal text is ambiguous, however, the Masoretic accents may be essential to establish the syntactic intent, as in Isaiah 40.3 (quoted above), or in Lev.7.17, which may -- very awkwardly, but reflecting the word-order of the Hebrew text -- be translated as follows:

That which remains of the flesh of the sacrifice  
on the third day in the fire shall be burnt.

(wēhanrōtār mibbēsār hazzābah  
bayyôm haššēlîšî bā'ēs yišsārēp)

Is "the third day" of this verse the time for burning? Or is it the time that the flesh has remained (in which case no specific time is set for the burning)? The Masoretic accentuation makes clear that "the third day" is the time for burning, since the heaviest accent falls on the word for "the sacrifice" (hazzābah), grouping it and the preceding words together. Accordingly, the Masoretic version of this verse should, unambiguously and also less awkwardly, be translated as follows:

That which remains of the flesh of the sacrifice shall be burnt in the fire on the third day.

Ex. 40.8 and Lev. 7.17 each contain two clauses. For Ex. 40.8, the grouping of words into clauses is clear from the consonantal text; the syntactic intent of the verse has therefore been understood as we understand it for at least as long as our consonantal text has been in existence. For Lev. 7.17, the grouping of words into clauses is not wholly clear from the consonantal text and is disambiguated for us by the Masoretic accentuation; our "correct" understanding of the syntactic intent of this verse may thus be only as old as the written Masorah. This difference between these verses might be considered, from some points of view, to be

an important one -- from the point of view, for instance, of the study of the history of the Biblical text and its interpretations.

For the study of how the Masoretic accents work, however, this difference is irrelevant. The Masorah treats both verses the same way: it puts an 'atnah (i.e., the heaviest accent) on the last word of the first clause of each verse, grouping it and the preceding words together. The fact that the accents reflect underlying syntax is, so to speak, operationally independent of their disambiguative function. The accents, and the groupings that they effect, are present even when they are redundant, i.e., when they make no necessary contribution to understanding.

To be present even when redundant is characteristic not only of Masoretic accents but of punctuation marks in general, and of the intonation contours which they represent. I shall illustrate this point with English examples. Of the following two written representations of utterances, the first is ambiguous without punctuation marks, the second is not ambiguous:

God spoke to Moses and Aaron and the elders stood  
further down the mountain

God spoke to Moses and Aaron while the elders stood  
further down the mountain

A comma inserted after "Aaron" in the second sentence will redundantly provide the information that "Aaron" is one of the indirect objects of the first clause and not one of the

subjects of the second clause. A comma inserted after "Aaron" in the first sentence will provide the same information, but it will not be redundant.

It is worth noting that, even without a comma, the first of the writer's sentences above does not represent an ambiguous utterance. Rather, it is an ambiguous representation of two different utterances, neither of which would be ambiguous if heard rather than read. Putting a comma after "Aaron" does not determine the meaning of the sentence. Rather, it compensates for one of the representational defects of the unpunctuated written sentence -- namely, its failure to let us know where the first clause of the utterance ends. By rectifying that defect, the comma lets us know more precisely which utterance the first written sentence is supposed to represent.

Ambiguous utterances exist, too, of course; linguistic ambiguity is not confined to written representations. A well-formed utterance, complete with intonation contours, can still be syntactically ambiguous. ("They are flying planes" is a famous example of this.) There are undoubtedly Biblical verses which, even when uttered (recited) according to the accents, with all the disambiguation that these provide, leave the listener perplexed as to their syntax. In this study, however, I am not concerned with the problem of how ambiguity of utterance is resolved. I am concerned with how Masoretic accents supplement written representations (the verses of the consonantal text) by prescribing the intonation contours with which they are to be uttered, sometimes thereby disambiguating the text.

The second of the written sentences also fails to tell us where the first clause ends, but the conjunction "while" carries that piece of information with it, so that, even without a comma, the second sentence is not ambiguous. Nevertheless, it is a convention of English punctuation that a comma be placed after "Aaron" for the second sentence as well as for the first. In other words, a general rule for comma placement is: Put a comma at the end of a non-final clause. It is not the case that one puts a comma at the end of a clause only when the division between clauses would otherwise be unclear.

This convention of English punctuation is not arbitrary with respect to utterance. The fact is that, other things being equal, intonation contours for the two sentences (with comma after "Aaron" in each) would normally be identical. Thus, English intonation, as well as English punctuation, marks the end of a clause whether or not this is necessary for the sake of disambiguation.

It certainly seems relevant to the Masoretes' purposes that their accentual notations, by indicating how words are to be grouped, often resolve the consonantal text's ambiguity about which utterance (and thus which meaning) is intended. In the word grouping of ordinary utterances (and their written representations), too, we may presume that disambiguation is not simply an accidental or coincidental by-product. But the Masoretes' accentual grouping of words, like intonational and punctuational grouping in

general, operates independently of the need for disambiguation. Masoretic accentuation is not a set of glosses intended simply to put forth one meaning and exclude others. It is rather a guide to meaningful recitation (utterance). In meaningful human utterances (and often in the written representations of these), words are grouped to reflect syntactic structure, whether or not this is strictly necessary for the conveyance of meaning. Masoretic word groupings are not merely an exegetical device; they are a representation of linguistic phenomena.

In this regard, it is interesting to compare the status of the accents with that of the Masoretic vowel signs as objects of study. The vowel signs sometimes are redundant, too, in the sense that the letters of the consonantal text can only be understood one way. This is probably the case, for example, for the consonantal form  $\text{'\text{S}ITM}$ , which can only mean "you (pl.) did" and is always vocalized as  $\text{'asitem}$ . But sometimes -- more often, perhaps -- the vowel signs are essential to understanding, as for the consonantal form  $\text{'SH}$ , which can mean "he did", "doing (masc.sg.)" or "do! (masc.sg.)". In certain contexts, we may know which meaning is intended only by the word's being vocalized as  $\text{'\text{a}\text{s}\text{ā}h}$ ,  $\text{'\text{o}\text{s}eh}$  or  $\text{'\text{a}\text{s}\text{ē}h}$ , respectively. It would not occur to students of the Masorah, however, to think that redundant vowel signs function differently from those which are essential to understanding.

Whether a Masoretic vowel sign is redundant or not, its function is to indicate how a word should be uttered so as to convey whatever meaning is intended. Even when it is essential to the reader's understanding, it does not represent a comment about utterance of the Biblical text. It is not a marginal gloss on a textual difficulty, providing extra information or instruction (e.g., "Understand it this way, not that way!"). Rather, it represents a part of the utterance itself. More precisely, perhaps, it represents a part of what the Masoretes thought the correct utterance of the text should be.

In addition to vocalization and accentuation, the Masorah does importantly include a great many marginal glosses that are about the text and are not direct representations of the correct utterance of it. Students of the Masorah effectively recognize this distinction with respect to the vocalization; it is taken for granted that Masoretic vowel signs function differently from Masoretic glosses. There is no practical confusion because the nature and function of vowel signs in general is well understood.

To say that Masoretic vowel signs are not glosses is not to deny that they may be the result of the Masoretes' interpretations and speculations about the vowel system of Biblical Hebrew, about its morphology and about the meaning of the text. Where the Masoretes got their ideas of the sound and meaning of the Biblical text -- whether from an



unbroken and reliable oral tradition, or from their own devisings -- does not affect the point I am making. The point is that the Masoretes had such ideas and that the vowel signs which they provided help represent what for them is correct utterance conveying correct meaning.

Moreover, for most practical purposes, the Masoretes' ideas about Biblical Hebrew are Biblical Hebrew for us. We study the grammar of Biblical Hebrew as the Masoretes have transmitted it to us. Furthermore, we study it not as an artificial construct with its own sui generis rules, but as language, as a structured set of relations between sounds and meanings like those of other languages that we know more directly. This approach seems to work reasonably well and to yield plausible and interesting results. I do not propose to try to determine whether the success of this approach indicates that what the Masoretes have transmitted is a faithful record of a real, living spoken and written language. What I do propose to do -- what is, in fact, another way of stating my aim in this study -- is to extend that approach to the evidence that Masoretic accentuation offers us, on the assumption that it too is linguistic evidence.

##### 5. Phrasing

Insofar as accentual grouping resembles underlying syntactic grouping, it seems to serve as a direct (though

frequently redundant) conveyor of meaning. This is the case with all the examples I have adduced in sections 3 and 4. Such resemblance occurs often enough that accentual grouping can plausibly but misleadingly appear to be simply a mirror of syntactic meaning. Scholars of the accents have been led to suppose that all the word-groupings indicated by the Masoretes must mean something. When there is no simple and self-evident relationship between accentual grouping and underlying syntactic grouping (i.e., when the one does not clearly resemble the other), some sort of meaning other than syntactic has been sought.

In Ex.24.4, for instance, the principal accentual groupings (indicated by line breaks in the translation below) do not correspond to the principal syntactic units:

And Moses wrote all the words of the LORD,  
and he rose early  
    and built an altar below the mountain  
and twelve pillars for the twelve tribes of Israel.

Putting aside for the moment the internal structure of clauses, the underlying grouping of Ex.24.4 might be sketched with brackets as follows:

[And Moses wrote all the words of the LORD]  
[ [& rose early]  
    [& built an altar below the mtn. & 12 pillars...] ]

The accentual grouping is quite different:

[And Moses wrote all the words of the LORD]  
[[& rose early][& built an altar below the mountain]]  
[and twelve pillars...]

The "heaviest" accent coincides with the word "mountain", the next heaviest with the word "LORD". On purely syntactic grounds, one would rather have expected the verse division to correspond to the ends of clauses, with the heaviest break after "LORD" and the next heaviest after "rose early". (Both the RSV and the JPS translations put a period after "LORD".) But the accents put the heaviest accent within the last of the three clauses of the verse (between its direct objects).

The problem, in this verse and many others, is how to account for the apparent lack of congruity between accentual grouping and underlying syntactic structure. Scholars of the accents have formulated this problem, though not explicitly, as the question: what does syntactically incongruous accentuation mean?

The incongruity between underlying structure and accentual grouping has generally been considered even greater than I have presented it because the accentual grouping has been taken as

[ [And Moses wrote all the words of the LORD]  
[ [& rose...] [& built an altar...] ] ]  
[and twelve pillars...]

In other words, the whole verse has been regarded as divided into two units: everything which precedes the phrase "and twelve pillars..." is considered to be bracketed together as one group; the phrase

"and twelve pillars..." is the second unit. This analysis, which is required by the theory of continuous dichotomy (see pp.8-9 above and section 5 below), results also from a too literal understanding of the metaphoric description "heavy" and from failure to notice the "countdown" function of the accents, which I will discuss in section 6 of this chapter.

Wickes' comment (p.34) on Ex.24.4 is typical of his and others' answers to this implicit question:

The accentuation draws attention to the altar and the twelve representative pillars. They were to be noted from their connection with the Covenant, the ratification of which is the grand subject of the narrative.

That is, a syntactically incongruous accentual break means that the words or phrases which it divides are especially important and deserving of emphasis. In Wickes' words (p.4) again:

The accentuator did not hesitate to make the strict rules for logical (or syntactical) division give way, when they wished to express emphasis, or otherwise give effect to the reading.

For Wickes (p.35), this kind of accentuation results from a "free mode of division, adopted for the sake of effect and impressiveness in the reading..." How does Wickes know that the accentuation is intended to "draw attention" to the altar and the pillars? His implicit reasoning seems to be that, since the division is "free" (by which I assume he means that it is unconstrained by and

not predictable from syntactic or any other considerations), it must be for the sake of drawing attention (i.e., for the sake of emphasis): what else could it be for?

The linguist Mark Aronoff does have another idea of what it could be for. Aronoff follows Wickes in adopting the theory of continuous dichotomy and in denying (more explicitly than Wickes) that the accents are constrained or governed by the facts of oral recitation. But, whereas Wickes views the accentuation (especially where it is syntactically incongruous) as exegetical and midrashic, Aronoff sees it as the Masoretes' expression of an interesting (though erroneous) theory of syntax. I will deal with Aronoff's work in chapter IV, p.248ff.

If the accentual grouping really were "free", it would be difficult to disprove Wickes' kind of explanation (though not more difficult than systematically to prove it, which he does not attempt to do): in a text as variously and exhaustively interpreted as the Bible, just about any word can be persuasively presented as worthy of emphasis. In fact, however, the kind of accentual verse division exemplified by Ex.24.4 is "free" only in that it does not resemble and seems to deviate from the syntactic structure of the verse. The ways in which it deviates are quite regular; they are predictable from the syntax. (More precisely, they are predictable from the string of words as arranged in the underlying syntactic structure.) Other verses with similar syntactic structures are similarly phrased, e.g.:

Deut.31.9 --

And Moses wrote down this Torah,  
and gave it to the priests, the sons of Levi,  
who carried the ark of the covenant of the LORD,  
and to all the elders of Israel.

Here the heaviest accent coincides with the word "LORD",  
the next heaviest with the word "Torah". Again the  
heaviest accent does not divide the clauses, but rather  
divides the two direct objects of the last clause. The  
underlying syntactic structure of this verse could be  
suggested with brackets as follows:

[And Moses wrote down this Torah]  
[and gave it to the priests...and to all the elders...]

The accentual grouping is again quite different:

[And Moses wrote down this Torah]  
[and gave it to the priests...]  
[and to all the elders...]

The apparent incongruity could perhaps be explained  
once more as a matter of emphasis. Against this  
explanation, however, one might well object that, in the  
context of Deuteronomy 31, it seems at least as important  
to "draw attention" to the Torah as to the ark and the  
elders.

More generally, one must object to an "explanation"  
that looks for what might be free and irregular and ignores  
what is regular. The accentual groupings of Deut.31.9 and  
Ex.24.4 (and many other verses) differ from their

respective underlying syntactic groupings in the same or very similar ways. These accentual divisions are predictable from syntactic structure without consideration of whether any subject matter needs or deserves emphasis.

"Regularity" implies rules. The derivation of the accentual groupings of Ex.24.4 and Deut.31.9 from their respective syntactic structures can, for present purposes, be formulated as the operation of a rule which extracts the second of two (direct or indirect) verse-final objects from the brackets which enclose it and brackets that object separately. By this ad hoc rule (which will be formulated in more general way in chapter III, section 2.2), the underlying structure of Ex.24.4 --

```
[And Moses wrote...]  
[ [& rose...] [& built an altar... & 12 pillars...] ]
```

-- is rebracketed as:

```
[And Moses wrote...]  
[ [& rose...] [& built an altar...]  
[& 12 pillars...] ]
```

The same rule operates on Deut.31.9.

```
[And Moses wrote...]  
[& gave it to the priests...& to all the elders...]
```

is re-bracketed as:

[And Moses wrote...]  
[& gave it to the priests...]  
[& to all the elders...].

Wickes knows that the kind of verse division exemplified by Ex.24.4 is very common. It is "not to be regarded as exceptional, but is found everywhere," he says (p.35). Why then does he not call such verse division "regular" instead of "free"? Perhaps because it is difficult to acknowledge that something is regular, if one sees no point in the kinds of rules that could govern it. It is easy to see the point of a free mode of division which provides emphasis where needed: accentual groupings are supposed to convey meaning; emphasis is one kind of meaning. But what meaning, if any, is served by a rule like the one I have formulated ad hoc above? If syntactically incongruous accentual groupings are simply reflexes of such a rule, what kind of meaning can they be supposed to convey?

These questions make explicit the way in which scholars of the accents have implicitly dealt with what I have been calling "syntactic incongruity" and have avoided addressing the fact of its regularity. But these questions are wrongly put. They are based on a false premise: that all the word-groupings indicated by the Masoretes must mean something. This premise is an easily acceptable corollary of any theory which views Biblical accentuation as an artificial device of exegesis or grammatical analysis. The



falsity of this premise begins to be apparent when Masoretic accentuation is understood, along with Masoretic vocalization, as a prescription for correctly meaningful recitation.

If the accents prescribe recitation, and if, as I have been assuming, recitation is an essentially normal, though stylized, form of linguistic utterance, then it makes sense to try to understand the workings of the accents through consideration of how utterance works. In ordinary human utterance (e.g., of English sentences), as in Biblical recitation, the relationship between underlying syntactic structure and the grouping of the words being uttered is not always simple and direct. In ordinary utterance, phrasing, even when it derives from and relates to syntax, does not always mirror syntax; it does not always mean something in itself.

Chomsky and Halle (SPE, p.372) have proposed "readjustment rules" to account for the incongruity between syntactic structures and the phrasing of actual utterances (or, in their words, for the "discrepancy between syntactically motivated surface structure and what is apparently required as an input to the phonological component.") They demonstrate such incongruity with the sentence "This is the cat that caught the rat that stole the cheese." The underlying syntactic grouping for this sentence can be represented as follows:

[This is  
[the cat that caught  
[the rat that stole the cheese] ] ]

In utterance, the words of this sentence will be grouped quite differently:

[This is the cat]  
[that caught the rat]  
[that stole the cheese]

The intonational structure of the utterance can be derived, according to Chomsky and Halle, by means of a "readjustment rule" which "flattens" the hierarchical underlying structure into a linear "conjunction of elementary sentences (that is, sentences without embeddings)." The readjustment rule does not, of course, add any meaning (e.g., emphasis) to the underlying structure. Rather, it groups words to help convey the underlying sense. It is likely that that the flatness, or linearity, of the intonational structure, though not meaningful in itself, does make the utterance more readily comprehensible to the listener.

My aim at present not to explain, but simply to establish the existence, in utterance other than Masoretically prescribed Bible recitation, of systematic differences between intonational word-grouping and underlying syntactic structure, differences which, though not meaningful in themselves, help to get meaning across to the listener. If discrepancy between intonational and

syntactic grouping exists as a general fact of language, then grammatical descriptions in general need a notion like readjustment rules to account for it. And, if such a notion is already generally needed, then it seems reasonable to apply it to Biblical Hebrew. If readjustment rules can account for the frequent syntactic incongruity of Masoretic phrasing, then we need not go out of our way to explain this incongruity as the artful product of a "free mode of division" or as the interesting but erroneous result of "a purely theoretical notation".

General application of the notion of readjustment rules is not easily achieved, however. Chomsky and Halle's demonstration example is something of a special case. Its syntactic structure has a kind of complexity that seems to require modification in order to be uttered comprehensibly. The readjustment rule which modifies it produces intonational grouping strikingly different from the underlying structure. This grouping is virtually unaffected by the manner in which the sentence is uttered (e.g., by a fast tempo) or by the context of the utterance. (If, for example, the sentence were uttered in answer to the question "Is this the dog that caught the rat...?", its word-grouping would still be as given above, except that the phrase that includes the word "cat" would have greater prominence: "(No, ), this is the cat that caught the rat...")

The operation of readjustment rules is not confined to sentences with this kind of underlying complexity, but their effect on simpler structures is not ordinarily so clear-cut. The phrasing of ordinary utterances is a slippery thing. Readjustment rules are often optional or contingent.

Take, for example, a sentence like "John attended Harvard College and Yale University Law School." We may assume a simple underlying syntactic grouping in which subject is distinguished from predicate and, within the predicate, the verb is distinguished from its complements:

[John]  
[[attended][Harvard College & Yale Univ. Law School]]

In actual utterance, if what we may loosely call a "narrative tempo" is adopted and if context does not require any element of the sentence to be emphasized, the underlying word-grouping of this sentence may well be "readjusted" to produce the following intonational grouping:

[John attended Harvard College]  
[& Yale University Law School]

This intonational grouping of "John attended...", like that of "This is the cat...", differs from the grouping of its underlying syntactic structure. But this discrepant intonational grouping, unlike that of Chomsky and Halle's example, is not obligatory; i.e., it is not

necessary for grammaticality. The conditions under which it occurs include what we would certainly have to call performance factors. If, for instance, this sentence is uttered quickly rather than at a narrative tempo, there may be no phrasing at all; or, rather, the entire sentence may be uttered as one longish phrase.

It is also worth noting that the length of the components of a sentence, and not just the relations among them, affects the grouping of words in utterance. Thus, in a sentence like "John attended Harvard and Yale," all the components are short, and, in a non-emphatic utterance, none is likely to be set off, no matter how slow the tempo. Conversely, in a sentence like "My brainy older brother John attended Harvard and Yale," the length of the subject is likely to require some pause to set it off, even at a relatively quick tempo.

Moreover, if context requires that any part of the underlying structure receive emphasis, the intonational grouping may be quite different. If, for instance, the sentence is intended as an answer to the question "Did John graduate from Harvard College and Yale University Law School?", the verb will be emphasized and grouped together with the subject, with a break before the objects:

(No,) [John (only) attended]  
[Harvard College and Yale University Law School]

The intonational grouping of this sentence can also resemble its underlying syntactic grouping, though probably only when emphasis on the subject is called for (as, for instance, when the sentence is an answer to the question "Who attended Harvard College and Yale University Law School?")

Actually, to be precise, in discussing different utterances of the same string of words but with different contextually required emphases (or with no emphasis), we are not talking about the same sentence, but about different sentences with slightly different meanings corresponding to different contexts. The differences in meaning correspond to the different locations (or the absence) of an element of meaningful emphasis in the underlying structures of the sentences. On the other hand, in discussing the same string of words uttered in different manners (e.g., at different speeds), we are talking about the same sentence with the same underlying structure. "Manner" and "context" do not, as I am using them, have the same linguistic status.

Thus, in ordinary speech, the workings of readjustment rules, which tend to simplify or reduce underlying structure, are very often altered or eliminated by the effects of manner and context. Sentences like "This is the cat..." make it clear that grammars must include readjustment rules, but any extensive formulation of such rules for ordinary spoken language would, in actuality, be a theoretical and practical problem. It would require a grammatical description somehow to incorporate all possible manners and contexts of utterance.

The Hebrew of the Masoretic Biblical text is not a language of ordinary speech but a language of recitation. One of the ways that this recitation seems to differ from ordinary speech -- one of the elements of its stylization -- is that the discrepancies between its phrasing and its syntax are predictable from the underlying strings themselves, without reference to manner or to context. The

manner and context of the recitation are as if fixed. The phrasing indicated by the Masoretic accentuation simplifies and reduces syntactic structures with great regularity (even when these structures are not very long or complex). This phrasing thereby provides reliable and transparent evidence for the workings of readjustment rules.

Not all readjustment rules, in Biblical Hebrew or elsewhere, re-arrange, eliminate or otherwise alter existing (underlying) brackets. Some of these rules simply insert brackets where there were none, to break up a long syntactic component into manageable phrases. This is particularly the case with lists. I find the term "phrasing rules" more suitable to my purposes than "readjustment rules", since it seems more obviously to include the phenomenon of brackets simply inserted.

When they involve alteration of existing underlying structure, the workings of Biblical Hebrew's phrasing rules are, difficult to discuss in isolation; they are best seen as parts of systematic derivations, as they will be in chapter III. The phrasing of lists, however, precisely because it does not involve alteration of existing structure, does lend itself fairly well to examination in isolation. I shall therefore attempt to round out this section on phrasing as a determinant of Masoretic accentuation with a brief demonstration of how lists are phrased.

A list of more than two items is always broken down by the accents into smaller groups. Often this breakdown is a reflection of underlying grouping. This is the case with the lists that have entered into discussion so far (in sections 3 and 4): "the dwelling of Korah/ of Datan and of Abiram"; "articles of gold and of silver/ and of bronze". Those are short lists, but the same can be said of longer ones, e.g.:

Gen. 24. 32--

...and He has given him flocks and herds,  
and silver and gold;  
and men-servants and maid-servants,  
and camels and asses.

The punctuation marks of the translation (like the accents to which they correspond) pair the items on the list in a way that reflects underlying sense (i.e., underlying syntactic grouping). Another grouping might be contrary to sense, e.g.: "...flocks, and herds and silver, and gold and men-servants..."

On the other hand, the pairing of the pairs -- i.e., the placement of the semi-colon in the English translation, indicating two pairs of pairs -- is also indicated by the accents, but does not seem to convey any syntactic information. The discussion which follows will bear on this and help explain it.

There are many lists, however, whose accentual grouping does not seem to reflect any underlying syntactic grouping, e.g.:



Ex.3.8 (translated literally) --

...to the place of the Canaanite and of the Hittite;  
and of the Amorite and of the Perizzite,  
and of the Hivite and of the Jebusite.

(or less literally, using signs of grouping  
that seem more characteristic of written English)

...to the place of the Canaanite and the Hittite,  
the place of the Amorite and the Perizzite,  
of the Hivite and the Jebusite.

Here the accents indicate that the first two names are to  
be grouped together and separated from the remaining four.  
Those four are then grouped two by two.

Most probably, there is no "meaning" whatsoever in  
this grouping. "Canaanite and Hittite" is not a semantic  
pair like "gold and silver" or "Datan and Abiram".

Ex.23.23, listing the same peoples in different order,  
pairs "Canaanite" with "Perizzite" and "Hittite" with  
"Amorite". Other listings (e.g., Ex.33.2 and 34.11) offer  
still other pairings. The accentual grouping of this list  
does not, therefore, reflect an underlying syntactic  
grouping.

The fact that there is no meaning in such an accentual  
grouping does not mean that it is random, however. The  
phrasing of a list with no internal structure is, in fact,  
quite predictable and can be regarded as the regular result  
of the operation of two phrasing rules:

First\_list\_phrasing\_rule. The items are paired,  
starting with the first two items to be uttered. If there

is an odd number of items, then the last pairing will be incomplete -- i.e., the last item will be unpaired.

(a) 1 2 3 4 5 6 becomes [1 2] [3 4] [5 6]

(b) 1 2 3 4 5 6 becomes [1 2] [3 4] [5]

Second\_list-phrasing\_rule. If there are more than two pairs, the pairs themselves are paired, starting with the last two pairs.

(c) [1 2] [3 4] [5 6] becomes [1 2] [ [3 4] [5 6] ]

(d) [1 2] [3 4] [5] becomes [1 2] [ [3 4] [5] ]

(e) [1 2] [3 4] [5 6] [7 8] becomes  
[ [1 2] [3 4] ] [ [5 6] [7 8] ]

The grouping of the list of peoples in Ex.3.8 is derived as follows:

1 2 3 4 5 6	underlying unstructured list
[1 2] [3 4] [5 6]	by first rule -- cf. (a) above
[1 2] [ [3 4] [5 6] ]	by second rule -- cf. (c) above
[Canaanite & Hittite] [ [& Amorite & Perizzite] [& Hivite & Jebusite] ]	

The list of Abraham's God-given possessions in Gen.24.32 is derived as follows:

[1 2] [3 4] [5 6] [7 8]                    underlying partially  
structured list

[ [1 2] [3 4] ] [ [5 6] [7 8] ]    by second rule --  
cf. (e) above

[ [flocks & herds][& silver & gold] ]  
[ [& men-servants & maid-servants][& camels & asses] ]

The initial pairing of items in this example does not result from the "first list-phrasing rule" but is rather based on the sense of the words, i.e., on their syntactic grouping. The grouping of the pairs, however, is not based on the sense of the words. It follows from the "second list-phrasing rule".

The list of Šelophād's daughters in Num.26.33 and elsewhere is derived as follows:

1 2 3 4 5                    underlying unstructured  
list

[1 2] [3 4] [5]            by first rule  
-- cf. (b) above

[1 2] [ [3 4] [5] ]        by second rule  
-- cf. (d) above

[Maḥlāh & Nō'āh] [ [& Ḥoglāh & Milkāh][& Tirṣāh] ]

There is no reason whatsoever to attribute meaning (emphatic or any other) to the accentual grouping of such a list as this. Nor is there any cause to seek to explain this grouping as a theoretical notation expressing an interesting but erroneous theory of syntax. It seems to me self-evident that a syntactically (or semantically) unstructured list will need, in utterance by human mouths

for human ears, to acquire some linear structure. It also seems to me not surprising that such linear structure would not be randomly acquired, but would tend to follow a pattern.

It is instructive to contrast the grouping of Zelophehad's daughters with another list of five offspring that is differently grouped, the list of the sons of Judah in Gen.46.12:

[ [Er & Onan] [& Shelah] ] [& Perez & Zerah]

The grouping of this list might seem to contradict the rules I have formulated, but, upon closer examination, it turns out simply to be an exception (one of many) that proves those rules. We know from the narrative of Genesis 37 that this is not an unstructured list. The first three names are Judah's sons by his wife, the daughter of the Canaanite Shua. The other two are his sons by Tamar. There is thus an underlying division into three and two. Within the first group of three, Er and Onan form a subgroup: both were married to Tamar and both were struck down by the LORD. (Shelah was younger and did not marry Tamar.) Thus a further underlying division into two and one.

The accentual grouping of this list of Judah's sons is, therefore, entirely a reflection of underlying divisions. The list-phrasing rules do not even apply. The list of Zelophehad's daughters, on the other hand, is

clearly an unstructured list. That it has no underlying divisions is indicated by the fact that the order of the names can be scrambled, as in Num.35.11 and in Joshua 17.3. The grouping, however, remains always in accordance with the rules I have formulated: [1 2] [ [3 4] [5] ].

#### 6. Cadencing: countdown rules

The burden of sections 3, 4 and 5 has been to establish that accentual groupings help convey the sense of the text 1) by reflecting underlying syntactic structure through resemblance to that structure; 2) by reducing complex or long unstructured syntactic groupings to phrases more manageable for speaker and hearer. These two functions account for the existence and location of accentual groupings but not for the variety of the accents by which those groupings are marked.

Why, for instance, in a verse with three principal accentual groupings, should the end of each of those groupings be marked by a different accent? Thus, in II Sam.5.3 --

[And all the elders of Israel came to the king  
at Hebron]  
[and King David made a covenant with them at Hebron  
before the LORD]  
[and they anointed David as king over Israel]

-- the last word of the first group is marked with zaqep qaton, the last word of the second group is marked with

'atnah, and the last word of the third group is marked with sop pasuq.

The three accentual groupings of II Sam.5.3 happen to correspond to the clause divisions of the underlying syntactic structure, but there is no necessary connection between that fact and the accents used. This same variety of accents appears in verses whose three principal accentual groupings do not simply reflect underlying syntax, e.g., Ex.24.4:

[And Moses wrote all the words of the LORD]  
[and he rose early & built an altar below the mtn.]  
[and twelve pillars for the twelve tribes of Israel]

Here, the break between the first and second of these accentual groupings reflects the clause division of the underlying syntactic grouping. The break between the second and third of these accentual groupings results from the operation of a phrasing rule. The final accents of the three groups are the same as those in the verse from II Samuel above.

Why is the end of each group marked with a different accent? If the purpose of the accent were simply to signal the end of an intonational group, it would be sufficient to have the same accent do the job at the end of each group.

The reason for this variety is to distinguish degrees of finality.

A simple distinction between "final" and "non-final" is well recognized in English intonation and punctuation. Take a sentence like the following:

I speak English, I speak Hebrew, and I speak French.

When a matter-of-fact sentence such as this is uttered without any special attitude but merely to convey information, the intonation contours usually do no more than distinguish the clauses which are not final from the one which is final. The two non-final clauses (the first and the second) are intoned in the same way (each with the same rising inflection on the last word) and punctuated the same way (each with a comma after the last word); and the final clause is intoned differently (with a falling inflection on the final word) and punctuated differently (with a period).

In the utterance of other sentences, however, and in special circumstances -- e.g., story-telling rather than mere information-giving -- a speaker of English is quite likely to distinguish not only non-final from final, but also antepenultimate from penultimate. Thus, for a sentence like the following one, which is a translation of Gen. 37.34, a sympathetic "story-telling" rendition is likely to end the second syntactic grouping with a pitch intermediate between the pitches at the ends of the other two, thereby providing more than one degree of non-finality:

And Jacob rent his garments,  
and put sackcloth upon his loins,  
and mourned for his son many days.

The point of introducing English examples here is simply to try to establish as plausible the idea that the intonation of speech can convey degrees of finality and not just the distinction between final and non-final. Since the difference between the intonation patterns likely to be used in the two examples above is a function of manner, it would ordinarily (and properly) be relegated in a linguistic description to the realm of performance.

English punctuation, which is, of course, a form of linguistic description, does not, with its opposition of period to comma, provide for degrees of finality, but only for the simple distinction final vs. non-final. (The semi-colon gives information not about finality but about grouping, usually only grouping of clauses.)

The boundaries between competence and performance in linguistic description and theory are not really fixed in an absolute way, however; in part, they depend on practical considerations such as scope of inquiry. In a general description of English or even of English intonation, degrees of non-finality would normally have no place; the circumstances that could occasion their use are too complicated and would, for practical purposes, have to be regarded as subjective or "free". In a more narrowly focussed description of a "story-telling" sub-code (or functional dialect) of English, however, it might make



sense to regard degrees of non-finality as a regularly occurring and characteristic phenomenon, part of a storyteller's competence.

Of course, I am not concerned here with describing such a sub-code of English, but the Masoretes were concerned with describing and/or prescribing such a sub-code for the language of the Bible. Their annotations were intended as a guide not for ordinary (e.g., conversational) discourse, but for solemn public recitation. And the most significant reason for their use of such a variety of accentual annotation is to distinguish degrees of finality.

In the English translation (above) of Gen. 37.34, the ends of both non-final predications are indicated with the same punctuation mark, a comma. In the Hebrew, however, the first of these is marked with  $\bar{z}\bar{a}q\bar{e}p \bar{q}\bar{a}\hat{t}\bar{o}n$  and the second with 'atnāḥ. An accustomed listener (or reader) knows perfectly well that the coincidence of  $\bar{z}\bar{a}q\bar{e}p \bar{q}\bar{a}\hat{t}\bar{o}n$  with the end of the first predication means that he can expect to hear at least two more accentual groupings of equal or greater weight before the recitation of the verse is done. When he hears the 'atnāḥ at the end of the second predication, he knows that at least one more such grouping will follow. The sequence of accents is like a countdown, telling the listener where he is with respect to the end of the verse.

Two countdown rules map degrees of finality onto the bracketed word-groups that emerge from the phrasing rules.

The first of these rules operates only once for each verse. It assigns the greatest degree of finality (symbolized here as  $d_0$ , i.e., "degree zero" of the countdown) to the last bracket of the verse. It then moves "backwards", i.e., from right to left, counting right-hand brackets (including the one already marked  $d_0$ ) and left-hand brackets. This counting procedure ceases the first time that the number of left brackets counted equals the number of right brackets counted. The rule then assigns the second degree of finality ( $d_1$ ) to the next right-hand bracket. (The reason for naming this second degree " $d_1$ " instead of " $d_2$ " will emerge when I describe the operation of the second countdown rule.)

A counting procedure such as I just described, if it were to continue and mark all the points at which the number of right-hand brackets equals the number of left-hand brackets, would effectively be noting what could be called the immediate constituents (ICs) of the verse, the pairs of brackets (not enclosed by further brackets) into which the whole verse can be divided. The term "IC", however, is generally applied to a constituent arrived at through a procedure of syntactic analysis, or parsing. The procedure in question here operates on a string of words whose grouping is not determined purely by syntax: it has passed through and may have been altered by phrasing rules. The results of the counting procedure might better therefore be called "immediate phrasing constituents"

(IPCs). Accordingly, the first countdown rule may be described as marking the last word of the penultimate IPC of the verse.

The following are illustrative examples of bracketing to which this first countdown rule has applied:

(a) [ ] [ ]  
      d0      d0

e.g., Josh.18.10 --  
[And Joshua cast lots for them in Shilo  
   before the LORD]  
                  d0  
[and there Joshua apportioned the land to the  
   people of Israel according to their portions]  
  d0

(b) [ [ ] [ ] ] [ [ ] [ ] ]  
                  d0    d0

e.g., Ex.40.4 --  
[ [And you shall bring in the table]  
   [and you shall set its arrangements in order] ]  
  d0  
[ [and you shall bring in the lampstand]  
   [and you shall set up its lamps] ]  
  d0

(c) [ ] [ [ ] [ ] ]  
      d0    d0

e.g., Gen.37.31 --  
[And they took Joseph's robe]  
  d0  
[ [and they killed a goat]  
   [and they dipped the robe in the blood] ]  
  d0

(d) [ [ ] [ ] ] [ ]  
                  d0    d0

e.g., Gen.37.5 --  
 [ [And Joseph had a dream]  
 [and he told it to his brothers] ]  
 d0  
 [and they hated him even more]  
 d0

(e) [ ] [ ] [ ]  
 d0 d0

e.g., II Sam.5.3 --  
 [And all the elders of Israel came to the king  
 at Hebron]  
 [and King David made a covenant with them at  
 Hebron before the Lord]  
 d0  
 [and they anointed David as king over Israel]  
 d0

(f) [ ] [ [ ] [ ] ] [ ]  
 d0 d0

e.g., Ex.24.4 --  
 [And Moses wrote all the words of the LORD]  
 [ [and he rose early][and he built an altar...] ]  
 d0  
 [and twelve pillars...]  
 d0

(g) [ ] [ ] [ ] [ ]  
 d0 d0

e.g., Ex.40.22 --  
 [and he put the table] [in the tent of meeting]  
 [on the north side of the tabernacle]  
 d0  
 [outside the veil]  
 d0

This bracketing of Ex.40.22 differs from a straightforward sequence of clause components only in the pairing of verb and object. This is due to the effect of phrasing rule 2.24 (in chapter III) which pairs a verb with a one-word clause -member that follows immediately.

The placements of  $d_0$  and  $d_0$  directly determine the placements of the accents  $\hat{s}\hat{o}p \hat{p}\hat{a}s\hat{u}q$  and  $'atr\bar{n}\hat{a}h$ , respectively. For the other degrees of finality (to be introduced by the second countdown rule), this is not the case: they do not translate simply and directly (one-for-one) into accents; they must be represented by abstract symbols (like  $d_1$ ,  $d_2$ ,  $d_3$ ) which represent classes of accents defined by degrees of finality. For consistency, therefore, and in order to make clear the relationships among all the degrees of finality, I use the abstract class designations  $d_0$  and  $d_0$  rather than the names of the accents which are, respectively, the sole members of these two classes.

By determining the placement of these two accents, the first countdown rule marks the end of the verse ( $\hat{s}\hat{o}p \hat{p}\hat{a}s\hat{u}q$ ) and what has commonly been understood and described as its caesura ( $'atr\bar{n}\hat{a}h$ ). The use of the term "caesura" for the principal accentual break in a Biblical verse sometimes corresponds to its more familiar use, in description of poetry, to denote a pause at or near the middle of a line. Among the examples above, this correspondence holds for (a), which has only two clausal IPCs, and for (b), which has two IPCs, each of which in turn has two IPCs: in both of these examples, whose phrasing is symmetrical, the  $'atr\bar{n}\hat{a}h$  comes at a point which is readily identified as the syntactic "middle" of the verse.

Many verses of the Bible have an identifiable middle. In poetic and oracular passages especially, symmetrical verses consisting of two balanced and/or parallel hemistichs are common and characteristic. Since, in such verses, the last word of the first half of the verse is marked with 'atrāḥ, it is easy to understand why the prevailing view of the placement of 'atrāḥ has been as a dichotomy, i.e., as a dividing of the verse, at or near its middle, into two halves of more or less equal syntactic and/or semantic weight.

For many other verses -- probably for most verses -- there is, however, no readily identifiable middle. There is none, for example, in (c) through (g) above. But there is an 'atrāḥ in each of these five examples, as there is an 'atrāḥ in the overwhelming majority of Biblical verses, whether or not they have a "middle". The view of 'atrāḥ-placement as a matter of dichotomy is therefore problematic. If systematically applied, this view requires that, for any given verse with no readily identifiable midpoint, one be able to prove that its 'atrāḥ nonetheless marks a dichotomy of some sort.

It is not unreasonable to find a dichotomy in (c) above, even though it has no middle. In this case, the IPCs seem to be direct reflections of the underlying syntactic grouping of the clauses of the verse. Since there are two underlying clause-groups, it seems natural for the break between them to be called a dichotomy, even

though the two groups are not of equal weight (the first groups consists of one clause, the second consists of two). The same kind of reasoning can apply to positing a dichotomy in (d).

For (e) and (f), however, there are not two IPCs but three, and assertion of dichotomy does seem unreasonable. It is not at all obvious that any kind of mid-point exists either in the underlying (i.e., syntactic/semantic) grouping or in the IPC bracketing, when, as in (f), this shows the altering effect of phrasing rules. As a matter of fact, the caesura in these verses comes between the second and third (i.e., between the next-to-last and the last) IPCs. This is not just a matter of the facts of these verses, however, but a matter of rule: when more than two IPCs emerge from the phrasing rules, the caesura will always be placed between the next-to-last and the last. Attempts to make the caesura correspond to a syntactic/semantic dichotomy tend to obscure this very striking formal regularity.

There is, however, another simple but striking formal fact, of a different kind, which seems to strengthen the plausibility of the attempt to make caesura correspond to dichotomy: the fact that the effect of the countdown rules is the "same" for a left-branching structure like (d) above as it is for a multiple-branching structure like (e). That is, it is the same for

[ [ ] [ ] ] [ ]

as it is for

[ ] [ ] [ ]

In both cases, the verse has three clausal constituents, and, in both cases, the caesura comes at the end of the second of these.

As I have said, structures like (d) lend themselves to being considered dichotomous, since they have only two immediate constituents. If structures like (d) are taken as the paradigm for caesura placement, then there is a kind of theoretical pressure to view structures like (e) as conforming to that paradigm. We can regard structures like (e) as in conformity if we can somehow understand them as also having only two immediate constituents instead of the three which common-sense parsing tells us they have. This is, in fact, how most students of the accents do try to understand structures like (e).

The fact is that, for the purposes of Biblical accentuation (i.e., intonation), left-branching and multiple-branching structures are equivalent. In the present study, I can accord only marginal attention to this theoretically provocative fact, but I see no a priori logical or theoretical reason to assume that multiple-branching structures are somehow converted to left-branching structures by the accents. One could, perhaps, just as well assume the reverse: that for purposes of countdown in recitation, left-branching structures are treated as if they were multiple-branching structures.

Example (g) has four IPCs, and the caesura comes between the third and fourth of these. The very notion of "dichotomy" is stretched past its breaking point if it is used to characterize the placement of the caesura 'atnah for a (not at all uncommon) verse such as this.



The countdown rule I have formulated relates the caesura not to a presumed mid-point of a verse but to the break between its last two IPCs. This rule works no matter what the number of IPCs, and it works whether or not these IPCs are symmetrically grouped. What the caesura signals is often a dichotomy, but is always the penultimate stage of a countdown.

There is no caesura (i.e., no 'atrāḥ) when the last IPC is either non-clausal or very short. In such cases, the first countdown rule is blocked. (See section 3 of chapter III.)

The second countdown rule operates separately within each of the two portions of the verse: the portion that ends with d0, and the portion that follows d0 and ends with d0. For convenience, these portions may be called "hemistichs" or "half-lines", with the understanding that the "halves" need not be at all equal in length or in syntactic/semantic weight.

The operation that this second rule performs is the same as that of the first: it counts brackets to find IPCs. Unlike the first rule, however, the second countdown rule does not stop when it has found one preceding IPC; it continues until it has found and marked all the IPCs of the hemistich.

The second countdown rule maps the same accent-classes onto the first hemistich as onto the second. That is why I have used d0 as the symbol for the caesura (rather, say, than d1): to make clear that these two mappings are

equivalent. Thus, for instance, the next-to-last IPC of the first hemistich will be marked d1, and the next-to-last IPC of the second hemistich will be marked the same way. This is appropriate, since, other things being equal, the actual accents will also be the same for both hemistichs, as, for example, in Ex.40.4 --

```

[ [And you shall bring in the table]
                                d1
  [and you shall set its arrangements in order] ]
                                                d0
[ [and you shall bring in the lampstand]
                                d1
  [and you shall set up its lamps] ]
                                                d0

```

-- where d1 is realized in both hemistichs as zaqep qaton.

The following examples further illustrate the operation of the second countdown rule:

(a) [ ] [ ] [ ]  
       d1       d0       d0

e.g., Gen.37.34 --

```

[And Jacob rent his garments]
                                d1
[and he put sackcloth upon his loins]
                                                d0
[and he mourned his son many days]
                                                d0

```

similarly, II Sam.5.3 --

```

[And all the elders of Israel came to the king
  at Hebron]
                                d1
[and King David made a covenant with them at
  Hebron before the Lord]
                                                d0
[and they anointed David as king over Israel]
                                                d0

```

(b) [ ] [ [ ] [ ] ]  
d0 d1 d0

e.g., Gen. 37.31 --

[And they took Joseph's robe]  
d0

[ [and they killed a goat]  
d1

[and they dipped the robe in the blood] ]  
d0

(c) [ [ ] [ ] ] [ ]  
d1 d0 d0

e.g., Gen. 37.5 --

[ [And Joseph had a dream]  
d1

[and he told it to his brothers] ]  
d0

[and they hated him ever more]  
d0

(d) [ ] [ ] [ ] [ ]  
d2 d1 d0 d0

e.g., Ex. 19.2 --

[And they journeyed from Rephidim]  
d2

[and they came to the Sinai desert]  
d1

[and they encamped in the desert]  
d0

[and Israel encamped there opposite the mountain]  
d0

(e) [ ] [ [ ] [ ] [ ] ]  
d0 d2 d1 d0

e.g., Gen. 40.11 --

[And Pharaoh's cup was in my hand]  
d0

[ [and I took the grapes]  
d2

[and I pressed them into Pharaoh's cup]  
d1

[and I placed the cup in Pharaoh's hand] ]  
d0

(f) [ [ ] [ ] [ ] ] [ [ ] [ ] ]  
           d2      d1      d0          d1      d0

e.g., Isaiah 1.17 --

[ [Learn to do good][seek justice][correct oppression] ]  
                           d2                          d1                          d0  
 [ [defend the orphan][plead for the widow] ]  
                           d1                          d0

(g) [ ] [ ] [ ] [ ]  
           d2      d1      d0      d0

e.g., Ex.40.22 --

[and he put the table] [in the tent of meeting]  
   d2  d1  
 [on the north side of the tabernacle]  
   d0  
 [outside the veil]  
   d0

(h) [ [ ] [ ] [ ] [ ] [ ] ]  
           d4      d3      d2      d1      d0  
 [ [ ] [ ] [ ] [ ] [ ] ]  
           d4      d3      d2      d1      d0

Joshua 18.10 --

[ [and cast for them] [Joshua] [lots]  
                           d4          d3          d2  
 [in Shiloh] [before the LORD] ]  
                   d1                  d0  
 [ [and apportioned there] [Joshua] [the land]  
                           d4          d3          d2  
 [to the Israelites][according to their portions] ]  
                           d1                          d0

The non-English word order of the above reproduces the order of words in the Hebrew. A normal English translation of the verse, as given above among illustrations for the first countdown rule, reads as follows: "And Joshua cast lots for them in Shiloh before the LORD, and there Joshua apportioned the land to the Israelites according to their portions."

The above examples show only a single operation of the second countdown rule for each hemistich. Actually, however, the second countdown rule operates cyclically.

Having located and marked the IPCs of the hemistichs, it then returns as many times as necessary to locate and mark the IPCs of each IPC. The following example shows the results of two operations of the second countdown rule in the first hemistich:

```

II Sam. 5.3 --
[ [and came] [all the elders of Israel]
      d4                      d3
      [to the king] [at Hebron] ]
      d2                      d1
[ [and made for them] [King David] [a covenant]
      d4                      d3          d2
      [at Hebron] [before the LORD] ]
      d1                      d0
[ [and they anointed David] [as king]
      d2                      d1
      [over Israel] ]
      d0

```

Again, the word order reproduces that of the Hebrew. A normal translation, again as given above, reads as follows: "And all the elders of Israel came to the king at Hebron, and King David made a covenant with them at Hebron before the LORD, and they anointed David as king over Israel."

The above result is derived as follows:

```

[ [ ] [ ] [ ] [ ] ]           by first
[ [ ] [ ] [ ] [ ] [ ] ]     countdown
                               rule
                               d0
[ [ ] [ ] [ ] ]
                               d0

[ [ ] [ ] [ ] [ ] ]         by second
[ [ ] [ ] [ ] [ ] [ ] ]     countdown
                               rule, first
                               time through
                               d0
[ [ ] [ ] [ ] ]
      d2      d1      d0

```

[ [ ] [ ] [ ] [ ] ]	by second countdown
d4     d3     d2     d1	
[ [ ] [ ] [ ] [ ] [ ] ]	rule, second time through
d4     d3     d2     d1     d0	
[ [ ] [ ] [ ] ]	
d2     d1     d0	

After the cadencing rules have operated, accentuation rules (see chapter III, section 6) assign actual accents to the verse. These actual accents are members of the accent-classes assigned by the countdown rules, and are recognized by the listener as such. Thus, when II Sam.5.3, for instance, is being recited, the listener hears three countdowns, and each of these is more final than the one before, since the first ends with d1, the second with d0, and the last with d0. The effect is of three smaller countdowns within one big countdown:

```

4 - 3 - 2 - 1
4 - 3 - 2 - 1 - 0
           2 - 1 - 0

```

When Joshua 18.10 is recited, only two countdowns are heard:

```

4 - 3 - 2 - 1 - 0
4 - 3 - 2 - 1 - 0

```

When Ex.40.22 is recited, two countdowns are heard, but the second is very short:

The kind of information provided by these court-downs is well recognized (cf. the distinction between "final" and "non-final" in the English intonation and punctuation of a series of clauses). But the amount of this kind of information that the Masoretes have noted for the text of the Bible has not been well recognized and understood. The variety of the accents is a striking feature of the Masoretic accentual system, and the principal reason for this variety is to distinguish degrees of finality.

The variety of the accents is not, however, wholly to be explained as serving the purpose of distinguishing degrees of finality. Some of the accents are simply variants conditioned by prosodic and/or accentual environments. For example, the accent pašṭā' (of the class d2) has an alternate form, called yēṭîb, when it is assigned to a word which is the first word of an IPC and which is either monosyllabic or is stressed on a syllable other than the last. Thus, yēṭîb (  $\zeta$  ) in Ex.21.24

:

'ayin<sub>1</sub> taḥat 'ayin<sub>2</sub> "an eye for an eye"

corresponds exactly to pašṭā' (  $\zeta$  ) in Ex.21.25

kēwiyāh<sub>1</sub> taḥat kēwiyāh<sub>2</sub> "a burning for a burning"

This kind of variation, which conveys no information about finality, has already been well understood by

scholars of the accents. It must, of course, be included in any account of how the accents are distributed, not excepting my own (see chapter III, section 6), but it is a marginal (and low-level) factor in the workings of the accentual system. On the other hand, the differentiation of accents to convey degrees of finality, is absolutely central to the workings of this system. Failure to consider or even notice this phenomenon has imposed a serious limitation on scholarly understanding of how Masoretic accentuation works.

Why should conveying degrees of finality be such an important feature in a system of public recitation? I suggested earlier (p.28) that the countdown rules provide the utterance of a Biblical verse with self-referential information, information about the verse's own extent and shape. The effect of the countdown rules is to endow each word-grouping of a Biblical verse, as it is being uttered, with information about the position of that grouping in the sequence of groupings (or IPCs) which comprise the whole verse. According to this view, the countdown rules help convey the sense of the verse being recited by enabling the listener to anticipate, at any point in the recitation, the quantity and the syntactic status of the word-groupings which are still to be recited and which he will need to parse and comprehend.

In chapter IV, in discussing the Wickesian theory of continuous dichotomy, I will try to account for the fact that we find not one



but two kinds of countdown in Biblical verses: the one-shot caesura placement of my first countdown rule, and the thoroughgoing and cyclical countdown effected by my second countdown rule.

## 7. Cadencing: pacing rules

So far in this study, I have been looking at accentual word-grouping as a function of underlying syntactic grouping. I have posited phrasing rules to account for incongruity between sound and meaning (i.e., between accentual grouping and syntactic grouping), and countdown rules to account for accentual differentiation which, though ultimately derived from syntax, has no strictly syntactic significance. But accentual relationships between one word and the next can also be examined from a purely external point of view, without regard to syntactic function or derivation. As such, these relationships are of three kinds: proclitic, conjunctive and disjunctive.

The relationship between two contiguous words is proclitic if the first word has no accent of its own and is connected by maqqep to the following word. (Maqqep is typographically very similar to a hyphen, and has functional similarities as well.) In Gen. 1.2, for example, in the phrase

wěhōšek

'al - pĕnĕ

tĕhôm

and darkness was upon the face of the deep

the word 'al (upon) is proclitic on the word pĕnĕ (the face of).

The accentual relationship between two contiguous words is conjunctive if the first word bears a conjunctive accent. From an external point of view, conjunctive accents can be defined as those accents which, when they occur on the final syllable of a word that end with a vowel, cause an initial begadkepat consonant of the next word to soften. In the phrase above, the word pĕnĕ, which bears the accent mûnāḥ, is conjunctively related to the word tĕhôm which follows. (Note that the initial consonant of tĕhôm is soft.)

The accentual relationship between two contiguous words is disjunctive if the first word bears a disjunctive accent, i. e., an accent which has no phonological effect on the following word. In the phrase above, the word hosek, which bears the accent ṭiphā', is disjunctively related to the word which follows. (For demonstration that the presence of ṭiphā' does not occasion the sandhi phenomenon described in the preceding paragraph as characteristic of conjunctive accents, we must look elsewhere than in Gen. 1.2, since in that verse the word accented with ṭiphā'

does not end with a vowel and the following word does not begin with a begadkepat consonant. The first demonstration we come upon is in the final clause of Gen. 1.27:

zākār	ûneqēbāh	bārā'	'otām
male	& female	he created	them

Here, the first consonant of bārā' is unaffected by the fact that the word before it -- ûneqēbāh -- ends with a vowel and has final-syllable stress.

These three kinds of accentual relationship differ in degree of phonological closeness: a conjunctively accented word is less intimately bound to the word which follows than is a proclitic word; a disjunctively accented word is bound even less.

The brackets which we use to represent underlying syntactic structure can also be interpreted as expressing degrees of closeness. Take, for example, a string of words a, b, c, d that is bracketed as follows:

[a] [b [c d] ]

We of course interpret this bracketing to mean that the relationship between c and d is closer than that of b and c, which is, in turn, closer than between a and b.

Such degrees of syntactic closeness might reasonably be expected to correspond to degrees of phonological closeness, and, in fact, they do very often correspond quite neatly. Gen. 29.1b can serve as an example:

[wayyēlek] [ ['arṣāh] [bēnê- qedem] ]  
 [and he went][[to the land of][the people of the east]]

There are two syntactic components in this hemistich. The first -- the verb, wayyēlek -- is set off from the second by being marked with a disjunctive accent. The second component has two sub-components: 'arṣāh and bēnê-qedem. The attachment of the first to the second is indicated by its conjunctive accent. That the two parts of the second sub-component are ever more closely attached to one another is indicated by the presence of maqqēp and the absence of an accent on bēnê. Thus, disjunctive, conjunctive and proclitic correspond in this hemistich to three degrees of syntactic closeness.

Similarly, in Ex.2.21.b:

[wayyittēn] ['et-ṣippōrah bittô] [lēmōšeh]  
 [and he gave] [Zipporah his daughter] [to Moses]

Each of the three components of this hemistich is set off from the one that follows by a disjunctive accent. Within the second component, a greater degree of closeness is indicated by the conjunctive accent on ṣippōrah. Maqqēp and the absence of accent on the direct-object marker 'et marks its ever greater syntactic closeness to the word which follows it. Again, disjunctive, conjunctive and proclitic correspond to increasing degrees of syntactic closeness.

Actually, there are good reasons to suppose that, in underlying structure, the direct-object marker 'et is not grouped just with the word which immediately follows, but rather (and, perhaps, more "logically") with the whole of the component of which it is the first word:

[ ['et] [šippōrāh bittô] ]

rather than

[ ['et šippōrāh] [bittô] ].

These reasons have to do with the accentual behavior of 'et (and of two-letter prepositions like 'el and 'al, which, like 'et, are most frequently encountered as proclitics) when its component is the last in a countdown. (See the rules of "expansion" in chapter III, section 4.)

Examples of this kind of correspondence between phonological grouping and underlying syntactic grouping are abundant, as one might a priori expect and as I have stated at various points (e.g., at the beginning of section 5 on phrasing). On the basis of such examples, in which the intonational word-grouping happens to be identical with its underlying syntactic grouping, one might falsely conclude that nothing but parsing is needed to determine which words in a verse will be accentually marked as disjunctive, conjunctive and proclitic.

Very often, however, phrasing rules affect the underlying grouping so that the syntactic/phonological correspondence is not so direct. One of the most common effects of the phrasing rules is to pair a verb with a one-word following component, e.g.:

Gen. 29.1a --

[wayyissā'            ya'ʾaqōb] [raglāw]  
[and lifted up    Jacob]    [his feet]

(less literally translated:  
And Jacob went on his journey.)

Gen. 31.21b --

[wayyāsem        'et-pāriāw] [har haggil'ād]  
[and he set    his face] [to the hill of    Gilead]

(less literally translated:  
And he headed for the hill-country of  
Gilead.)

Lev. 9.6b --

[wēyērā'            'alēkem] [kebōd YHWH]  
[and will appear to you] [the glory of the LORD]

In each of the above examples, the verb is  
conjunctively accented. That is, it is accentually  
conjoined with the following one-word component.

I have given three examples instead of one  
to show that the syntactic function of the  
component following the verb is not relevant  
to the operation of the phrasing rule. In  
the above examples, the second components  
are subject, direct object and adverb,  
respectively.

Another common effect of the phrasing rules is the  
disjoining of the two parts of a compound component that  
immediately follows a verb. If the first part of the  
compound component is a single word, the verb is then  
conjoined with that, as in the three verses cited above.

For example:

Lev. 9.14a --

[wayyirḥaṣ        'et-haqqereb]    [wě'tet-hakkērā'îm]

[and he washed the entrails]    [and the legs]

Here, as before, the direct-object markers are proclitic, closely bound with the following word. A disjunctive accent is found, not on the verb, as one would expect if parsing were the only determinant, but on the first of the two direct objects. The verb is accented conjunctively, indicating that, for intonational purposes, it is grouped with the first half of the second component.

The point I have just been making, which was already implicit in previous discussion in this chapter, is that the distribution of disjunctives, conjunctives and proclitics is determined not only by underlying syntax but also by phrasing. To put it slightly differently, the accents are mapped onto a bracketing that represents the output of the phrasing rules, not directly onto the underlying structure.

It is convenient to establish the convention that, if a pair of words is to be joined phonologically by the presence of a conjunctive accent on the first word of the pair, then, in the bracketing onto which the accents are mapped, those two words share all the same brackets and are not separated by any brackets.

The reason for making this point again is to prepare the way for a different and perhaps rather surprising (or, at least, hitherto unremarked) fact: that accentual

conjoining and disjoining are determined not only by syntax and phrasing but also by cadence. For verses of greater complexity than the ones I have cited above, we cannot say whether any given word will be proclitic, conjunctive or disjunctive until we know its position in the countdown of the verse. It is not enough for the brackets onto which accents are mapped to reflect parsing and phrasing; they must also be directionally numbered. The notion of a countdown is needed not only to account for the variety of disjunctive accents; it is also needed for the even more basic task of determining when there will be disjunction at all.

When the two-word clause wěqiddaštā 'ōtô (and you shall consecrate it) occurs in Ex.40.13, the verb is conjunctively accented. We can posit that, in the bracketing onto which the accentuation is mapped, the two words of this clause are bracketed together, with no brackets dividing them: [wěqiddaštā 'ōtô]. When, however, the same clause occurs two verses earlier, the verb is disjunctively accented.

In other words, the two words of the clause in question, though grouped together, though bracketed together with respect to the other clause of the verse, are also bracketed separately from one another: [ [wěqiddaštā] ['ōtô] ] .

What accounts for the different employment of disjunction in these two verses? Not syntax -- the syntactic relationship between the two words is exactly the



same in both verses. Not phrasing -- in both verses, the two words of the clause are separated, as a group, from adjacent clauses:

Ex. 40.11 --

[ [ûmāšāhtā 'et-hakkiyyōr] [wě'et-karṁô] ]  
[ [wěqiddaštā] ['ōtô] ]  
[ [and you shall ancint the laver][and its base] ]  
[ [and you shall consecrate] [it] ]

Ex. 40.13b --

[ûmāšāhtā 'ōtô] [wěqiddaštā 'ōtô] [wěkihēr lî]  
[and you shall ancint him]  
[and you shall consecrate him]  
[and he shall serve as priest for me]

The different use of disjunction in these two occurrences of the same clause is a function of the fact that, in the first occurrence, the phrase constituted by this clause is the last phrase in a countdown, while in the second occurrence, this phrase is the next-to-last phrase in a countdown. We may assume that, in the derivations of both verses, the words wěqiddaštā and 'ōtô are joined by a phrasing rule, and that, when this phrase occurs at the end of a countdown, the two words are again disjoined. By this phenomenon of "pausal disjunction", the work of the phrasing rules is undone for the sake of cadential effect.

Cadence, as I am using the term, comprehends those features of an utterance which give the listener his

bearings with respect to the utterance's ending. In section 6, I discussed how intonation can mark the phrases of an utterance with degrees of finality. In this section, I am concerned with how expression of finality is further reinforced by the way an utterance is paced. Final ritardando effects are a feature of all sorts of stylized speech, from Cicero's orations to the reports of television newscasters. In the Masoretic text (as elsewhere), these effects are quite regularly achieved through the use of pausal disjunction.

The occurrence of pausal disjunction is by no means limited to the case of a verb followed by a one-word clause-member, like *wēqiddaštā 'ōtô* above. Two nouns in apposition, which the accents normally conjoin, are also disjoined at the end of a countdown. In the phrase *'el'āzār hakkōhēr* (Eleazar the priest), for example, the first word is normally marked with a conjunctive accent (as in Num. 26.3, 31.12); at the end of a hemistich, however, it is marked with a disjunctive accent (as in Num. 19.3, 31.31). What emerged from the phrasing rules was [*'el'āzār hakkōhēr*]; after the countdown rules have operated, but before the actual accents have been assigned, a pacing rule has changed this to [ [*'el'āzār*] [*hakkōhēr*] ].

When an appositional phrase is preceded by the direct-object marker *'et* (or by a two-letter preposition), it is interesting to note that pausal disjunction occurs on that marker, which, like the two-letter prepositions, is

normally proclitic, rather than on the first of the two words in apposition. In the phrase 'et YHWH 'ĕlōhêkâ (the LORD your God), for example, YHWH normally has a conjunctive accent, and the direct-object marker is normally proclitic (as in Deut. 8.10, 14, 18, 19, 9.7, 10.12, 14.23). At the end of a countdown (as in Deut. 6.5, 11.1), the distribution of accents is not the same: YHWH remains conjunctively accented, but 'et is accentually disjoined from the rest of the phrase. A pacing rule has changed [ 'et-YHWH 'ĕlōhêkâ ] to [ [ 'et ] [ YHWH 'ĕlōhêkâ ] ].

As I suggested earlier in this section (p. 90) with regard to 'et-šippōrāh bittô, it may make sense to see in the somewhat surprising form of this pausal disjunction a reflection of, perhaps even a reversion to, underlying syntactic structure. If so, there is an interesting parallel between accentual behavior at the end of a countdown -- what I am calling "pausal disjunction" -- and the well-known phenomenon of "pausal forms", like tišmōrû (you shall keep) at the end of a countdown (as in Lev. 19.3) instead of the "normal" tišmērû (as in Lev. 25.18). Pausal forms often exhibit the stress and vocalization that we are likely to posit as "underlying" for the morphemes in question.

For the present, only one thing more needs to be said about the process by which pausal disjunction is introduced. The pacing rule inserts new disjunctions that are unmarked with respect to countdown. Another cycle of the second countdown rule is necessary after the operation of the pacing rules. Thus, for example, in Deut. 6.5 ("And you shall love the LORD your God with all your heart and all your soul and with all your might"), the first and second countdown rules yield



[ 'ōhel mō'ēd ] . In four places (Ex.29.42, Lev.12.6,14.23, Num.27.2), however, the accentuation of this phrase is different: petah̄ is accented conjunctively and 'ōhel is proclitic. In these places, the bracketing onto which the accents are mapped must therefore be of the form [petah̄ 'ōhel-mō'ēd]. This bracketing alteration happens only in a quite specific countdown situation. The following conditions must be present:

- 1) mō'ēd must be marked d1;
- 2) the word preceding petah̄ must be marked d1 or d0 (in other words, the phrase petah̄ 'ōhel mō'ēd must correspond to the beginning of a new countdown-within-a-countdown);
- 3) the next countdown marking after the mō'ēd must be d0 or d∅ (in other words, the phrase petah̄ 'ōhel mō'ēd must be the next-to-last phrase in its hemistich).

When these conditions are fulfilled, the bracketing of the phrase is altered by a pacing rule, a rule of pre-pausal compression:

.....[	]	[petah̄]	['ōhel mō'ēd]	]	[	]
	d1	d2	d1		d0	(or d∅)

becomes



[ [wayyāqom] [melek ḥādāš] [ʿal-miṣrāyîm] ]  
d2 d1 d0

becomes

[ [wayyāqom melek-ḥādāš] [ʿal-miṣrāyîm] ]  
d1 d0

Pre-pausal compression is blocked if either of the phrases contains more than two words, even if, as is often the case when the first phrase consists of a verb, one of those words is only the monosyllabic object marker 'et. See, for example, Ex.40.5,9,10 in appendix D.

The rules of pacing are set forth in chapter III, sections 4 and 5. The point of the present discussion and of the examples offered here is that what seems like a simple question -- which words are accentually disjoined and which are conjoined? -- requires a complex answer. Accentual disjunction and conjunction do not simply mirror the sense of the parsing. The accents phrase and cadence that sense for the purposes of linear utterance.

## Chapter III: RULES

(How Masoretic accentuation may be derived  
from a parsing of the Biblical text.)

### 1. PARSING RULES

#### 1.0 Preliminary explanation.

The "rules" of this section specify the syntactic information required as a basis and point of departure for deriving the accentuation of Biblical verses. They are actually not so much rules as definitions of syntactic categories and notations for them.

In a fully integrated grammar of Masoretic Biblical Hebrew, the information needed to derive the accentuation would presumably be included in the output of a syntactic component. The term "parsing", however, denotes not output of a syntactic component, but rather syntactic analysis of a given text. I use the term "parsing" because I am concerned in this study not with the underlying rules of syntax that could generate the text of the Bible, but with something much more limited, namely the syntactic analysis which the accentuation more immediately presupposes (i.e., by which it is more immediately determined).



This more limited concern is certainly not incompatible with the larger one. I assume that my grammar of Biblical accentuation can ultimately be related to a general theory of syntactically determined intonation. For this to be so, a clear relation will have to be established between the parsing needed for the accentuation and a fully integrated grammar of Masoretic Biblical Hebrew. For present purposes, however, it would be inappropriately stringent to require of myself that I devise a syntactic component whose output provides exactly the syntactic analysis which the accents imply. That would be too long a way around a subject that is already difficult enough to encompass.

The parsing presupposed by Masoretic accentual grouping in many ways resembles what one would find in a traditional grammar-book; to that extent, its exposition below may seem unnecessary. In other ways, however, it departs from the usual categories (e.g., in the treatment of "non-phraseable words" in section 1.12, or in the definition of "internal member" in section 1.31). A step-by-step exposition has therefore seemed best, even if it often involves stating the obvious.

## 1.1 The units of parsing

1.11 The distribution of the Biblical accents may be described as a procedure. The basis and point of departure for this procedure is a verse-by-verse parsing of the text. The division of the text into verses is taken as given.

This division into verses is part of the Masorah. It is noted at the end of each verse in Masoretic texts by the symbol ׀, called *sôp pāsûq* (which means "verse-end").

There is no indication of verse-end per se in the "consonantal" text which the Masorah supplements. (The irregularly occurring "paragraph breaks" in the consonantal text have some relevance to verse division, since they never interrupt a verse but always coincide with an occurrence of *sôp pāsûq*. There are, however, very few paragraph breaks relative to the number of verses. Moreover, there is no pattern to their occurrence that can reliably be connected to syntax or even to narrative sense.)

To say that, in this study, division into verses is taken as given means that the procedure outlined here is required to explain only the distribution of accents between occurrences of *sôp pāsûq*, not the occurrences of *sôp pāsûq* itself. I hope, however, that this procedure will also offer some insight into the distribution of *sôp pāsûq* (i.e., into the division into verses), from which future studies can benefit. The principles which underlie the division of the Masoretic text into verses are, I believe, very like those which underlie the division of each verse into its accentual components. (Incidentally, no other study of the accents that I know of even raises the question of whether the division of the text into verses can be derived from a theory of accent distribution.)

1.12 The parsing of each verse provides information about the words (rather than, say, the morphemes) of the verse. The division of the text into words is also taken as given.

Our knowledge of how the text is divided into verses comes from the Masorah, but the division into words is indicated by the spacing of the letters of the consonantal text itself.

With respect to the procedure by which the accents are distributed, the words of the text fall into two categories:

- 1) words that the phrasing rules ignore;
- 2) words that the phrasing rules recognize and affect.

The category of words that the phrasing rules ignore includes the two-letter prepositions 'el, 'al, min, 'et, 'im; the direct-object marker 'et; the quantifier kol; the two-letter relation-words ben ("son of") and bat ("daughter of"); subject pronouns ('ānî, 'attāh, etc.) and also demonstrative pronouns (zeh, zō't, etc.) when they function as subjects; all conjunctions (e.g., kî, 'āšer, ka'āšer, 'im); cardinal numbers, when they precede other numbers to which they are conjoined (e.g., šeba' wē'esrîm); the negative particles lō' and 'al; and the infinitive absolute when it is used to reinforce a finite verb which immediately follows. The symbol /\ represents all these words that the phrasing rules ignore.

All of the above "non-phraseable" words are syntactically associated with a following word that the phrasing rules recognize. Also non-phraseable are na' ("please"), which is associated with a preceding word, and lē'mōr ("saying"), which is always grouped with a preceding word or phrase. The symbols for these words are, respectively, -p and -q ("q" for quotation).

All other words are "phraseable": the phrasing rules may affect them. The phrasing rules recognize two kinds of phraseable words: verbs (finite or non-finite) and non-verb. The symbol for a verb is  $\Delta V \Delta$ ; the symbol for a non-verb is  $\Delta \Delta$ .

In the procedure for deriving accentuation from parsing, the non-phraseable words do not come into play until the cadencing rules; that is, not until much later on. For clarity and convenience, the symbol for these words is therefore suppressed during the operation of the phrasing and countdown rules. The location of a non-phraseable word is indicated by a hyphen attached to the following word. Thus, in the parsing of Gen. 1.15, the words 'al hā'āreṣ ("on the earth") are represented as  $-\Delta \Delta$  rather than as  $\Delta \Delta$ . In the parsing of Ex. 40.9, the words wē'et kol 'āser bô ("and all that is in it") are represented as  $---\Delta \Delta$ , rather than as  $\Delta \Delta \Delta \Delta$ .

Many, but by no means all, of the non-phraseable words, especially those which are monosyllabic, will turn out to be proclitic in the ultimate accentual sequences. It is important to note, however, that establishing the category of

non-phraseable words is for the sake of the phrasing rules, to clear away (temporarily) those words which the phrasing rules do not recognize and affect. The category of non-phraseable words is not equal to the category of proclitic and enclitic words, which includes both phraseable and non-phraseable words. Whether a word is to be proclitic/enclitic can only be determined much later, in section 5, after phrasing, countdown and pacing rules have applied.

1.13 Parsing is an analysis of the words of each verse into clauses and clause-members, and of the words of each clause-member into sub-members.

A "clause" may be a proposition with a finite verb or with an unexpressed copula; it may also be an infinitival phrase, a participial phrase (when the participle is functioning as a verb and not as a construct noun), or a gerundial phrase (i.e., a phrase that includes an infinitive absolute that governs other words and is not simply a reinforcement of a finite verb). "Elbows" -- ( ) -- indicate the beginning and end of a clause.

A "clause-member" (henceforth, simply "member") is a word or word-group which functions in a clause as a verb, subject, object, or adverb. Parentheses -- ( ) -- indicate the beginning and end of a member.

A member consists of one or more phraseable words. When there are only two words, no indication of grouping is necessary other than the parentheses which enclose the whole member. When there are more than two words, there may be groupings among them. Brackets -- [ ] -- indicate

the beginnings and ends of such groupings. Any word or group of words within a member can be called a sub-member.

## 1.2 Intra-member relations

1.20 Syntactic bonds between sub-members are of two basic types: subordinate and coordinate. Subordinate relations may be further characterized as strict or loose. Coordinate relations may be further characterized as restrictive or non-restrictive.

These distinctions -- subordinate/coordinate, strict/loose, restrictive/non-restrictive -- are essential to the working of the phrasing rules. The susceptibility of any two sub-members to being re-grouped by the phrasing rules is a function of the type of syntactic bond between them. A relation of strict subordination, for example, is highly resistant to dissolution; sub-members in that relation to one another are not readily re-grouped. At the opposite extreme, a relation of non-restrictive coordination tends easily to be dissolved; sub-members in that relation to one another are readily and frequently re-grouped.

See 1.25 below for examples of how syntactic bonds differ in their susceptibility to re-grouping.

1.21 Quite apart from the restrictive/non-restrictive distinction (which will be taken up in 1.26), a coordinate relation between sub-members may be serial or non-serial. A serial relation is characterized by the fact that the sub-members have different references.

The symbol + between sub-members indicates that they are in series with one another, as in Gen.1.1 ("the heavens and the earth"):

'ēt haššamāyîm wē'ēt hā'āraš...  
 ( -△ + -△ )

Brackets are used to indicate grouping within a coordinate series, as in Gen.46.12 ("Er and Onan and Shelah, and Perez and Zerah"):

( [ [ △ + △ ] + [ △ ] ] + [ △ + △ ] )

See above pp.65-66 for explanation of this underlying grouping.

1.22 Two sub-members in non-serial coordinate relation have the same reference; that is, they "agree" with one another. If the second is a substantive, it is usually described as being in apposition to the first. If the second is an adjective, it is usually described as an attribute of the first. The phrasing rules do not recognize this difference, however: appositional and attributive relations are treated the same way. (This is

not surprising, since Biblical Hebrew adjectives readily function as substantives.)

The symbol = between sub-members indicates that they are in non-serial coordinate relation with one another. (That is, the symbol = precedes an apposition or an attributive adjective.)

I Ki.1.31 ("my lord King David")

'ādōrî<sup>h</sup> hammelek dāwīd  
( [  $\Delta$  ] = [  $\Delta$  =  $\Delta$  ] )

Gen.1.16 ("the greater light")

'et hammā'ōr haggādōl  
( - $\Delta$  =  $\Delta$  )

I Ki.11.1 ("many foreign women")

nāšîm nokriyyōt rabbōt  
( [  $\Delta$  =  $\Delta$  ] = [  $\Delta$  ] )

Deut.1.13 ("wise, understanding and experienced men")

'ānāšîm ḥākāmîm ûnebōnîm wîdu'îm  
( [  $\Delta$  ] = [  $\Delta$  +  $\Delta$  +  $\Delta$  ] )

1.23 Strict subordination within a member is the government of one or more substantives by another substantive that is in construct state. This relation is indicated by an asterisk between the governing and the governed substantives.



Gen. 1.2 ("upon the face of the deep")

'al pēnê tēhôm  
( -△ \* △ )

Ex. 29.42 ("the door of the tent of meeting")

petah 'ōhel mō'ēd  
( [ △ ] \* [ △ \* △ ] )

Ex. 3.1 ("the flock of Jethro his father-in-law, the priest of Midian")

'et šō'n yitrō hōtērō kōhēn midyār  
( [ -△ ] \* [ [ △ ] = [ △ ] = [ △ \* △ ] ] )

Included in this category is the government of a substantive by a preposition that, in origin and in form, is a substantive in construct state prefixed by one or two one-letter prepositions.

I Ki. 8.41 ("for the sake of your name")

lēma'an šemekā  
( △ \* △ )

Gen. 41.46 ("from before Pharaoh")

millipnē par'ōh  
( △ \* △ )

1.24 Loose subordination is the government of one sub-member by another, not through the device of construct state, but through the intermediary of a preposition. This relation is represented by the symbol @.

The governing sub-member may be an adjective:

Gen. 2.9 ("pleasant to the sight")

nehmād lēmar'eh  
[ / \ @ / \ ]

Gen. 38.7 ("wicked in the sight of the LORD")

ra' bē'ērē YHWH  
[ / \ ] @ [ / \ \* / \ ]

Very often the governing sub-member is a one-word adverb with a prepositional prefix:

Num. 32.19 ("beyond the Jordan")

mē'ēber layyardēn  
( / \ @ / \ )

Num. 16.24 ("from about the dwelling of Korah, of Datan and Abiram")

missābīb lēmiškan kōrah dātān wa'ābirām  
( [ / \ ] @ [ [ / \ ] \* [ [ / \ ] + [ / \ + / \ ] ] ] )

For explanation of the grouping within the series of proper names in this phrase, see pp.31-32 above.

The compound preposition bēn ... ūbēn ("between") is something of a special case. (Literally, it means "between...and between...") The phrasing rules work best if this expression is understood as involving loose subordination, though it might seem that the relation between the part was one of serial coordination. In Gen. 1.14, for example, in the clause lēhabdīl bēn hayyôm ūbēn hallāylāh ("to distinguish between day and night"), the compound prepositional phrase should be parsed as follows: ( [ - / \ ] @ [ - / \ ] ). The word ben appears in two alternative expressions that have the same meaning as bēn... ūbēn: bēn... lēbēn (literally, "between ... to between") and bēn... le... (literally, "between... to..."). The intermediate preposition lē in the two

alternative expressions suggests the semantic appropriateness of categorizing all three equivalent expressions as involving loose subordination. For derivations that involve *ben*, see Gen. 1.4, 6, 7, 14 in appendix C and Ex. 40.7 in appendix D.

Combinations such as *mē'ēber lē...* and *missabîb lē...* are fixed expressions functioning as complex prepositions. But an adverbial sub-member that governs by loose subordination need not be a fixed expression:

Ex. 12.6 ("until the fourteenth day of this month")

'ad  
 'arbā'āh  
 'āsār yôm lahōdēs hazzeh  
 [ [ --△ = △ ] @ [ △ = △ ] ]

Num. 36.13 ("in the plains of Moab at the Jordan of Jericho")

bē'arbūt mō'āb 'al yardēn yērēḥō  
 [ [ △ \* △ ] @ [ -△ \* △ ] ]

In the above example from Exodus, it seems natural, even without the information provided by the accents, to understand the second prepositional phrase, on general semantic grounds, as a modification of (i.e., as subordinate to) the first. But this is not quite so for the example from Numbers: there the second prepositional phrase might well be construed as an independent adverb with its own relation to the verb of the clause. (The full text of the verse translates as: "These are the commandments and the ordinances which the LORD commanded

through Moses to the Israelites in the plains of Moab at the Jordan of Jericho.") Nevertheless, the accents signal that the two adverbs are to be taken together, the second modifying the first, and it is, in fact, quite normal in Biblical Hebrew and elsewhere for two adverbs to form a kind of compound adverbial expression. ("In the paragraph below" and "out there on the horizon" are examples in English.)

Partial subordination resembles loose subordination in that it involves government of one sub-member by another through the intermediary of a preposition. The governing relation between the sub-members is even weaker and less complete, however, and each sub-member is more clearly independent in its relation to the verb. Partial subordination is represented by the symbol @@ .

I use a doubling of the symbol to show visually that the two components are, as it were, even further apart. Similarly, in my exposition of intra-clause relations, I shall introduce (in section 1.33 below) the symbol MM to represent a relation of member to verb that is weaker and more marginal than the relation that is represented by the symbol M .

The category of partial subordination is required for the proper parsing of what can be called "complex compound members". A compound member is simply a member whose sub-members are in serial relation to each other (see section 1.21 above). As long as the serial relations that it contains are non-restrictive (see section 1.26 below), the presence of a compound member implies the combining of two

deep-structure sentences. Thus, Lev.9.14a -- "and he washed the entrails and the legs" -- can be regarded as the combining of "and he washed the entrails" with "and he washed the legs." The parsing of the compound member in the "combined" sentence poses no problems:

'et haqqereb wě'tet hakkērā'îm  
 (     -/Δ     +     -/Δ     )

The simplicity of this example has to do with the fact that the deep-structure sentences that it implies each consists only of the verb and one of the sub-members of the compound member. When, however, the sentences to be combined have more components, the compound member must be complex. In Ex.24.4, for example, we find the clause "and he built an altar under the mountain and twelve pillars for the twelve tribes of Israel." Two deep-structure sentences are implied: 1) "and he built an altar under the mountain"; 2) "and he built twelve pillars for the twelve tribes of Israel."

In these separate deep-structure sentences, the adverbial prepositional phrases "under the mountain" and "for the twelve tribes of Israel" are both directly subordinate to the verb. In the actual combined sentence, however, there is a compound direct object, and each of the prepositional phrases is associated with only one component of that compound direct object. A parsing of the combined sentence must make note of these exclusive associations

while maintaining the integrity of the compound direct object. Accordingly, the compound direct object can be parsed as follows:

" an altar      under the mountain  
 mizbēah      taḥat hāhār  
 ( [ [ Δ ] @@ [ Δ \* Δ ] ] +

and 12      pillars      for the 12      tribes of Israel"  
 ūstem 'esrēh massēbāh      lišnem 'āsār      šibtē yisrā'el  
 [ [-Δ \* Δ ] @@ [ [-Δ ] \* [ Δ \* Δ ] ] ] )

For the necessity of "partial subordination" in addition to "loose subordination", see rules 2.12a and 2.22a as well as the derivation of Gen.45.8b in Appendix B.

1.25 As stated above (1.20), coordinate bonds differ from subordinate bonds in their greater susceptibility to being re-grouped by the phrasing rules. The actual operations of the phrasing rules will be the subject of a later section (section 2). In the meanwhile, however, it may be useful to look at some examples that illustrate the difference between the phrasing of coordinate relations and the phrasing of subordinate relations.

The difference shows up most clearly in a member that immediately follows the verb of its clause. Thus, a member that consists of two phraseable words in serial coordination is likely, in that position, to be split up by the phrasing rules, so that the first of the two words will be grouped with the verb and the second will stand alone. In Ex.40.12, for example, the object of the verb wēhiqrabtā

("and-you-shall-bring") consists of two phraseable words: 'et-'ahārōn wě'et-bāriāw ("Aaron and-his-sons"). The member is schematically represented as  $(-\Delta + -\Delta)$ . The effect of the phrasing rules is to change

[wēhiqrabtā ] ['et-ahārōn, wě'et bāriāw]  
[and-you-shall-bring] [Aaron and-his-sons ]

to

[wēhiqrabtā 'et-ahārōn ] [wě'et-bāriāw ]  
[and-you-shall-bring Aaron] [and-his-sons]

In Ex.40.9, the object of the verb wělāqaḥtā ("and-you-shall-take") also consists of two phraseable words: 'et-šemen hammišḥāh ("the-oil-of anointing"). The relation between these words is one of strict subordination; the member is schematically represented as  $(\Delta * \Delta)$ . This grouping, unlike the one above, survives the phrasing rules. In particular, there is not a change from

[wělāqaḥtā ] ['et-šemen, hammišḥāh ]  
[and-you-shall-take] [the-oil-of anointing]

to

\*[wělāqaḥtā 'et-šemen] [hammišḥāh]  
\*[and-you-shall-take the-oil-of] [anointing]

In Jer.25.15, the subject of the verb 'āmar ("said") consists of three phraseable words: YHWH 'ēlōhê yiśrā'ēl (YHWH the-God-of Israel). The first of these words is in non-serial coordination with the other two. The member is schematically represented as  $( [ \Delta ] = [ \Delta * \Delta ] )$ . The effect of the phrasing rules is to change

[ʿāmar] [YHWH ʿēlōhē yisrāʿēl ]  
[said ] [YHWH the-God-of Israel]

to

[ʿāmar YHWH] [ʿēlōhē yisrāʿēl ]  
[said YHWH ] [the-God-of Israel]

In II Sam.19.44, the subject of the verb wayyiqeš  
("and prevailed") also consists of three phraseable words:  
dēbar ʾîs yēhūdāh ("the word of the man of Judah").

In the final form of this phrase, the word  
debar is proclitic, but that fact is  
irrelevant here. The word dēbar is a  
phraseable word (see 1.12). Cadencing  
rules, rather than parsing or phrasing  
rules, account for the fact that it  
ultimately bears no accent in this  
position. (It does bear an accent later in  
the verse, for example.)

The second and third words form a sub-member whose relation  
to the first word is one of strict subordination. The  
member is schematically represented as

( [ Δ ] \* [ Δ \* Δ ] )

The structure of this member, unlike that of the example  
above, survives the phrasing rules. In particular, there  
is not a change from

[wayyiqeš]      [dēbar      ʾîs      yēhūdāh]  
[and-prevailed] [the word of the man of Judah]

to



\*[wayyiqeš dēbar] [ʾîš yēhūdāh]  
 \*[and-prevalled the word of] [the man of Judah]

1.26 A coordinate relation is restrictive if separation of the coordinate sub-members (through phrasing) would have a false, misleading or confusing effect. If coordinate sub-members can be phrased separately without such an effect, then their relation is non-restrictive. Underlining marks the restrictivity of a coordinate relation: ± and ± represent restrictive bonds, while = and + represent non-restrictive bonds.

Although restrictivity is a familiar notion in grammar, it may not be obvious how it bears on Biblical accentuation. Some demonstration therefore seems appropriate.

Ex.21.15 contains an example of non-restrictive coordinate sub-members that are re-grouped by the phrasing rules:

ûmakkēh 'ābiw wə'imnô môt yûmāt

The first word is a participle meaning "one who strikes" (or, more literally, "a striker of", since the participle is in construct state). The last two words mean "shall surely be put to death." It is the second and third words with which we are concerned. Literally translated,

they mean "his father and his mother." It is clear, however, that, according to this verse, those who are to be put to death include:

- 1) one who strikes his father;
- 2) one who strikes his mother;
- 3) one who strikes both his father and mother.

In other words, a very exact rendition of the meaning of 'ābîw wě'immô would be "his father and/or his mother". The usual and more idiomatic translation -- "his father or his mother" -- is correct because English tends to use "or" to express an "and/or" relation (whereas Biblical Hebrew tends to use the prefix wě, whose most general meaning is "and").

Phrasing rules re-group the underlying [makkēh][ 'ābîw wě'immô]; the result is [makkēh 'ābîw][wě'immô]. This change can schematically be represented as the change from

to

$$[ \triangle ] * [ \triangle + \triangle ]$$

$$[ \triangle \triangle ] + [ \triangle ]$$

No falsity or confusion seems to result from this change because makkēh 'ābîw ("one who strikes his father"), even standing alone (without 'immô), is one of the three categories to which the proposition of this verse applies. If, however, the proposition were meant to apply only to "one who strikes both his mother and father", then the phrasing which results from the phrasing rules might well seem misleading.

Gen. 3.5 contains another example of a construct-state participle that governs two coordinate substantives:

yōdē'ê    ṭōb wārā'  
(knowing good and evil)

In this case, the text is generally understood (by the Masoretes and everyone else) to be concerned not with knowledge of good, not with knowledge of evil, but only with knowledge of good and evil together ("good-and-evil", perhaps). The coordinate words ṭōb wārā' cannot be re-grouped without a false result. The bond between them is restrictive:

[ Δ ] \* [ Δ ± Δ ]

Restrictivity inhibits the operation of the phrasing rules. The underlying grouping

[knowing] [good and evil]

is not changed to

\*[knowing good] [and evil]

The restrictivity found in Gen. 3.5 derives from a specific lexical fact: that, in the Biblical lexicon, there exists a notion of "good-and-evil" that is not just a coordination of the separate notions "good" and "evil". Specific lexical restrictivity is one of several kinds of restrictivity that can inhibit the phrasing rules. Another

kind derives from the more general lexical categories of familial or social status. When a proper name is followed by a one- or two-word apposition that defines its status with respect to another proper name, the coordinate bond between the first proper name and its apposition is restrictive. For example:

Gen. 30.12    wattēled zilpāh šiphat lē'āh...  
 And Zilpah Leah's maid bore...

Gen. 38.7    wayhî 'ēr bēkôr yehūdāh...  
 And Er Judah's firstborn was...

For both of these examples, the parsing of the subject can schematically be represented as

$$( [ \Delta ] \equiv [ \Delta * \Delta ] )$$

Except for the mark of restrictivity, this schema is identical to the one offered (in section 1.25) above for the phrase taken from Jer. 25.15: YHWH 'ēlōhē yiśrā'ēl ("YHWH, God of Israel"). Deuteronomy 33.1 contains yet another example of what this schema can represent (without the mark of restrictivity): mōšeh 'îš hā'ēlōhîm ("Moses, the man of God").

Clearly, the appositions "Leah's maid" and "Judah's firstborn" provide information about familial or social status. The function of such information is generally, if not in every case, to identify a person, to make sure there is no confusion about exactly which person has been

mentioned. By contrast, the appositions "God of Israel" and "the man of God" are not needed for identification purposes; they are supplementary descriptions.

Accentual grouping reflects this difference. The bracketing of the schema that is marked for restrictivity (as in the two examples from Genesis) is unchanged by the phrasing rules. By contrast, the bracketing of the schema that is not marked for restrictivity, when it immediately follows its verb (as in the examples from Deuteronomy and Jeremiah), is changed by the phrasing rules:

[ /v\ \ ] [ \ \ ]

is the result. Thus, as already shown in 1.25,

[said] [YHWH the God of Israel]

is changed to

[said YHWH] [the God of Israel]

Similarly,

[spoke] [Moses the man of God]

is changed to

[spoke Moses] [the man of God]

One more kind of restrictivity needs to be mentioned. This is the kind that derives from the facts, "grammatical" rather than lexical, of agreement: agreement between a

plural verb and two singular substantives which are its subject, or agreement between a plural substantive and two singular substantives with which it is in apposition.

Thus, in Ex.5.1, the coordinate bond between the subjects "Moses" and "Aaron" must be restrictive because the verb (ba'u -- "came") is plural.

[bā'û] [mōšeh wě'ahārōn]

is not re-grouped by the phrasing rules, presumably because the pairing of a plural verb with a singular subject --

\*[bā'û mōšeh] [wě'ahārōn]

-- would be confusing.

(There is a converse to this last kind of restrictivity. It is common in Biblical Hebrew for two or more subjects to follow a singular verb, if the first of those subjects is singular. Then, of course, it is normal for the phrasing rules to pair the verb with the first subject, e.g.:

Ex.4.29--  
[wayyēlek mōšeh] [wě'ahārōn]...  
Then Moses and Aaron went...

In such cases as these, the coordinate bond between the subjects can clearly not be restrictive.)

### 1.3 Intra-clause relations

1.30 With respect to the verb of a clause, any other member of that clause can be characterized as internal or external. External members can be further characterized as central or marginal.

Characterizations such as these might seem superfluous in normal linguistic description, which does not attempt to account for intonational word-grouping. They are essential, however, to the working of the phrasing rules of Masoretic Hebrew, and it seems likely that some such distinctions play a role in the intonational word-grouping of language in general.

1.31 A member is internal if it is:

- 1) a one-word indefinite direct object, as in Gen. 6.8--

wērīcaḥ māšā' **hən** bē'ênê YHWH  
And Noah found **favor** in the eyes of the  
LORD.

- 2) a pronominal direct object (i.e., an inflected form of the direct-object marker 'et), as in Gen. 1.17--

wayyittēn 'ōtām 'ēlōhîm birqîa' haššāmāyîm  
And God set **them** in the firmament of the  
heaven...

- 3) a pronominal adverb (i.e., an inflected preposition), as in Gen. 2.3--

kî **bo** šābat mikkol-mēla'ktô  
because **on it** He rested from all His work

- 4) any direct object that precedes its verb, as in Gen. 3.10--

'et qōlēkā ṡāma'tî baggār  
 ...your voice I heard in the garden...

The symbol of the relation between an internal member and its verb is "m" . Thus:

wayyittēr ṡōtām  
 √ √ = √

bō ṡābat  
 √ = √ √

Note that the symbol of relation is placed between the verb and the member regardless of which precedes which.

1.32 A member that does not fit any of the above definitions of "internal" is external. An external member is central if it is:

- 1) a direct object, as in Gen.1.7--

wayya'as 'ēlōhîm 'et hārāqîa'  
 And God made **the firmament...**

- 2) the subject, as in Gen.1.7--

wayya'as 'ēlōhîm  
 And **God** made...

- 3) a predicate noun or adjective with a copula (expressed or unexpressed), as in Gen.1.2--

wēhā'āreṡ hāyētāh tōhū wābōhū  
 And the earth was **formless and void...**

- 4) an adverb or adverbial phrase, immediately following or preceding its verb, that serves as an indirect object, or that answers the question "whither" for a verb that involves movement, as in Gen.3.19--



wə'el 'āpār tāsūb  
...and to dust you shall return.

--and in Gen.31.33--

wayyābō' bə'ohel rāhēl  
...and he went into Rachel's tent.

or that answers the question "where" for a verb that involves positioning, as in Gen.13.12--

'abrām yāšab bə'eres kənā'an  
Abram dwelt in the land of Canaan...

--and in Ex.40.7--

wērātattā šam māyim  
and you shall put water therein.

5) an adverb or adverbial phrase that is a necessary complement to its verb, as in Ex.4.3--

wayhî lənahās  
...and it became a serpent

-or as in Ex.23.21--

ūšəma' bəqōlō  
and obey his voice

--or as in I Ki.8.16--

wā'ebhar bədauid lihyōt 'al 'ammî yisrā'ēl  
...and I chose David to be over my people  
Israel.

The fourth and fifth of these categories of central external members are unlike the first three in that they are defined not only syntactically but also lexically, in two different ways. Members of the fourth category are associated with verbs that possess certain semantic features ("movement", "positioning") that would be marked in a lexicon.

Members of the fifth category are also associated with lexically marked verbs, but these verbs do not belong to any particular semantic field. Rather, they are verbs that are marked for occurrence with prepositional phrases that function semantically like direct objects or

predicate nouns. I shall not attempt to provide a list of these verbs for Biblical Hebrew -- that is the job of a lexicon rather than of a grammatical description -- but the existence of such verbs is well recognized.

The symbol of the relation between a central member and its verb is "M". Thus:

(wayya'as) ('ēlohîm) ('et hārāqîa')  
 ( /v\ ) M ( /\ ) M ( -/\ )  
 (wə'al 'āpār) (tāsûb)  
 ( -/\ ) M ( /v\ )

When there is a copulative relation between subject and predicate but no explicit verb, then the relation between subject and predicate is represented by the symbol "M:" or "m:", as in the following examples:

Gen. 2.12

"and the gold of that land is good"

ûzāhāb hā'āreṣ hahî' tōb  
 ( [ [ /\ ] \* [ /\ = /\ ] ] ) M: ( /\ )

Gen. 1.12

"...whose seed is in it"

'āser  
 zar'ô bô  
 ( -/\ ) m: ( /\ )

1.33 An external member is marginal if it does not belong to any of the above categories. Adverbs of time and manner are always marginal, and adverbs of place are marginal if

they do not fit into the fourth category above. Also marginal are what might be called "expansive appositions", i.e. phrases that expand an already expressed or implied subject; such phrases are in apposition to the subject but not necessarily in agreement with the verb. For example, in Gen. 19.30:

wayyēšeb bammē'ārāh hū' ūstê bənōtāw  
 ...and he dwelt in the cave, **he and his two daughters.**

The symbol for the relation between a marginal member and its verb is "MM". Thus, in Gen. 3.10:

('et qōlēkā) ( šāma'tî) (baggān)  
 ( -/ \ ) m ( / \ ) MM ( / \ )  
 Your voice I heard **in the garden.**

#### 1.4 Inter-clause relations

1.40 The inclusion of two or more clauses within a single verse constitutes, with respect to other clauses not included, a grouping of clauses. The principles that determine this grouping of clauses into verses are outside the scope of this study; as already stated (in 1.11), division into verses is taken as given.

Within the verse, there is, however, further grouping of clauses with which the present study is very much concerned. A clause may be dependent upon or independent of another clause with which it is grouped.

1.41 Clauses are independent of each other if no one of them is contained by any other.

If two independent clauses comprise a verse, the relation between them is schematically represented by simple juxtaposition:

( ) ( )

If a verse consists of three or more independent clauses, there may be grouping among them. Braces -- { } -- indicate the beginning and end of a group of independent clauses. For example:

Gen. 40.11--

<And Pharaoh's cup was in my hand>  
{ <and I took the grapes>  
    <and I pressed them into Pharaoh's cup>  
    <and I placed the cup in Pharaoh's hand> }

Isaiah 1.17--

{ <Learn to do good> <seek justice> <correct oppression> }  
{ <defend the orphan> <plead for the widow> }

1.42 A dependent clause is contained within another (matrix) clause. A dependent clause functions as a member or sub-member of its matrix clause.

The boundaries of a clause which functions as a member of another clause are represented by elbows (clause boundaries) contained within parentheses (member boundaries) and preceded by M or MM:

...M ( ( ) )...

A dependent clause may be the complement of the matrix clause's verb:

Ex. 2.21--

(And Moses agreed to stay with the man...)

wayyô'e1 mōseh lāsebet 'et-hā'îs

( ( /v\ ) M ( / / ) M ( ( ( /v\ ) M (- / ) ) ) )

Ex. 33.18--

(And he said: "Please show me your glory.")

wayyōmar har'ēni nā' 'et-keḇōdekā

( ( /v\ ) M ( ( ( /v\ -p ) M (- / ) ) ) )

Or it may function as an adverb:

Gen. 1.17--

(And God set them in the expanse of the sky to shine upon the earth.)

wayyittēn 'ōtām 'ēlōhîm birqîa' hassāmāyim  
leḥā'îr 'al-hā'āres

( ( /v\ ) m ( / / ) M ( / / ) M ( / / \* / / )

MM ( ( ( /v\ ) M (- / ) ) ) )

Ex. 40.25--

(And he lit the lamps before the Lord,  
as the Lord commanded Moses.)

wayya'al hannērōt lipnê yhw  
 ka'āsēr sīwāh yhw 'et-mōsh

< ( ( /v\ ) M ( /\ ) MM ( /\ \* /\ )

MM ( ( ( -/y\ ) M ( /\ ) M (-/\ ) ) ) >

1.43 The boundaries of a clause which functions as a sub-member of another clause are represented by elbows (clause boundaries) contained within brackets (sub-member boundaries):

[ < > ]

A clausal sub-member's relation to its fellow sub-member(s) may be one of serial coordination. If so, the sub-member(s) with which it is coordinate will also be clausal. For example:

Num. 23.16--

(...and he said: "Return to Balak and speak thus.")

wayyōmer            ſub            'el bālāq            wākōh            tādabbēr

< ( /v\ ) M ( [ ( /y\ ) M (-/\ ) ] + [ ( /\ ) M ( /v\ ) ] ) >

Ex. 33.14--

(And he said: "My presence will go with you,  
 and I will give you rest.")

wayyōmar            pānay            yelēkū            wahāniḥōtī            lak

< ( /v\ ) M ( [ ( /\ ) M ( /y\ ) ] ± [ ( /y\ ) M ( /\ ) ] ) >

A clausal sub-member in non-serial coordinate relation with its (preceding) fellow is a relative clause.

For example:

Gen.2.2--

(And he rested on the seventh day  
from all his work **which he had done.**)

wayyishbōt bayyôm haššēbi'î  
mikkol mēla'ktô 'āser 'asah

( ( /v\ ) MM ( / = / ) M  
( [ -/ ] = [ ( -/v\ ) ] ) )

There are also clauses which can be analyzed as sub-  
members subordinate to a preceding sub-member. For  
example:

Num.3.1--

(...at the time when the LORD spoke with Moses  
on Mount Sinai.)

...bēyôm dibber YHWH 'et mōšeh bēhar sīnāy

MM ( [ / ] \* [ ( ( /v\ ) M ( / ) M (-/) MM ( /+ / ) ] ) )

1.44 The distinction between restrictive and non-  
restrictive seems to hold when one of two non-serial  
coordinate sub-members is clausal. The first independent  
clause of Gen.2.22, for example, contains a non-restrictive  
relative clause within it: "And the LORD God fashioned the  
rib, which he had taken from the man, into a woman..." The  
members of the matrix clause are :

wayyiben  
 YHWH 'ēlōhîm  
 'et hassēlā' 'āser lāqah min hā'ādām  
 lē'issāh...

The parsing of these members can be schematically represented as follows:

( ( /v\ )  
 M ( / = / )  
 M ( [ -/ ] = [ ( ( -/v\ ) M ( -/ ) ) ] )  
 M ( / ) )

For purposes of illustration, the words of the translation can be squeezed into this schema:

( (and-fashioned)  
 M (the-LORD = God)  
 M ([the-rib] = [(which-he-had-taken) M (from-the-man) ]])  
 M (into-a-woman) )

In this schema, which is the point of departure for the distribution of the accents, relative clause and antecedent are grouped together. After the phrasing rules have operated, this is no longer so. The phrasing rules have dissolved the non-restrictive coordinate bond and re-grouped the sub-members originally held together by that bond. In the more abstract bracketing onto which the countdown is mapped, relative clause and antecedent have become separate units:



[ [ Δ ]  
 [ Δ Δ ]  
 [ -Δ ]  
 [ -Δ -Δ ]  
 [ Δ ] ]

[ [and-fashioned]  
 [the-LORD God]  
 [the rib]  
 [~~which-he-had-taken from-the-man~~]  
 [into-a-woman] ]

The coalescence of the first three members into one accentual group (ending with a disjunctive and with only conjunctive accents within the group) results later, from the operation of the pacing rules. It does not concern us here. (See rule 4.3a on p.201.)

Detachment of a relative clause from its antecedent, as above, does not occur when the bond between them is restrictive. The first clause of Ex.4.30, for example, contains such a restrictive relative clause: "And Aaron spoke all the words which the LORD had spoken to Moses..." The members of this clause and its schematic parsing are as follows:

waydabbēr  
 'ahārōn  
 'Ēt kol-naddēbarîm 'ăšer dībber YHWH 'el-mōšeh

( ( ΔΔ )  
 M ( Δ )  
 M ( [ --Δ ] = [ ( (-ΔΔ ) M ( Δ ) M ( Δ ) ) ] ) )

( (and-spoke)  
 M (Aaron)  
 M ([all-the-words]=[[**(which-had-spoken)** (LORD) (to Moses)]]])

In this case, the phrasing rules do not affect the grouping of the relative clause with its antecedent. The countdown is mapped onto the following bracketing that emerges from the phrasing rules:

[ [  $\Delta$   $\Delta$  ]  
 [ [ -- $\Delta$  ] [ [- $\Delta$   $\Delta$  ] [- $\Delta$  ] ] ] ]

[ [and-spoke Aaron]  
 [ [all-the-words] [ **[which-spoke LORD]** [to-Moses] ] ] ]

The coalescence of the first two members is the result of a phrasing rule which unites a verb with an immediately following one-word member. It does not concern us here. (See rule 2.27 on p.188.)

A distinction between restrictive and non-restrictive syntactic bonding has been posited for non-clausal coordinate sub-members in Masoretic Hebrew (see section 1.26.) Moreover, the distinction between restrictive and non-restrictive relative clauses is well-established in traditional grammatical studies. It has therefore seemed reasonable to posit a distinction between restrictive and non-restrictive relative clauses in Masoretic Hebrew to account for the different accentual groupings of verses such as Gen. 2.22 and Ex. 4.30 above.

Clear instances of this last distinction are not abundant, however, and they are not easily isolated. The

reason for this difficulty is that, in most instances, the underlying semantic distinction between restrictive and non-restrictive relative clauses is neutralized by non-semantic factors of word-count and clause-position. Thus:

A minimal relative clause (consisting simply of 'ašer and one other word) is never grouped separately from a one-word antecedent, even if, on semantic grounds, it seems to be perfectly separable; that is, even if separation would not have a false, misleading or confusing effect. (See section 2.12a.)

A one-word antecedent is always separated from a more-than-minimal relative clause, restrictive or non-restrictive, if the antecedent immediately follows the verb of the main clause and if the member to which the antecedent and the relative clause belong is not marginal. (See section 2.21a.)

No antecedent is ever separated from its relative clause if, between the member to which they both belong and the main clause's verb, two or more other members intervene. (See section 2.24, in which, after flattening has taken place in the first and second post-verbal external members, the bond between antecedent and relative clause is deleted for all members, making further detachments of sub-members impossible.)

All of these syntactic situations will be illustrated later, in the sections cited. For the present, what matters is that the accentual distinction between restrictive and non-restrictive relative clauses can be observed only under certain conditions: when the member to which the clause belongs is not marginal; and when, between that member and the main clause's verb, one other non-marginal member intervenes. This is the case with the two examples (Gen.2.22 and Ex.4.30) offered above.

1.46 In their operation upon embedded serially coordinate clauses, the phrasing rules can also be described as recognizing a distinction between restrictive and non-restrictive. Two verses quoted in 1.43 illustrate this contrast. In both Ex.33.14 and Num.23.16, two serially coordinate clauses jointly serve as object of a verb of saying. Phrasing rules separate the two object-clauses of Num.23.16. The accentual grouping that emerges from the phrasing rules is as follows:

[wayyōmer]	and he said
[šûb 'el-bālāq]	return to Balak
[wĕkōh tĕdabbēr]	and thus speak

By contrast, the phrasing rules do not affect the grouping of the two object-clauses in Ex.33.14. They remain together, as follows:

[wayyōmar]	and he said
[ [pānay yēlēkû]	my presence will go
	with you
[wahāniḥōtî lāk] ]	and I will give you
	rest

The above examples suggest, however, that notation of the restrictivity or non-restrictivity of the relation between serially coordinate clauses is, in fact, redundant: this distinction seems simply to be a function of the kind of word that begins the second of two coordinate clauses. The relation between coordinate object-clauses is "restrictive" when the second clause begins with a verb (like wahāniḥōtî in Ex.33.14); it is "non-restrictive" when the second clause begins with something other than a verb (like the adverb wēkōh in Num.23.16).

It turns out, therefore, that a syntactic distinction that must be made here for the sake of deriving the correct accentual grouping of embedded serially coordinate clauses is equivalent to a distinction that has been made before for the sake of sorting out the various meanings that can be indicated in Biblical Hebrew by the joining of clauses with we- ("and"): Lambdin has convincingly argued that a clause that begins with we + verb is "temporally or logically posterior or consequent" to the preceding clause, and that this is not the case for a clause that begins with we + non-verb.

See Lambdin, section 132. Lambdin's terms "conjunctive" and "disjunctive" correspond respectively to my "restrictive" and "non-restrictive" above. In the context of the present study, his usage would, of course,

be quite confusing, since it has nothing to do with the use of the terms "conjunctive" and "disjunctive" as they are applied to the Masoretic accents.

For more on the accentual grouping of serially coordinate clauses, see below the discussions of rules 2.25b and 2.26b.

## 2. PHRASING RULES

### 2.0 Preliminary explanation

As formulated below, the rules of section 2 are of two kinds. On the one hand, there are rules of de-grouping (removal of brackets) and re-grouping (insertion of brackets). These are the effective phrasing rules, which actually alter the underlying grouping of words. (2.11a below is, for example, an effective phrasing rule.)

On the other hand, there are "helper" phrasing rules: rules that delete or change the symbols which characterize the syntactic bonds between words and word-groups. These helper rules do not in themselves affect the grouping of words. Rather, they eliminate information that is superfluous for subsequent rules. In this way, the helper rules facilitate the statement of effective phrasing rules that follow. (2.12a below is, for example, a helper phrasing rule.)

Phrasing rules (that is, the whole set of the rules of section 2, including both effective and helper phrasing rules) are ordered and can be described as cyclical, operating first on the innermost (most highly embedded) clauses and then moving successively outward from matrix clause to matrix clause. Within each clause, the phrasing rules operate first on intra-member relations and then on inter-member relations.

Accordingly, the operation of the phrasing rules presupposes a parsing that distinguishes word-groupings according to whether they constitute clauses, members or sub-members. One of the chief effects of the phrasing rules, however, is to remove bracketing and thereby flatten hierarchical structure. This flattening operation is, of course, conditioned by distinctions which the parsing makes, but, in removing brackets, the phrasing rules efface those very distinctions. The output of the phrasing rules -- the derived bracketing onto which the accents are to be mapped -- is simpler and, in a sense, more abstract than the original parsing. Whereas the input to the phrasing rules is a hierarchical structure, the output is a linear sequence, not of clauses and clause-members, but simply of phrases. (The cadencing rules, which follow the phrasing rules, are conditioned by this linear output; they operate almost wholly without reference to grammatical categories such as clause and clause-member.)

Flattening (de-grouping) is one of the two principal effects of the phrasing rules. It seems to make utterance more perspicuous by reducing what is complex and hierarchical to a simpler linear form. The other principal effect of the phrasing rules is re-grouping, which seems to promote perspicuity in another way: it prevents or at least reduces the isolation of a governing word (a verb or a noun in construct state) from that which it governs. Whereas a flattening rule (such as 2.13a) detaches the components of the governed word-group from each other, a re-grouping rule (such as 2.13b) attaches the first of those components to the governing word.

Rules 2.13a and 2.13b are on the intra-member level; other rules flatten and re-group on the inter-member level (such as 2.21a for flattening and 2.27 for re-grouping).

Attachment of a governing word to the first part of what it governs is the most important cause of the syntactic incongruity (see section 4 of chapter 2) which has been such a puzzle to students of the Masoretic accents. It seems to be a kind of compromise between two desiderata of utterance: manageable phrasing on the one hand, and conveyance of syntactic information on the other.

What is achieved in the phrasing rules by the attachment of a governing word to the first part of what it governs is similar to what is achieved in parsing by the use of restrictivity, which inhibits detachment. (See section 1.26.) In opposition to the tendency toward detached manageable phrases, both devices help preserve



information necessary to the understanding of relations among words and word-groups. A breach of the relationship between restrictive coordinates can falsify or mislead; a breach of the relationship between governing and governed can be syntactically confusing.

Re-grouping, i.e., the insertion of brackets, also serves another purpose: the avoidance of staccato phrasing. This is most obvious in the treatment of unstructured lists (see rule 2.11), which are grouped into pairs rather than left to be recited item by item. The attachment of a single governing word to part of what it governs also serves this purpose, in addition to the purpose described just above. (Like most linguistic phenomena, this device is over-determined.)

As used in the phrasing rules, a "word" is a phraseable word.  $\Delta$ ,  $-\Delta$ ,  $--\Delta$  (and so forth) are each treated as one phraseable word by the phrasing rules. The symbol  $\Delta$  as used in the phrasing rules may stand for any phraseable word.

Rules (as opposed to discussion of rules and examples of their operation) will appear in boldface.

## **2.1 Intra-member phrasing**

**2.10 Relatively few members of relatively few verses require any internal rearrangement. The underlying**

bracketing even of rather complex members is generally left undisturbed by the intra-member phrasing rules.

This is so, for example, of such a member as the following in Ex.40.6 ("before the door of the tabernacle of the tent of meeting"):

lipnê            petah            miškan            'ōhel mō'ēd  
 ( [ Δ ] \* [ [ Δ ] \* [ [ Δ ] \* [ Δ \* Δ ] ] ] )

After the phrasing rules have operated on this member, its bracketing is the same (as will be plain when those rules have been spelled out). The only difference is that the bond symbols have been deleted:

( [ Δ ] [ [ Δ ] [ [ Δ ] [ Δ Δ ] ] ] )

This is also the case for a member such as this in Lev.23.13 ("two tenths of fine flour mixed with oil"):

šerê 'esrōrîm      sōlet      bēlūlāh baššemer...  
 ( [ Δ \* Δ ] = [ [ Δ ] ≡ [ Δ @ Δ ] ] )

After the phrasing rules have operated, the bond symbols have been deleted, but the bracketing is the same:

[ [ Δ Δ ] [ [ Δ ] [ Δ Δ ] ] ]

The principal need for intra-member phrasing rules is in connection with coordinate relations among sub-members. When there are relatively many coordinate sub-members, they need to be grouped. When there are even two, but those two are governed (especially by a noun in construct state) or

are in restrictive apposition with another word (or words), re-grouping is needed.

Defining a few terms in advance will facilitate the formulation of the intra-member phrasing rules:

An indivisible sub-member is one that contains no bond symbols within it. For example, [  $\Delta$  ] and [  $\Delta$   $\Delta$  ] are indivisible; [  $\Delta$  \*  $\Delta$  ] and [  $\Delta$  +  $\Delta$  ] are not indivisible.

A list is a sequence of one-word sub-members that are connected by + and by no other bond symbol. A grouped list such as [  $\Delta$  +  $\Delta$  ] + [  $\Delta$  +  $\Delta$  ] + [  $\Delta$  ] could come straight from parsing or it could be the result of 2.11a, which will already have applied to all ungrouped lists.

Two words are paired if they are bracketed together and are separated by no brackets. [  $\Delta$  =  $\Delta$  ] and [  $\Delta$  \*  $\Delta$  ] and [  $\Delta$   $\Delta$  ] are all pairs.

The principal bond of a member or sub-member is the bond between its immediate constituents. For example, the principal bond of the sub-member [ [  $\Delta$  ] = [  $\Delta$  \*  $\Delta$  ] ] is = . There may be more than one principal bond. For example, in the sub-member [ [  $\Delta$  \*  $\Delta$  ] + [  $\Delta$  =  $\Delta$  ] + [  $\Delta$  ] ], each + is a principal bond.

**2.11a If a sequence of indivisible coordinate sub-members is ungrouped, group the sequence by bracketing its sub-members into pairs starting from the left.**

For example:

(  $\Delta = \Delta = \Delta = \Delta$  ) becomes ( [  $\Delta = \Delta$  ] = [  $\Delta = \Delta$  ] )

(  $\Delta + \Delta + \Delta$  ) becomes ( [  $\Delta + \Delta$  ] +  $\Delta$  )

2.11a corresponds to the "first list-phrasing rule" of chapter II, section 5.

**2.11b If a list has more than two items, group them by twos starting from the right.**

Since 2.11a has already applied, the only lists that 2.11b can apply to are lists that are already grouped into pairs, either as a result of 2.11a or because they were so grouped in the underlying parsing.

2.11b corresponds to the "second list-phrasing rule" of chapter II, section 5.

For example:

( [  $\Delta + \Delta$  ] + [  $\Delta + \Delta$  ] + [  $\Delta$  ] )

becomes

( [  $\Delta + \Delta$  ] + [ [  $\Delta + \Delta$  ] + [  $\Delta$  ] ] )

**2.12a If two words are paired and the bond between them is other than + or @@, delete the bond.**

Thus:

[  $\Delta$  b  $\Delta$  ] becomes [  $\Delta$   $\Delta$  ]

where b is a complete (not "partial") subordinate bond or a non-serial coordinate intra-member bond or a restrictive serial bond (i.e., where b is \* @ = ≡ or †).

Later rules will effectively dissolve bonds between words and "de-group" them. Such rules are triggered by the presence of bond symbols that follow closely after a verb or after a noun in construct state. The pairs of words specified in 2.12a are insulated, by the deletion of the bond symbol, from those later bond-dissolving rules: there is a strong tendency to keep pairs of words together, regardless of the larger syntactic environment. Exceptions to this tendency are those pairs which have been combined from deep structures neither of which is subordinate to the other. The exceptions are, in other words, those pairs of words with a bond + or @@ . (See the discussion of "partial subordination in section 1.24.)

**2.12b If the bond between two paired words is + , change the bond from + to & .**

Unlike other pairs of words, serial pairs are not indivisible: they can be de-grouped in certain syntactic situations. Nevertheless, the bond between them -- represented by the symbol & -- is closer than a serial bond between words which are not paired. Words connected by & are insulated from certain bond-dissolving rules to which words connected by + are subject.

The importance of the distinction between & and + emerges in the inter-member phrasing rules. (The special nature of the & bond figures explicitly in 2.21a and implicitly in 2.23c.)

**2.13a** When the sub-member to the left of any \* is a single word --

if the principal bond of the sub-member to the right is non-restrictive coordinate, then make that principal bond restrictive and delete the brackets that enclose it;

if the principal bond of the sub-member to the right is Z, simply delete the brackets that enclose it.

Repeat where appropriate.

The principal bond of the sub-member to the right can be Z if that sub-member consists of an embedded clause on which the whole cycle of operating rules has already operated. See rules 2.21a, 2.22a and 2.23a-d below for the introduction of Z into accentual derivations. See the derivation of Gen. 1.1 in appendix C for an example of the application of this rule to a sub-member that contains Z.

This rule applies, for example, to the third member of the first clause of Ex. 3.1 ("the flocks of Jethro his father-in-law, the priest of Midian"):

'et šō'n      yitrô      ḥōtēnô      kōhēn midyār  
 ( [ △ ] \* [ [ △ ] = [ △ ] = [ △ \* △ ] ] )

by 2.11a ( [ △ ] \* [ [ △ = △ ] = [ △ \* △ ] ] )

by 2.12a ( [ △ ] \* [ [ △ △ ] = [ △ △ ] ] )

by 2.13a ( [ △ ] \* [ △ △ ] = [ △ △ ] )

The possibility of repetition of this rule shows up, for example, in a sub-member of Ex. 3.17 ("to the land of the Canaanite and the Hittite, and of the Amorite and the Perizzite, of the Hivite and the Jebusite"):

[ [-△] \* [ △ + △ + △ + △ + △ + △ ] ]

by 2.11a and 2.11b--

[ [-△] \* [ [ △ + △ ] + [ [ △ + △ ] + [ △ + △ ] ] ] ]

by 2.12b--

[ [-△] \* [ [ △ & △ ] + [ [ △ & △ ] + [ △ & △ ] ] ] ]

by 2.13a (first time)

[ [-△] \* [ △ & △ ] + [ [ △ & △ ] + [ △ & △ ] ] ]

by 2.13a (second time)

[ [-△] \* [ △ ] & [ △ ] + [ [ △ & △ ] + [ △ & △ ] ] ]

**2.13b If the sub-member to the left of any \* is a single word, and if the sub-member to the right is indivisible, then bracket those two sub-members together and delete the bond symbol \* .**

As applied to the parts of Ex.1.3 and Ex.3.17 that served as examples above, 2.13b works as follows:

( [ △ ] \* [ △ △ ] ≡ [ △ △ ] )

becomes

( [ [ △ ] [ △ △ ] ] ≡ [ △ △ ] )

[ [-△] \* [ △ ] & [ △ ] + [ [ △ & △ ] + [ △ & △ ] ] ]

becomes

[ [-△ △ ] & [ △ ] + [ [ △ & △ ] + [ △ & △ ] ] ]

2.14a When the sub-member to the left of any  $\equiv$  is a single word --

if the principal bond of the sub-member to the right is non-restrictive coordinate, then make that principal bond restrictive and delete the brackets that enclose the right sub-member;

if the principal bond of the sub-member to the right is Z, simply delete the brackets that enclose it.

Repeat where appropriate.

2.14b If the sub-member to the left of any  $\equiv$  is a single word, and if the sub-member to the right is indivisible, then bracket those two sub-members together.

These rules apply, for example, to a sub-member of Ex. 3.17 ("to a land flowing with milk and honey"):

'el 'eres      zābat      ḥālāb ûdēbāš  
 [ [-△] ] ≡ [ [ △ ] \* [ △ + △ ] ] ] ]

by 2.12b [ [-△] ] ≡ [ [ △ ] \* [ △ & △ ] ] ] ]

by 2.13a [ [-△] ] ≡ [ [ △ ] \* [ △ ] & [ △ ] ] ] ]

by 2.13b [ [-△] ] ≡ [ [ △ △ ] & [ △ ] ] ] ]

by 2.14a [ [-△] ] ≡ [ △ △ ] & [ △ ] ] ]

by 2.14b [ [ [-△] ] ] ≡ [ △ △ ] ] & [ △ ] ] ]

2.15 Bracket together sub-members that are immediately to the left and right of & or  $\underline{\&}$ .



This rule applies to the sub-members from Ex.3.17 as follows:

$$\left( \left[ \left[ -\Delta \Delta \right] \& \left[ \Delta \right] \pm \left[ \left[ \Delta \& \Delta \right] \pm \left[ \Delta \& \Delta \right] \right] \right) \\ = \left( \left[ \left[ -\Delta \right] \left[ \Delta \Delta \right] \right] \& \left[ \Delta \right] \right)$$

becomes

$$\left( \left( \left[ \left[ -\Delta \Delta \right] \& \left[ \Delta \right] \right] \pm \left[ \left[ \Delta \& \Delta \right] \pm \left[ \Delta \& \Delta \right] \right] \right) \right) \\ = \left( \left[ \left[ -\Delta \right] \equiv \left[ \Delta \Delta \right] \right] \& \left[ \Delta \right] \right)$$

This rule will usually be superfluous, since, for the most part, the sub-members immediately to the right and left of & or & are already bracketed together. In this example, only the first application of the rule is not redundant.

After 2.15, all intra-member re-arrangement has been completed. Only certain intra-member bonds play a role in inter-member phrasing; the others can be deleted. Rules 2.16a through 2.16d are helper rules which do this work of deletion.

**2.16a Delete any & or & that is not the principal bond of its member.**

This rule applies, for example, to Gen.10.26 ("And Yoqtan begat Almodad and Sheleph, and Hazarmaveth and Yerah."):

		'et		wě'et	wě'et		wě'et
weyoqtān	yālad	'almôdād	šālep	hāṣarmāwet	yārah		
( ( ΔΔ ) M	( ΔΔΔ ) M	( -ΔΔ + -ΔΔ	+ -ΔΔ	+ -ΔΔ	+ -ΔΔ )		

by 2.11a

( (  $\Delta$  ) M (  $\Delta$ v $\Delta$  ) M ( [ - $\Delta$  + - $\Delta$  ] + [ - $\Delta$  + - $\Delta$  ] ) )

by 2.12b

( (  $\Delta$  ) M (  $\Delta$ v $\Delta$  ) M ( [ - $\Delta$  & - $\Delta$  ] + [ - $\Delta$  & - $\Delta$  ] ) )

by 2.16a

( (  $\Delta$  ) M (  $\Delta$ v $\Delta$  ) M ( [ - $\Delta$  - $\Delta$  ] + [ - $\Delta$  - $\Delta$  ] ) )

**2.16b 1) Remove the restrictivity of any  $\equiv$  that outranks another  $\equiv$  within the same member or sub-member.**

**2) Delete any  $\equiv$  that is not the principal bond of its member.**

The second part of this rule operates frequently. It applies, for example, to the third member of the first clause of Gen.27.15 ("the best garments of Esau her older son, which were with her in the house"):

'et bigdê 'ēsāw bērah haggādōl mudōt 'ittāh babbāyit  
( [ [- $\Delta$ ] \* [ [ $\Delta$ ]  $\equiv$  [ $\Delta$  =  $\Delta$ ] ] ] = [ $\Delta$ ] = [- $\Delta$   $\Delta$ ] )

Note that the last part of this member is a relative clause. The schematic representation of the member given above presupposes that the whole cycle of phrasing rules has already operated on that relative clause. [- $\Delta$   $\Delta$  ], representing the relative clause, is the product of that prior cycle.

by 2.12a

( [ [- $\Delta$ ] \* [ [  $\Delta$  ]  $\equiv$  [  $\Delta$   $\Delta$  ] ] ] = [  $\Delta$  ] = [- $\Delta$   $\Delta$  ] )

by 2.13a

( [ [-△] ] \* [ △ ] ≡ [ △ △ ] ] = [ △ ] = [-△ △ ] )

by 2.13b

( [ [-△ △] ] ≡ [ △ △ ] ] = [ △ ] = [-△ △ ] )

by 2.16b

( [ [-△ △] ] [ △ △ ] ] = [ △ ] = [-△ △ ] )

Both parts of this rule are illustrated in the rearrangements of a member of Gen.29.10 ("Rachel, the daughter of Laban, his mother's brother, and the sheep of Laban, his mother's brother"):

'et rāḥēl bat lābān 'āḥî 'immô  
( [ [-△] ] ≡ [ [-△] ] ≡ [ △ \* △ ] ] )  
wě't-ṣō'rî lābān 'āḥî 'immô  
+ [ [-△] ] \* [ [ △ ] ] ≡ [ △ \* △ ] ] )

by 2.12a

( [ [-△] ] ≡ [ [-△] ] ≡ [ △ △ ] ] ]  
+ [ [-△] ] \* [ [ △ ] ] ≡ [ △ △ ] ] )

by 2.13a

( [ [-△] ] ≡ [ [-△] ] ≡ [ △ △ ] ] ]  
+ [ [-△] ] \* [ △ ] ≡ [ △ △ ] ] )

by 2.13b

( [ [-△] ] ≡ [ [-△] ] ≡ [ △ △ ] ] ]  
+ [ [-△ △] ] ≡ [ △ △ ] ] )

by 2.16b

( [ [-△] ] = [ [-△] ] [ △ △ ] ] ]  
+ [ [-△ △] ] [ △ △ ] ] )

**2.16c Delete \* and †.**

For example:

Ex.5.1 ("And afterwards Moses and Aaron went")

we'ahar            bā'û            mōseh we'ahārōn  
( ( △ ) MM ( √ ) M ( △ † △ ) )

becomes

( ( △ ) MM ( √ ) M ( △ △ ) )

Ex.33.14 (And he said: "My presence will go with you,  
and I will give you rest.")

wayyōmar            pānay yēlēkû    wahārihōtî lāk  
( ( √ ) M ( [ △ √ ] † [ √ △ ] ) )

(The above represents a derivational stage  
when all the phrasing rules have operated  
on the subordinate clauses.)

( ( √ ) M ( [ △ √ ] [ √ △ ] ) )

Gen.1.12 ("a crop of grass yielding seed for its kind and  
of fruit-trees bearing fruit with its seed in it  
for its kind"):

dešē'            'ēšeb            mazrîa' zera'    lēmînehû  
( [ [ [ △ ] \* [ [ △ ] = [ △ △ ] ] ] @ [ △ ] ]  
+ [ [ [ △ ] = [ △ △ ] = [-△ △ ] ] @ [ △ ] ] )

by 2.11a

( [ [ [ [ Δ ] \* [ [ Δ ] ≡ [ Δ Δ ] ] ] @ [ Δ ] ] ]  
+ [ [ [ [ Δ ] = [ Δ Δ ] ] ] = [ -Δ Δ ] ] @ [ Δ ] ] )

by 2.12a

( [ [ [ [ Δ ] \* [ [ Δ ] [ Δ Δ ] ] ] @ [ Δ ] ] ]  
+ [ [ [ [ Δ ] [ Δ Δ ] ] ] = [ -Δ Δ ] ] @ [ Δ ] ] )

by 2.16c

( [ [ [ [ Δ ] [ [ Δ ] [ Δ Δ ] ] ] @ [ Δ ] ] ]  
+ [ [ [ [ Δ ] [ Δ Δ ] ] ] = [ -Δ Δ ] ] @ [ Δ ] ] )

**2.16d Delete all bond symbols in members that precede the verb of their clause.**

Pre-verbal members are not susceptible to the de-grouping and re-grouping that inter-member phrasing rules will effect. All the internal bonds of pre-verbal members can therefore be deleted.

**2.17 Change parentheses to brackets.**

In the parsing which is the point of departure for these rules of derivation, parentheses mark the beginnings and ends of clause-members. 2.15 is the last effective intra-clause member rule. From here on, the rules do not need to recognize the beginnings and ends of members.

2.2 Inter-member phrasing

2.21a 1) If the first external member that follows a verb is central and divisible, and its principal bond is other than & ,

delete the brackets around the member.

2) If the first external member that follows a verb is central and divisible, and its principal bond is & but it is not followed by another member containing only one word,

delete the brackets around the member.

2.21a is the first of two flattening rules which do on the inter-member level the sort of thing that 2.13a and 2.14a do on the intra-member level. The second inter-member flattening rule is 2.22a below.

Rule 2.21a affects central members in the following positions with respect to the verb:

[ ∇ ] M [   ]  
[ ∇ ] m [   ] M [   ]

This rule does not affect a central member unless it is the first external member to follow its verb. In other words, it does not affect central members in the following positions:

[ /v\ ] M [ ] M [ ]  
 [ /v\ ] MM [ ] M [ ]

Rule 21.21a applies as follows to Gen. 10.15 ("And Canaan begat Şidon his first-born and Heth."):

ûkēna'anî yālad 'et şîdōnî bēkōrō wē'et hēt  
 < [ /\ ] M [ /v\ ] M [ [ /\ /\ ] + [ /\ ] ] >

becomes

< [ /\ ] M [ /v\ ] M [ /\ /\ ] + [ /\ ] >

In the above example, the serial coordinate + is the principal bond of the member to be flattered. The non-serial coordinate = is the principal bond of the affected member of the first clause of II Ki. 15.25 ("And there conspired against him Pekah the son of Remaliah, his captain"):

wayyiqšōr 'ālāw peqah rēmalyāhū šālîšō  
 < [ /v\ ] m [ /\ ] M [ [ /\ -/\ ] = [ /\ ] ] >

becomes

< [ /v\ ] m [ /\ ] M [ /\ -/\ ] = [ /\ ] >

Here an internal member comes between the verb and the first external member, but the flattering rule still applies.

Another example of a non-serial coordinate bond which is breached by 2.21a is found in IKi. 11.1 ("King Solomon

loved many foreign women in addition to Pharaoh's daughter  
 -- Moabite, Ammonite and Edomite women, Sidonian and  
 Hittite women."):

wēham-  
 melek šelōmōh 'āhab                      rāšîm                      wē'et  
 < [ [ Δ Δ Δ ] M [ √Δ ] M [ [ [ [ Δ Δ Δ ] [Δ] ] + [--Δ ] ] ]

mô'ābivyôt 'ammōniyyôt 'adōmiyyôt šēdniyyôt ḥittiyyôt  
 = [ [ [ Δ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ ] ] ] )

becomes

< [ [ Δ Δ Δ ] M [ √Δ ] M [ [ [ Δ Δ Δ ] [Δ] ] + [--Δ ] ] ]  
 = [ [ [ Δ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ ] ] )

This list of the women Solomon loved is not an unstructured list. It seems to reflect the geography of the nations to which the women belonged: Moabites, Ammonites and Edomites to the East, Hittites and Sidonians to the North.

Rule 2.21a (unlike 2.22a below) affects even members whose principal bond is restrictive, as in the first clause of Ex.3.1 ("And Moses was keeping the flock of Jethro, his father-in-law, the priest of Midian"):

ūmōseh hāyāh rō'eh 'et šō'r    yitrô hōtērô kōhēn midyān  
 < (ΔΔ) M (-√ΔΔ) M ( [-ΔΔ] \* [ [ΔΔ] ≡ [ΔΔ] = [ΔΔ\*ΔΔ] ] ) )

becomes (by 2.11a, 2.12a, 2.13a/b, 2.17)

< [ [ Δ Δ ] M [-√ΔΔ ] M [ [ [-ΔΔ ] [ Δ Δ Δ ] ] ≡ [ Δ Δ Δ ] ] )

becomes by 2.21a

< [ [ Δ Δ ] M [-√ΔΔ ] M [ [-ΔΔ ] [ Δ Δ Δ ] ] ≡ [ Δ Δ Δ ] )

See appendix A for a step-by-step derivation of the intra-member phrasing.



Rule 2.21a applies to most members in which & is the principal bond, as in the first clause of Ex.40.12 ("And you shall bring Aaron and his sons to the door of the tent of meeting"):

'et wě'tet  
wěhiqrabtā 'ahārōn bānāw 'el petah 'ōhel mō'ēd  
< [ /v\ ] M [ -\ \ ] & [ -\ \ ] MM [ [ -\ \ ] [ \ \ ] ] >

becomes

< [ /v\ ] M [ -\ \ ] & [ -\ \ ] MM [ [ -\ \ ] [ \ \ ] ] >

Rule 2.21a also applies, for example, to the first clause of Gen.1.2 ("And the earth was formless and void"):

wěhā'āreš hāyētāh tōhū wābōhū  
< [ \ \ ] M [ /v\ ] M [ \ \ ] & [ \ \ ] >

becomes

< [ \ \ ] M [ /v\ ] M [ \ \ ] & [ \ \ ] >

It applies similarly to the last clause of Gen.5.4 ("and he begat sons and daughters"):

wayyōled bānīm ūbānōt  
< [ /v\ ] M [ \ \ ] & [ \ \ ] >

becomes

< [ /v\ ] M [ \ \ ] & [ \ \ ] >

The rule is blocked, however, when a member with & is followed by a one-word member, as in the second clause of Gen.31.17 ("and he set his sons and his wives on camels"):

wayyissā' 'et bārîaw wē'et nāšaw 'al haggemallîm  
 < [ /v\ ] M [-\ ] & [-\ ] MM [-\ ] >

The rule is similarly blocked in the first clause of  
 II Ki.17.17 ("And they passed their sons and daughter  
 through the fire"):

wayya'ăbîrû 'et wē'et  
 bēnehem bēnôtêhem bā'ēs  
 < [ /v\ ] M [ \ ] & [ \ ] M [ \ ] >

Why is this rule blocked by a following  
 one-word member? If it were not blocked,  
 the result would be four one-word members  
 in a row. Such a sequence would impede the  
 flow of the utterance. It might also, not  
 unrelatedly, lead to semantic confusions:  
 the final adverb might be heard as having  
 to do with the second object rather than  
 with both of the objects of the verb.

Phrasing rule 2.21a leaves intra-member bonds  
 "exposed": that is, like the inter-member bonds ( m , M ,  
 MM ), they are enclosed by no brackets, but only by the  
 "elbows" that enclose the entire clause.

**2.21b Change exposed + = or = to Z if no intra- or  
 inter-member bond other than + or Z follows within the  
 clause; change any remaining exposed intra-member bond to  
 M .**

The effect of 2.21b on the verses that illustrated  
 2.21a above is as follows:

Gen. 10. 15 --

< [ Δ ] M [ √Δ ] M [ Δ Δ ] + [ Δ ] >

becomes

< [ Δ ] M [ √Δ ] M [ Δ Δ ] Z [ Δ ] >

IKi. 15. 25 --

< [ √Δ ] m [ Δ ] M [ Δ -Δ ] = [ Δ ] >

becomes

< [ √Δ ] m [ Δ ] M [ Δ -Δ ] Z [ Δ ] >

IKi. 11. 1 --

< [ Δ Δ ] M [ √Δ ] M [ [ Δ Δ ] [Δ] ] + [ --Δ ] ]  
= [ [ Δ Δ ] + [ Δ ] ] + [ Δ Δ ] >

becomes

< [ Δ Δ ] M [ √Δ ] M [ [ Δ Δ ] [Δ] ] + [ --Δ ] ]  
Z [ [ Δ Δ ] + [ Δ ] ] + [ Δ Δ ] >

Ex. 3. 1 --

< [ Δ ] M [ -√Δ ] M [ [-Δ] [ Δ Δ ] ] ≡ [ Δ Δ ] >

becomes

< [ Δ ] M [ -√Δ ] M [ [-Δ] [ Δ Δ ] ] Z [ Δ Δ ] >

Ex. 40. 12 --

< [ √Δ ] M [-Δ] & [-Δ] MM [ [-Δ] [ Δ Δ ] ] >

becomes

< [ √Δ ] M [-Δ] M [-Δ] MM [ [-Δ] [ Δ Δ ] ] >

Gen. 1.2 --

< [ Δ ] M [ √Δ ] M [ Δ ] & [ Δ ] >

becomes

< [ Δ ] M [ √Δ ] M [ Δ ] M [ Δ ] >

The full significance of designating certain syntactic junctures with the symbol "Z" (introduced here in 2.21b and below in 2.22b and 2.23) will emerge only later (in 2.26a and 2.26b) in the determination of how pre-verbal members are to be grouped with respect to the rest of their clauses. It may be helpful, however, to anticipate that later development here and show, at least partially, how the introduction of "Z" helps determine correct accentual grouping.

The use of the symbol "Z" is suggested by Wickes' use (p.45) of the German word "Zusatz", which he introduces into his exposition to give a name to the frequent phenomenon of a "supplemental appendage" to a clause. With this notion, Wickes is getting at something interesting and important, but he does not attempt to define it exactly or systematically. The use of the symbol "Z" in the present derivation rules will define this syntactic category as it affects Biblical Hebrew accentuation.

A further look at two of the examples used to illustrate 2.21a and 2.21b above can make the point:

Gen. 10. 15 --

ûkēna'an yālad 'et šidōn bēkōrō wē'et ḥēt  
< [ △ ] M [ √ ] M [ △ △ ] Z [ △ ] >

Ex. 3.1 --

ûmōšeh hāyāh rō'eh 'et šō'n yitrō hōtēnō kōhēn midyār  
< [ △ ] M [ -√ ] M [ -△ ] [ △ △ ] Z [ △ △ ] >

The ultimate accentual grouping of these two clauses  
can be conveyed in translation as follows:

[And Canaan]  
[ [begat] [Šidon his first-born] ]  
[and Ḥeth]

[And Moses]  
[ [was keeping] [ [the flock of] [Jethro his father-in-law] ]  
[the priest of Midian]

The accentual breaks after "first-born" and "father-  
in-law" correspond to the presence of Z . The  
"syntactic incongruity" of such breaks is only apparent,  
since Z is syntactically determined (i.e., the rules  
which insert Z are part of a sequence of rules that takes  
a parsing of the text as its basis and point of  
departure).

Apparent incongruity between accentual  
(intonational) grouping and underlying  
syntactic grouping was discussed in a  
general way in chapter II, section 5  
(especially pp. 46-55). Here and below,  
this phenomenon is systematically defined  
by specific rules in a derivation  
procedure.

It is the presence of pre-verbal members which  
requires the recognition of the syntactic category which Z

defines. The definition of Z is set by rules 2.21 through 2.23. Rules 2.26a and 2.26b will show why that definition is needed.

Rule 2.21a/b can apply twice in the same clause. An example of such repetition is IKi.11.1 ("King Solomon loved many foreign women in addition to Pharaoh's daughter -- Moabite, Ammonite and Edomite women, Sidonian and Hittite women."): :

wèham-     rišîm     wé'et  
melek šelômôh 'āhab     nokriyyô<sup>t</sup> rabbô<sup>t</sup> bat par'ôh  
< [ [ Δ Δ ] M [ √Δ ] M [ [ [ Δ Δ ] [Δ] ] + [--Δ ] ] >

mô'ābiyyô<sup>t</sup> 'ammōniyyô<sup>t</sup> 'ādōmiyyō<sup>t</sup> šēdniyyō<sup>t</sup> ḥittiyyō<sup>t</sup>  
= [ [ [ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ Δ ] ] >

by 2.21a

< [ [ Δ Δ ] M [ √Δ ] M [ [ [ Δ Δ ] [Δ] ] + [--Δ ] ] >  
= [ [ [ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ Δ ] ] >

by 2.21b

< [ [ Δ Δ ] M [ √Δ ] M [ [ [ Δ Δ ] [Δ] ] + [--Δ ] ] >  
Z [ [ [ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ Δ ] ] >

by 2.21a (second time)

< [ [ Δ Δ ] M [ √Δ ] M [ [ Δ Δ ] [Δ] ] + [--Δ ] >  
Z [ [ [ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ Δ ] ] >

by 2.21b (second time)

< [ [ Δ Δ ] M [ √Δ ] M [ [ Δ Δ ] [Δ] ] Z [--Δ ] >  
Z [ [ [ Δ Δ ] + [ Δ Δ ] ] + [ Δ Δ Δ Δ ] ] >

Rules 2.21a/b operate, of course, when the direct object immediately following the verb consists of one or

more clauses (i.e., when the verb is a verb of stating, knowing, etc). For example:

Num.23.16 (...and he said: "Return to Balak and speak thus.")

wayyōmer                                    'el  
     šûb bālāq wēkōh tēdabbēr  
 ( [ /v\ ] M [ [ /v\ -/\ ] + [ /\ /v\ ] ] )

(The above represents a stage of derivation, after all phrasing rules have operated on the subordinate clauses.)

by 2.21a/b

( [ /v\ ] M [ /v\ -/\ ] Z [ /\ /v\ ] )

Ex.10.16 (and he said, "I have sinned against the LORD your god and against you.")

wayyōmer                    ḥāṭā'tî    laYHWH 'ēlōhēm wēlakem  
 ( ( /v\ ) M ( ( ( /v\ ) M ( [ /\ = /\ ] + [ /\ ] ) ) ) )

by 2.12a, 2.17 within subordinate clause

( ( /v\ ) M ( ( [ /v\ ] M [ [ /\ /\ ] + [ /\ ] ] ) ) )

by 2.21a/b within subordinate clause

( ( /v\ ) M ( ( [ /v\ ] M [ /\ /\ ] Z [ /\ ] ) ) )

by 2.28a/b within subordinate clause  
 (see below for these rules)

( ( /v\ ) M ( [ [ /v\ ] [ /\ /\ ] ] Z [ /\ ] ] ) )

by 2.17

( [ /v\ ] M [ [ /v\ ] [ /\ /\ ] ] Z [ /\ ] ] )

by 2.21a/b

< [ [ \v\ ] H [ [ \v\ ] [ \^ \^ ] ] Z [ \^ ] ] >

Note in this example that 2.21a/b determines the ultimate accentual grouping and accounts for what might otherwise seem incongruous:

[wayyōmer]  
[ḥāṭā'tî laYHWH ălōhêkem]  
[wélākem]

[and he said]  
[I have sinned against the LORD your god]  
[and against you]

**2.22a If the first external member that follows the verb is central and divisible, and if the principal bond of the second external member is + = @ or Z ,**

**delete the brackets that enclose the second member.**

The principal bond of a member can be Z if the member includes a subordinate clause (to which, of course, the cyclical phrasing rules have already applied).

Rule 2.22a applies, for example, to the second post-verbal member of Ex.3.22a ("And each woman shall borrow from her neighbor and from the lodger in her house...")



wəṣā'ālāh 'iṣṣāh miṣṣēkentāh ūmiggārat bēṭāh  
 ( [ /v\ ] M [ \ ] M [ [ \ ] + [ \ \ ] ] M... )

becomes by 2.22a

( [ /v\ ] M [ \ ] M [ \ ] + [ \ \ ] M... )

Rule 2.22a can detach the antecedent of a non-restrictive clause, as in Gen. 2.22 ("And the LORD God fashioned the rib, which he had taken from the man, into a woman"):

wayyiber YHWH 'ēlōhîm 'et haṣṣēla' lāqaḥ hā'ādām lē'iṣṣāh  
 ( [ /v\ ] M [ \ \ ] M [ [-\ ] = [-/v\ -\ ] ] M [ \ ] )

becomes

( [ /v\ ] M [ \ \ ] M [-\ ] = [-/v\ -\ ] M [ \ ] )

Note that the first line of this derivation presupposes that the phrasing rules have already operated on the relative clause.

Rule 2.22a cannot, however, detach the antecedent of a restrictive relative clause. For example, it has no effect on Ex. 4.30a ("And Aaron spoke all the words which the LORD had spoken to Moses"):

waydabbēr 'ahārōn 'et kol haddebārîm 'āšer dibber YHWH 'el mōšeh  
 ( [ /v\ ] M [ \ ] M [ [--\ ] ≡ [ [-/v\ ] [ \ ] [-\ ] ] )

Like rule 2.21a, rule 2.22a can also operate on a direct object that consists of one or more clauses. See Gen. 1.9 in appendix C for an example.

**2.22b Change exposed + or = to Z if no intra- or inter-member bond other than Z or + follows within the clause; change any remaining exposed intra-member bond**

either to M or to MM , to conform with the inter-member bond that immediately precedes.

The effect of 2.22b on the examples immediately above is as follows:

Ex.3.22 --

< [ /v\ ] M [ /\ ] M [ /\ ] + [ /\ /\ ] M...

becomes

< [ /v\ ] M [ /\ ] M [ /\ ] M [ /\ /\ ] M...

Gen.2.22 --

< [ /v\ ] M [ /\ /\ ] M [-/\ ] = [-/v\ -/\ ] M [ /\ ] >

becomes

< [ /v\ ] M [ /\ /\ ] M [-/\ ] M [-/v\ -/\ ] M [ /\ ] >

As already discussed above with respect to relative clauses, the flattening effect of 2.22a is more limited than that of 2.21a: the first of these rules affects members that contain any bond (other than & , on which there is one condition); the second affects only members whose principal bond is non-restrictive coordinate. The intonational significance of the difference between the two rules is neatly demonstrated in the final clauses of three verses from Leviticus 14: Lev.14.40 ("and they shall throw them outside the city into an unclean place"); Lev.14.41 ("and they shall pour the plaster that they scrape off outside the city into an unclean place"); Lev.14.45 ("and

he shall carry them outside the city into an unclear place").

The phrase 'el miḥûṣ lā'îr 'el māqôm ṭāmē' is here translated (following the word order of the Hebrew) as "outside the city into an unclear place". The RSV, however, translates the phrase, less literally but with greater conveyance of sense, as "to an unclear place outside the city". The RSV translation makes clear in English what is quite clear in the Hebrew: that the two prepositional phrases constitute one compound adverbial rather than two simple ones. (See section 1.24 for discussion of compound adverbials.)

Phrasing rules operate on these three clauses as follows:

Lev. 14.40 --

wěhišlikû 'ethen miḥûṣ lā'îr māqôm ṭāmē'  
 < [ /v\ ] m [ \ ] M [ [-\ \ ] @ [-\ \ ] ] >

becomes by 2.21a/b

< [ /v\ ] m [ \ ] M [-\ \ ] M [-\ \ ] >

Lev. 14.41 --

wěšāpkû he'āpār hiqsû miḥûṣ lā'îr māqôm ṭāmē'  
 < [ /v\ ] M [-\ -/v\ ] M [ [-\ \ ] @ [-\ \ ] ] >

This representation presupposes that a complete cycle of phrasing rules has already operated on the embedded relative clause. Neither 2.21a nor 2.22a applies: 2.21a does not apply because the first post-verbal member is indivisible; 2.22a does not apply because the principal bond of the second post-verbal member is not non-restrictive coordinate.

Lev. 14.45 --

wehōšî' 'el miḥûš lā'îr 'el māqôm tāmē'  
< [ /v\ ] M [ -/\ \ ] @ [ -/\ \ ] ] >

becomes by 2.21a/b

< [ /v\ ] M [ -/\ \ ] M [ -/\ \ ] ] >

The ultimate accentual phrasing of these three clauses can be represented in translation as:

Lev. 14.40 [and they shall throw them]  
[outside the city]  
[into an unclear place]

Lev. 14.41 [and they shall pour]  
[the plaster that they scrape off]  
[[outside the city][into an unclear place]]

Lev. 14.45 [and he shall carry (them) ]  
[outside the city]  
[into an unclear place]

The fact that the grouping of the prepositional phrases in Lev. 14.41 is different from that in the other two verses is clearly not due to any difference in meaning (i.e., to any difference in underlying syntactic relationships). Flattering (defined as the operation of rule 2.21a) occurs in Lev. 14.40 and Lev. 14.45, but not in Lev. 14.41, and that accounts for the difference.

The limited flattering effect of 2.22a (as compared with 2.21a) is well demonstrated also in the treatment of the second post-verbal member of Ex. 34.23 ("Three times in the year shall all your males appear before the sovereign LORD, the God of Israel."):

šālōš pē'āmîm baššārîāh  
 < [ [ [ Δ Δ ] [ Δ ] MM

yērā'eh kol zékûrêkâ 'et pērê hâ'ādōr: YHWH 'ēlōhê yiśrā'ēl  
 [ Δ Δ ] M [-Δ ] M [ [ [-Δ ] [ Δ Δ ] ] ] = [ Δ Δ ] ] >

For a step-by-step derivation of the intra-member phrasing of the relevant member, see appendix B.

The second post-verbal member of this verse is not affected by a flattening rule because its principal bond is restrictive. But in Ex.3.1a ("And Moses was keeping the flock of Jethro, his father-in-law, the priest of Midian"), there is a member which has exactly the same structure and which is affected by a flattening rule:

úmošeh hāyāh rō'eh 'et šō'n yitrô hōtērô kōhēn midyān  
 < [ [ Δ ] M [-Δ Δ ] M [ [ [-Δ ] [ Δ Δ ] ] ] = [ Δ Δ ] ] >

becomes by 2.21a/b

< [ [ Δ ] M [-Δ Δ ] M [ [-Δ ] [ Δ Δ ] ] ] Z [ Δ Δ ] >

The difference, of course, is that in Ex.24.23 the member with that structure is the second post-verbal member and its restrictive principal bond cannot be breached. In Ex.3.1, the member in question is the first post-verbal member and is therefore susceptible to flattening even with a restrictive principal bond.

Rules 2.22a/b, like 2.21a/b, may apply twice in the same clause, as in Gen.27.15a ("And Rebecca took garments of Esau her older son, the best ones, that were with her in the house"):

'et                      bēnāh              haḥā- 'āšer  
wattiqqah ribqāh bigdê 'esāw haggādōl mudōt 'ittāh babbāyit  
< [ /v ] M [ ] M [ [ [- ] ] [ ] ] = [ ] ] = [ - ] ] >

by 2.22a

< [ /v ] M [ ] M [ [ [- ] ] [ ] ] = [ ] ] = [ - ] ] >

by 2.22b

< [ /v ] M [ ] M [ [ [- ] ] [ ] ] = [ ] ] Z [ - ] ] >

by 2.22a (second time)

< [ /v ] M [ ] M [ [ [- ] ] [ ] ] = [ ] ] Z [ - ] ] >

by 2.22b (second time)

< [ /v ] M [ ] M [ [ [- ] ] [ ] ] Z [ ] ] Z [ - ] ] >

Rules 2.22a/b also apply twice to a clause in  
Gen. 29.10 ("When Jacob saw Rachel, the daughter of Laban  
his mother's brother, and the sheep of Laban his mother's  
brother"):

ka'āšer  
rā'āh              ya'āqōb              'et rāḥēl              bat lābān 'āhî 'immō  
< [ - /v ] ] M [ ] ] M [ [ [- ] ] ] = [ [ [- ] ] [ ] ] ] ] >

wē'et šō'n lābān 'āhî 'immō  
+ [ [ [- ] ] ] [ [ ] ] ] ] >

by 2.22a

< [ - /v ] ] M [ ] ] M [ [ [- ] ] ] = [ [ [- ] ] [ ] ] ] ] ]  
+ [ [ [- ] ] ] [ [ ] ] ] ] >

by 2.22b

< [ - /v ] ] M [ ] ] M [ [ [- ] ] ] = [ [ [- ] ] [ ] ] ] ] ]  
Z [ [ [- ] ] ] [ [ ] ] ] ] >

by 2.22a (second time)

< [-\underline{v}] M [ \underline{\Delta} ] M [-\underline{\Delta} ] = [ [-\underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ]  
Z [ [-\underline{\Delta} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] >

by 2.22b (second time)

< [-\underline{v}] M [ \underline{\Delta} ] M [-\underline{\Delta} ] Z [ [-\underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ]  
Z [ [-\underline{\Delta} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] >

See appendix A for the step-by-step derivation of the intra-member phrasing of the relevant members of Gen.27.15 and 29.10.

For the breaching of @@ on the second application of rule 2.22a, see the derivation of Gen.1.12 in appendix C. (This rule does not, however, affect @, as was demonstrated in the examples above from Leviticus 14.)

Rules 2.21a and 2.22a are "effective" phrasing rules in the sense that they change the bracketing of the syntactic analysis (parsing) that was the basis and point of departure for the process of deriving accentual groupings. (It is worth noting that they effect no change beyond the second post-verbal external member.)

Rules 2.21b and 2.22b are "helper" rules in the sense that they do not change bracketing but rather re-label junctures between brackets so that later effective rules (2.26a and 2.26b) can be easily and clearly stated. Rules 2.23a through 2.23d, which now follow, are helper rules like 2.21b and 2.22b. They make further assignments of the symbol Z, thereby categorizing certain members as not belonging to the nucleus of their clause. Rules 2.26a and

2.26b, which establish the relation of pre-verbal members to clausal nuclei, presuppose the operation of these helper rules and prove their utility.

**2.23a Change post-verbal M or MM to Z if no M follows and if any post-verbal MM bond precedes.**

The phenomenon of one post-verbal marginal member preceded by another occurs frequently, as in the last clause of Gen.31.25 ("...and Laban pitched with his kinsmen in the hill country of Gilead."):

wēlābān tāqa' 'et 'eḥāw bēhar haggil'ād  
 < [ △△ ] M [ √△ ] MM [-△△ ] MM [ △△ △△ ] >

becomes

< [ △△ ] M [ √△ ] MM [-△△ ] Z [ △△ △△ ] >

Similarly, in the last clause of II Sa.3.38 ("...that a prince and a great man fell today in Israel?"):

kî šar wēgādól nāpal hayyôm hazzeh bēyisrā'ēl  
 < [-△△ △△ ] M [ √△△ ] MM [ △△ △△ ] MM [ △△ ] >

becomes

< [-△△ △△ ] M [ √△△ ] MM [ △△ △△ ] Z [ △△ ] >

Much less often encountered is a central member preceded by a marginal member, as in Num.15.13 ("Every citizen shall do in this way these things..."):



kol hā'ezrāḥ ya'āseh kākāh 'et 'ēlīeh  
 < [-ʔ] ] M [ ʔv ] MM [ ʔ ] M [-ʔ] ] >

becomes

< [-ʔ] ] M [ ʔv ] MM [ ʔ ] Z [-ʔ] ] >

**2.23b Change post-verbal M or MM to Z if no m follows and if two or more post-verbal occurrences of M precede.**

Some examples of the application of this rule are the following:

Gen. 19.24 ("And the LORD rained on Sodom and Gomorrah  
 brimstone and fire from the LORD out of  
 heaven."):

wəYHWH himṭîr sēdōm 'āmōrāh goprît wā'ēs YHWH haššāmāyim  
 'al wə'al mē'ēt min  
 < [ʔ] M [ʔv] M [-ʔ & -ʔ] M [ʔ & ʔ] MM [-ʔ -ʔ] >

becomes by 2.21a/b

< [ʔ] M [ʔv] M [-ʔ] M [-ʔ] M [ʔ & ʔ] MM [-ʔ -ʔ] >

which then, by 2.23b, becomes

< [ʔ] M [ʔv] M [-ʔ] M [-ʔ] Z [ʔ & ʔ] Z [-ʔ -ʔ] >

Ex. 40.12 ("And you shall bring Aaron and his sons to the  
 door of the tent of meeting"):

'et wə'et  
 wəhiqrabtā 'ahārōn bānāw 'el petah 'ōhel mō'ēd  
 < [ ʔv ] M [-ʔ & -ʔ] MM [ [-ʔ] ] [ ʔ ʔ ] ] >

becomes by 2.21a/b

< [ ʔv ] M [-ʔ] M [-ʔ] MM [ [-ʔ] ] [ ʔ ʔ ] ] >

which then, by 2.23b, becomes

< [ [ /v\ ] M [ -/\ ] M [ -/\ ] Z [ [ -/\ ] [ /\ /\ ] ] ] >

Lev.27.34 ("...that the LORD commanded Moses for the Israelites on Mount Sinai.") --

'āser siwwāh YHWH 'et mōseh 'el bērē yisrā'ēl bēhar sīnāy  
< [ -/\v\ ] M [ /\ ] M [ -/\ ] MM [ -/\ /\ ] MM [ /\ /\ ] >

becomes by 2.23b

< [ -/\v\ ] M [ /\ ] M [ -/\ ] Z [ -/\ /\ ] Z [ /\ /\ ] >

Deut.33.1 ("...with which Moses, the man of God, blessed the Israelites before his death.") --

'āser bērak mōseh 'is hā'elōhīm 'et bērē yisrā'ēl lipnē mōtō  
< [ -/\v\ ] M [ [ /\ ] = [ /\ /\ ] ] M [ /\ /\ ] MM [ /\ /\ ] >

becomes by 2.21a/b

< [ -/\v\ ] M [ /\ ] M [ /\ /\ ] M [ /\ /\ ] MM [ /\ /\ ] >

becomes by 2.23b

< [ -/\v\ ] M [ /\ ] M [ /\ /\ ] Z [ /\ /\ ] Z [ /\ /\ ] >

An internal member preceded by an external member is not frequently found. The possibility of this sequence must be explicitly excluded from these rules, however, for such a sequence blocks the rules when it occurs, as in Esther 1.5 ("...the king gave for all the people present in Susa the capital, both great and small, a banquet..."):

lēmiggādōl  
lēkol hannim- bēsūšan wē'ad  
'āsāh hammelek hā'ām šē'im habbīrah qāṭan mīsteh  
< [ /v\ ] M [ /\ ] M [ [ [ -/\ ] [ /v\ ] [ /\ /\ ] ] = [ /\ -/\ ] ] m [ /\ ] >

becomes by 2.22a/b

< [ /v ] M [ ] M [ [ - ] [ /v ] [ ] ] M [ [ ] - ] m [ ] >

See appendix B for the full derivation of the phrasing of this clause.

The third post-verbal M of this clause is not changed to Z, because an internal member follows.

The accentual importance of this non-change will become clearer in the discussion that follows rule 2.26a.

**2.23c Change post-verbal M to Z if it is preceded by at least one other post-verbal external bond, and if the member which follows it contains /v\ or any intra-member bond.**

This rule applies, for example, to Gen.1.1 ("At the start of God's creating the heavens and the earth"):

bērē'šît                      bārā' 'ēlōhîm                      haššamāyîm                      hā'āreš  
 < [ ] \* [ < [ /v ] M [ ] M [ ] & [ ] ] >

becomes by 2.23c (operating on the embedded clause)

< [ ] \* [ < [ /v ] M [ ] Z [ ] & [ ] ] >

The rule also applies to Lev.14.41b ("and they shall pour the plaster that they scrape off outside the city into an unclean place"):

wēsāpkû                      he'āpār                      hiqšû                      miḥûš                      lā'îr                      māqôm                      ṭāmē'  
 < [ /v ] M [ - ] [ - /v ] M [ [ - ] ] @ [ - ] ] >

becomes

< [ /v\ ] M [ -\ \ ] Z [ [ -\ \ ] \ ] @ [ -\ \ ] \ ] ] >

See Gen. 1.12 in appendix C for an example of the operation of rule 2.23c when a following member contains /v\ .

**2.23d Change post-verbal MM to Z if it is preceded by at least one other post-verbal external bond, and if the member which follows it contains two or more words.**

This rule applies, for example, to Deut. 32.44 ("And Moses came and spoke all the words of this song in the ears of the people, he and Joshua son of Nun."):

'et

wayyābō' mōšeh waydabbēr kol dibrê hassīrah hazzō't  
 < [ /v\ ] M [ \ ] > < [ /v\ ] M [ [ --\ ] [ \ \ ] ]  
 bē'oznê hā'ām hū' wēhōšēa' bin nūn  
 MM [ \ \ ] MM [ [ \ ] + [ \ -\ ] ] >

becomes by 2.23a

< [ /v\ ] M [ \ ] > < [ /v\ ] M [ [ --\ ] [ \ \ ] ]  
 MM [ \ \ ] Z [ [ \ ] + [ \ -\ ] ] >

which then, by 2.23d, becomes

< [ /v\ ] M [ \ ] > < [ /v\ ] M [ [ --\ ] [ \ \ ] ]  
 Z [ \ \ ] Z [ [ \ ] + [ \ -\ ] ] >

**2.24 Delete all intra-member bonds.**

Intra-member bonds play no further role in the determination of phrasing. The rules that follow will refer only to members and inter-member bonds.

**2.25a** If, within its own clause, a verb is preceded by an internal member, bracket the verb with

- 1) an immediately following internal member, or
- 2) an immediately following central member, or
- 3) an immediately following sequence of internal member and central member (in that order).

Rules 2.25a through 2.26b can be understood as, so to speak, "adjudications" of claims to intonational closeness with the verb that are put forth by members that precede and follow the verb. Rule 2.25a establishes, in particular, that a pre-verb internal member is surpassed in intonational closeness with its verb only by the kinds of members listed (above) in the rule.

Here are some examples of how rule 2.25a applies:

Gen. 21.6 ("God has made laughter for me"):

šəḥōq      'āsāh      lî      'ēlōhîm  
 < [ Δ ] m [ Δv ] m [ Δ ] M [ Δ ] >

becomes

< [ Δ ] m [ [ Δv ] ] m [ Δ ] M [ Δ ] ] >

Gen. 37.4 ("...that their father loved him more than all his brothers")

kî 'ōtô      'āhab      'ābihem      mikkol 'eḥāw  
 < [-Δ ] m [ Δv ] M [ Δ ]      MM [-Δ ] >

becomes

< [-Δ ] m [ [ Δv ] ] M [ Δ ] ] MM [-Δ ] >

Deut.18.18 ("A prophet will I raise for them from among their brethren, like you")

nābî'      'āqîm      lāhem      miqqereb      kāmôkā  
 'āhêhem  
 < [ ^ ] m [ ^ ] m [ ^ ] MM [ ^ ^ ] MM [ ^ ] >

becomes

< [ ^ ] m [ ^ ] m [ ^ ] MM [ ^ ^ ] MM [ ^ ] >

See also Deut.19.2 in Appendix B.

**2.25b If verb-initial clause A is immediately preceded, with no braces intervening, by another clause B that consists only of a verb,**

**delete the elbows of clause B, bring B within the elbows of clause A, and, treating B like an internal member, proceed as in 2.25a.**

Rules 2.25b and 2.26b describe one of the most remarkable features of Biblical accentual grouping: the incorporation of one apparently independent clause into another. Rule 2.25b concerns incorporated clauses that consist only of a verb and that are treated like internal members. Rule 2.26b will deal with longer incorporated clauses that are treated like external members.

The following are examples of the workings of 2.25b:

Gen.27.42 ("And she sent and called Jacob, her younger son")

wattišlah wattiqrā' lēya'āqōb bēnāh haqqātān  
 < [ /v\ ] > < [ /v\ ] M [ [ \ ] ] = [ [ \ ] \ ] ] >

by 2.21a/b

< [ /v\ ] > < [ /v\ ] M [ [ \ ] ] Z [ [ \ ] \ ] >

by 2.25b

< [ /v\ ] "M" [ [ /v\ ] M [ [ \ ] ] ] Z [ [ \ ] \ ] >

Gen.45.13 ("and you shall hurry and bring my father down here")

ûmihartem wêhōradtem 'et 'ābî hērnāh  
 < [ /v\ ] > < [ /v\ ] M [-\ ] MM [ [ \ ] ] >

by 2.25b

< [ /v\ ] "M" [ [ /v\ ] M [-\ ] ] MM [ [ \ ] ] >

Ex.2.7 ("shall I go and call you a nurse from the Hebrew women")

ha'ēlēk wēqārā'tî lāk 'iśšāh min  
 mēneqet hā'ibriyyot  
 < [ /v\ ] > < [ /v\ ] m [ [ \ ] ] M [ [ \ ] \ ] MM [ [ \ ] ] >

by 2.25b

< [ /v\ ] "M" [ [ /v\ ] m [ [ \ ] ] M [ [ \ ] \ ] ] MM [ [ \ ] ] >

The clause-sequences affected by rule 2.25b include, but are not limited to, what has been called "verbal hendiadys" (see Lambdin, section 173). Thus, in the examples above, Gen.45.13 contains an instance of verbal hendiadys (the first verb "serves to qualify the second and is best translated adverbially in English"), but Ex.2.7 is probably not such an instance.

**2.26a If, within its own clause, a verb is preceded by an external member,**

bracket what follows that external member, up to but excluding the first occurrence of Z or of a right-hand elbow.

The following are examples of the workings of 2.26a:

Gen. 10.15 ("And Canaan begat Sidon his first-born and Heth."):

ûkěna'an yālad 'et šîdôn běkôrô wě'et hēt  
 ( [ Δ ] M [ √ ] M [ [ Δ Δ ] + [ Δ ] ] )

by 2.21a/b

( [ Δ ] M [ √ ] M [ Δ Δ ] Z [ Δ ] )

by 2.26b

( [ Δ ] M [ [ √ ] M [ Δ Δ ] ] Z [ Δ ] )

Gen. 18.18 ("And Abraham will surely become a great and mighty nation")

wě'abrāhām hāyô yihyeh lěgôy gādôl wě'āšûm  
 ( [ Δ ] M [ -√ ] M [ [ Δ Δ ] & [ Δ ] ] )

by 2.21a/b

( [ Δ ] M [ -√ ] M [ Δ Δ ] M [ Δ ] )

by 2.26a

( [ Δ ] M [ [ -√ ] M [ Δ Δ ] M [ Δ ] ] )

Gen. 19.24 ("And the LORD rained upon Sodom and Gomorrah brimstone and fire from the LORD out of heaven.")

'al wě'al mē'ēt min  
 wəYHWH himṭîr sêdôm 'āmōrāh goprît wā'ēs YHWH haššāmāyim  
 ( [ Δ ] M [ [ √ ] ] M [ -Δ & -Δ ] M [ Δ & Δ ] MM [ -Δ -Δ ] )

by 2.21a/b, 2.23b, 2.24

( [ Δ ] M [ [ √ ] ] M [ -Δ ] M [ -Δ ] Z [ Δ Δ ] Z [ -Δ -Δ ] )



by 2.26a

< [△] M [ [△v△] M [-△] ] M [-△] ] Z [△ △] Z [-△ -△] >

Ex.3.1 ("And Moses was keeping the flock of Jethro, his father-in-law, the priest of Midian"):

ûmōseh hāyah rō'eh 'et šō'n yitrô hātēnô kōhēn midyān  
< [ △ ] M [-△v△] M [ [ [-△] ] [ △ △ ] ] = [ △ △ ] >

by 2.21a/b

< [ △ ] M [-△v△] M [ [-△] ] [ △ △ ] ] Z [ △ △ ] >

by 2.26a

< [ △ ] M [ [-△v△] ] M [ [-△] ] [ △ △ ] ] ] Z [ △ △ ] >

I Ki.11.1("King Solomon loved many foreign women in addition to Pharaoh's daughter -- Moabite, Ammonite and Edomite women, Sidonian and Hittite women."):

wēham- rišim wē'et  
melek šelōmōh 'āhab nokriyyōt rabbōt bat par'ōh  
< [ △ △ ] M [ △v△ ] M [ [ [ △ △ ] [△] ] + [-△△] ] ]  
mō'ābiyyōt 'ammōniyyōt 'ādōmiyyōt šēdniyyōt ḥittiyyōt  
= [ [ [ △ △ ] + [ △ ] ] + [ △ △ ] ] ] >

by 2.21a/b (twice)

< [ △ △ ] M [ △v△ ] M [ [ △ △ ] [△] ] Z [--△ ]  
Z [ [ [ △ △ ] [ △ ] ] [ △ △ ] ] >

by 2.26a

< [ △ △ ] M [ [ △v△ ] M [ [ △ △ ] [△] ] ] Z [--△ ]  
Z [ [ [ △ △ ] [ △ ] ] [ △ △ ] ] >

Esther 1.5 ("And at the completion of those days, the king gave for all the people present in Susa the capital, both great and small, a banquet, for seven days..."):

ubimlô't hayyāmîm hā'ēlleh  
 ( [ [ Δ ] [ Δ ] Δ ] MM

lēmiggādôl  
 lēkol hannim- bēsûsan we'ad  
 'āsāh hammelek hā'am sē'im habbîrāh qāṭār mîsteh  
 [ΔV] M [Δ] M [[[-Δ]][[ΔV]] [Δ Δ]]]=[Δ -Δ] m [Δ]

sib'at yāmîm...  
 [ Δ Δ ] ...)

by 2.22a/b, 2.23b

( [ [ Δ ] [ Δ Δ ] MM

[ΔV] M [Δ] M [[[-Δ]][[ΔV]] [Δ Δ]] M [Δ -Δ] m [Δ]

Z [ Δ Δ ]...)

2.26a

( [ [ Δ ] [ Δ Δ ] MM

[ [ΔV] M [Δ] M [[[-Δ]][[ΔV]] [Δ Δ]] M [Δ -Δ] m [Δ] ]

Z [ Δ Δ ]...)

**2.26b If a clause (A) that starts with a verb and contains a Z is immediately preceded, with no braces intervening, by a verb-initial clause (B) that contains more than just a verb but no Z, change B's elbows to brackets, bring B within A's elbows, and, treating B like an external member, proceed as in 2.26a.**

**Repeat.**

The following examples illustrate the workings of 2.26b:

Gen.32.23 ("And he arose that night and took his two wives and his two maids and his eleven children")

wayyāqom ballaylāh hū'  
 < [ /v ] MM [ / / ] >  
 'et wē'et wē'et  
 wayyiqqah šte nāsaw šte šiphōtaw 'ahad 'āsār yēlādaw  
 < [ /v ] M [ [ - / / ] + [ - / / ] + [ -- / / ] ] >

by 2.21a/b

< [ /v ] MM [ / / ] >  
 < [ /v ] M [ - / / ] M [ - / / ] Z [ -- / / ] >

by 2.26b

< [ [ /v ] MM [ / / ] ] "M"  
 [ [ /v ] M [ - / / ] M [ - / / ] ] Z [ -- / / ] >

Ex. 3.20 ("And I will stretch out my hand and smite Egypt with all the wonders which I will do in its midst")

'et 'et bēkōl 'āser 'e'ēseh  
 wēšālahtī yādī wēhikkētī miṣrayim niplē'ōtay beqirbō  
 < [ /v ] M [ - / / ] > < [ /v ] M [ - / / ] MM [ [ - / / ] = [ - /v / / ] ] >

by 2.23d, 2.24

< [ /v ] M [ - / / ] > < [ /v ] M [ - / / ] Z [ [ - / / ] [ - /v / / ] ] >

by 2.26b

< [ [ /v ] M [ - / / ] ] "M" [ [ /v ] M [ - / / ] ]  
 Z [ [ - / / ] [ - /v / / ] ] >

Num. 19.2 ("speak to the Israelites and they will bring you a red heifer without blemish, in which there is no defect and on which no yoke has come.")

'el pārah  
 dabbēr bēnē yisrā'el wēyiqhū 'elēkā 'adummāh tēmimāh  
 < [ /v ] M [ - / / / ] > < [ /v ] m [ / / ] M [ [ / / / ] [ / / ] ] >

'āser 'āser  
 'āser 'en bāh mūm lō' 'ālāh 'ālēhā 'ōl  
 = [ [ - /v / / ] [ / / ] ] = [ [ -- /v / / ] [ / / ] ] >

by 2.21a/b

< [ /v\ ] M [-\ \ ] > < [ /v\ ] m [ \ ] M [ [ \ \ ] [ \ ] ]  
M [ [-/v\ \ ] [ \ ] ] Z [ [--/v\ \ ] [ \ ] ] ] >

by 2.26b

< [ [ /v\ ] M [-\ \ ] ] "M" [ [ /v\ ] m [ \ ] M [ [ \ \ ] [ \ ] ]  
M [ [-/v\ \ ] [ \ ] ] ] Z [ [--/v\ \ ] [ \ ] ] ] >

"Speak to the Israelites and they will bring..." is a falsely literal translation that is convenient for illustrating rule 2.26b. "Tell the Israelites to bring..." would more accurately reflect Biblical Hebrew usage.

The following is an example of the repeated application of rule 2.26b:

Ex.24.4 ("And Moses wrote all the words of the LORD, and he rose early in the morning and built an altar under the mountain and twelve pillars for the twelve tribes of Israel.")

'ēt kol  
wayyiktōb mōšeh dibrē YHWH wayyaškēm babbōqer  
< [ /v\ ] M [ \ ] M [--\ \ ] \ ] > < [ /v\ ] MM [ \ ] >  
wayyiben mizbēah taḥat hāhār ūštēm lišnēm šibtē  
< [ /v\ ] M [ [ [ \ ] @ [ \ \ ] ] + [ [-\ \ ] @ [ [-\ \ ] [ \ \ ] ] ] ] >

by 2.21a/b (twice), 2.23a, 2.24

< [ /v\ ] M [ \ ] M [--\ \ ] > < [ /v\ ] MM [ \ ] >  
< [ /v\ ] M [ \ ] M [ \ \ ] Z [ [-\ \ ] [ [-\ \ ] [ \ \ ] ] ] >

by 2.26b (first time)

< [ /v ] M [ ] M [ -- ] > < [ [ /v ] MM [ ] ] "M"  
[ [ /v ] M [ ] M [ ] ] Z [ [ - ] [ [ - ] [ ] ] ] >

by 2.26b (second time)

< [ [ /v ] M [ ] M [ -- ] ] "M" [ [ [ /v ] MM [ ] ] "M"  
[ [ /v ] M [ ] M [ ] ] ] Z [ [ - ] [ [ - ] [ ] ] ] >

The adjudications of rules 2.25a and 2.26a (building on the categories of member-verb relations given in parsing as well as on the definition of Z provided in previous phrasing rules) help rationalize what might otherwise seem arbitrary differences in accentual grouping. Why, for example, are the last two clauses of Gen.31.25 grouped differently from one another?

[and Jacob]  
[ pitched his tent in the hill country ] ]

[and Laban]  
[pitched with his kinsmen]  
[in the hill country of Gilead]

Application of the rules shows why:

wēya'āqōb tāqa' 'et 'chōlō bāhār  
< [ ] M [ /v ] M [ - ] MM [ ] >

wēlābār tāqa' 'et 'eḥāw bēhar haggil'ād  
< [ ] M [ /v ] MM [ - ] MM [ ] >

by 2.23a

< [ / ] M [ / ] M [ - ] MM [ / ] >

< [ / ] M [ / ] MM [ - ] Z [ / ] >

rules 2.23b through 2.23d do not apply

by 2.26a

< [ / ] M [ [ / ] M [ - ] MM [ / ] ] >

< [ / ] M [ [ / ] MM [ - ] ] Z [ / ] >

Why, for another example, are the first clause of  
Gen. 37.3 and the second clause of Gen. 37.4 grouped  
differently from one another?

[And Israel]  
[loved Joseph more than all his sons]

[that him]  
[their father loved]  
[more than all his brothers]

Again, adjudication rules account for the difference:

wěyisrā'ēl 'āhab 'et yôsēp mikkol bānāw  
< [ / ] M [ / ] M [ - ] MM [ - ] >

by 2.26a

< [ / ] M [ [ / ] M [ - ] MM [ - ] ] >

kî 'ōtô 'āhab 'ābihem mikkol 'ehāw  
< [ - ] m [ / ] M [ / ] MM [ - ] >

by 2.25a

< [-△ ] m [ [ △v△ ] M [ △ ] ] MM [-△ ] >

**2.27 Pair a verb 1) with an immediately following one-word non-marginal member, or, if there is no such member, 2) with an immediately preceding one-word non-marginal member, or, if there is no such member, 3) with an immediately following one-word marginal member.**

Examples of the operation of this rule are very common:

Gen. 1.1 ("At the start of God's creating the heavens and the earth")

bērē'šît                      bārā' 'ēlōhîm                      'ēt                      wē'ēt  
hasšāmayim hā'āreṣ .  
( [ △ ] \* [ < [ △v△ ] M [ △ ] Z [-△ ] & [-△ ] > )

becomes

( [ △ ] \* [ < [ △v△ ] △ ] Z [-△ ] & [-△ ] > )

Gen. 1.2 ("And the earth was formless and void")

wēhā'āreṣ    hāyētāh    tōhû                      wābōhû  
( [ △ ] M [ △v△ ] M [ △ ] M [ △ ] )                      (after 2.21a/b)

becomes

< [ [ Δ ] M [ /v\ Δ ] M [ Δ ] >

Gen. 3.10 ("your voice I heard in the garden")

'et qōlĕkā ŷāma'tî baggān  
 < [-Δ ] m [ /v\ ] MM [ Δ ] >

becomes

< [-Δ /v\ ] MM [ Δ ] >

Ex. 24.4 ("And Moses wrote all the words of the LORD, and he rose early in the morning and built an altar under the mountain, and twelve pillars for the twelve tribes of Israel.")

'ēt kol  
 wayyiktōb mōšeh dibrē YHWH wayyašĕm babbōqer  
 < [ [ /v\ ] M [ Δ ] M [ --Δ Δ ] ] "M" [ [ [ /v\ ] MM Δ ] ] "M"  
 wayyiben mizbēah taḥat ḡstēm lišnēm šibtē  
 hāhār 'eērēh maššēbāh 'āsār yisrā'ēl  
 [ [ /v\ ] M [ Δ ] M [ Δ Δ ] ] Z [ [-Δ Δ ] [ [-Δ ] [ Δ Δ ] ] ] >

becomes

< [ [ /v\ Δ ] M [ --Δ Δ ] ] "M" [ [ [ /v\ Δ ] ] "M"  
 [ [ /v\ Δ ] M [ Δ Δ ] ] Z [ [-Δ Δ ] [ [-Δ ] [ Δ Δ ] ] ] >

**2.28a If an embedded clause contains one or more occurrences of Z, bracket together everything which precedes the first Z.**

**2.28b Within an embedded clause, delete all inter-member bonds except Z.**



**2.28c Change the elbows of an embedded clause to brackets.**

Rules 2.28a/b/c apply when the phrasing rules are operating on an embedded clause (i.e., when the phrasing rules are operating within elbows that are enclosed by parentheses), as, for example, in Lev.27.34 ("These are the commandments which the LORD commanded Moses for the Israelites on Mount Sinai."):

'ēlleh                    'āser                    'et  
hammiṣwōt                ṣiwwāh                YHWH                mōšeh  
< ( [-△] ] ≡ [ < [-/v△] ] M [ △ ] M [-△] ] MM  
'eṭ  
bērē yisrā'ēl behar sināy  
[-△ △ ]    MM [ △ △ ] > ] ) >

by 2.23a/b, 2.27

< ( [-△] ] ≡ [ < [-/v△ △] ] M [-△] ] Z  
[-△ △] Z [ △ △ ] > ] ) >

by 2.28a

< ( [-△] ] ≡ [ [ [-/v△ △] ] M [-△] ] ] Z  
[-△ △] Z [ △ △ ] > ] ) >

by 2.28b

< ( [-△] ] ≡ [ [ [-/v△ △] ] [-△] ] ] Z  
[-△ △] Z [ △ △ ] > ] ) >

by 2.28c

< ( [-△] ] ≡ [ [ [-/v△ △] ] [-△] ] ] Z  
[-△ △] Z [ △ △ ] ] ) >

See appendix B for the rest of the derivation of the accentual grouping of this verse and for an understanding of the role of rules 2.28a/b/c in that derivation.

After rules 2.28a/b/c have operated on an embedded clause, the cycle of phrasing rules begins again, this time on the clause in which the first clause was embedded.

Rules 2.29a/b do not apply to an embedded clause. They apply only to independent clauses. The operation of 2.29a/b signals that the cycle of phrasing rules is finished and that the countdown rules must come into operation next.

**2.29a Delete all inter-member bonds ( Z not excepted).**

**2.29b Change all elbows and braces to brackets.**

After the operation of 2.27, rules 2.29a and 2.29b apply to Ex.24.4 ("And Moses wrote all the words of the LORD, and he rose early in the morning and built an altar under the mountain and twelve pillars for the twelve tribes of Israel") as follows:

		'et kol				
wayyiktob	moseh	dibrê	YHWH	wayyaškem	babböqer	
< [ [ / \ ] ]	[ \ ]	[ -- \ ]	[ \ ] ]	"M"	[ [ / \ ] ]	"M"
		taḥat	üstêm	lišnem	šibtê	
wayyiben	mizbēaḥ	hāhār	'esrēh	maššēbāh	'āsār	yisrā'ēl
[ [ / \ ] ]	[ \ ]	M [ \ ] [ \ ] ]	] Z [ [ - \ ] [ \ ] ]	[ [ - \ ] ]	[ [ \ ] [ \ ] ] ] ]	>

becomes

[ [ [ / \ ] ] [ \ ] ]	[ -- \ ] [ \ ] ]	[ [ / \ ] ] [ \ ] ]
[ [ / \ ] ] [ \ ]	M [ \ ] [ \ ] ] ]	[ [ - \ ] [ \ ] ] [ [ - \ ] ] [ [ \ ] [ \ ] ] ] ] ]

See any verse in appendices B, C and D for further examples of the operation of these rules.

These rules clear the way for the countdown operation which follows. Almost all syntactic categories ("clause", "member", "inter-member bond", etc.) have been effaced. (The one exception is that verbs are still marked.) The countdown rules will operate on a very simple and abstract bracketing of words.

### 3. COUNTDOWN RULES (Cadencing Part 1)

3.0 In chapter II, section 6, the idea of a countdown of disjunctions was set forth at some length, and the operation of countdown rules was illustrated with a fair number of examples. Here, the rules are simply re-stated, for the sake of completeness in presenting the procedure by which the accents are derived.

It is assumed that all the bracket-pairs which emerge from the phrasing rules have a disjunctive function: each pair disjoins the words that it encloses from other words in the verse. Bracket-pairs that enclose two or more words also have a conjunctive function: they conjoin those enclosed words with each other.

**3.1a Mark the end of the last immediate phrasing constituent (IPC) as d̸.**

In other words, put d̸ (= "final disjunction") at the end of the verse. d̸ marks the disjunction of the words of the verse from those of the following verse.

After 3.1a has operated, any brackets which enclose the whole verse may be deleted.

**3.1b Mark the end of the next-to-last IPC as d̸.**

Rule 3.1b divides the verse for two countdowns of disjunctions. These primary countdown divisions (or units) may, for convenience, be called "hemistichs" or "half-verses".

Brackets which enclose a hemistich and which are not immediately adjacent to word-symbols may be deleted.

Rules 3.1a and 3.1b apply to Ex.24.4 as follows:

wayyiktōb	wayyaškēm
[ [ [ /v \ ] [ -- Δ Δ ] ]	[ [ /v \ ] Δ Δ ]
wayyiben	
[ [ /v \ Δ Δ ] M [ Δ Δ ] ] ]	[ [ - Δ Δ ] [ [ - Δ Δ ] [ Δ Δ ] ] ] ]

becomes

[ [ /v \ Δ Δ ] [ -- Δ Δ ] ]	
[ [ /v \ Δ Δ ] [ [ /v \ Δ Δ ] M [ Δ Δ ] ] ]	d̸
[ - Δ Δ ] [ [ - Δ Δ ] [ Δ Δ ] ]	d̸

See pp.70-74 for further explanation and illustration of the "first countdown rule", which is equivalent to rules 3.1a and 3.1b.

It is understood from pp.74-78 that the terms "hemistich" and "half-verse" do not imply equality in length or syntactic/semantic weight.

Rule 3.1b operates as stated for the vast majority of verses. It is blocked under certain conditions, however, chiefly when the last IPC is very short or when the whole verse is very short. A typical example is Ex.1.13 ("And the Egyptians worked the Israelites harshly") --

'et

wayya'ābidû mišrayim bēnē yiśrā'ēl bēpārek  
 [ [ √ ] ] [ -∆ ∆ ] [ ∆ ] ]

-- where the last IPC consists of one short word.

A careful study of exceptions to 3.1b needs to be done within the context of the grammar of the accents. I have not done this yet, however, and, for the present, I can add nothing systematic to the sketch of these exceptions that Wickes provides (see Wickes, pp.61-64).

**3.2a Proceeding from right to left in each hemistich (primary countdown unit), label its IPCs in numerical sequence, so that, for any IPC labelled "d(x)", the IPC immediately to the left is labelled "d(x+1)".**

Rule 3.2a divides each hemistich into secondary countdown units. After its operation, and after each subsequent operation of a countdown rule, those brackets may be deleted which enclose the units just defined and which are not adjacent to any word-symbol.

Rule 3.2a applies to Ex.24.4 as follows:

$$\begin{array}{l} [ [\swarrow \searrow \ \ \ ] \ [ \text{--} \ \ \ ] \ ] \\ [ [\swarrow \searrow \ \ \ ] \ [ [\swarrow \searrow \ \ \ ] \ M \ [ \ \ \ ] \ ] \ ] \\ [ \text{--} \ \ \ ] \ [ [ \text{--} \ \ \ ] \ [ \ \ \ ] \ ] \end{array} \begin{array}{l} \\ \\ d0 \\ d0 \end{array}$$

becomes

$$\begin{array}{l} [\swarrow \searrow \ \ \ ] \ [ \text{--} \ \ \ ] \\ [\swarrow \searrow \ \ \ ] \ [ [\swarrow \searrow \ \ \ ] \ M \ [ \ \ \ ] \ ] \\ [ \text{--} \ \ \ ] \ [ [ \text{--} \ \ \ ] \ [ \ \ \ ] \ ] \end{array} \begin{array}{l} \\ \\ d1 \\ d0 \\ d1 \\ d0 \end{array}$$

**3.2b** Proceeding from right to left in each secondary countdown unit, label its IPCs in numerical sequence (as in 3.2a). Rule 3.2a divides each secondary countdown unit into tertiary countdown units.

Rule 3.2b applies to Ex.24.4 as follows:

$$\begin{array}{l} [\swarrow \searrow \ \ \ ] \ [ \text{--} \ \ \ ] \\ [\swarrow \searrow \ \ \ ] \ [ [\swarrow \searrow \ \ \ ] \ M \ [ \ \ \ ] \ ] \\ [ \text{--} \ \ \ ] \ [ [ \text{--} \ \ \ ] \ [ \ \ \ ] \ ] \end{array} \begin{array}{l} \\ \\ d1 \\ d0 \\ d1 \\ d0 \end{array}$$

becomes

$$\begin{array}{l} [\swarrow \searrow \ \ \ ] \ [ \text{--} \ \ \ ] \\ [\swarrow \searrow \ \ \ ] \ [ [\swarrow \searrow \ \ \ ] \ M \ [ \ \ \ ] \ ] \\ [ \text{--} \ \ \ ] \ [ [ \text{--} \ \ \ ] \ [ \ \ \ ] \ ] \end{array} \begin{array}{l} \\ \\ d2 \\ d1 \\ d1 \\ d1 \\ d0 \\ d1 \\ d1 \\ d0 \end{array}$$

**3.2c** Repeat 3.2b as often as necessary, substituting "tertiary" for "secondary", then "quaternary" for "tertiary", and so forth.

Of course, 3.2a, 3.2b and 3.2c are in effect one and the same cyclical rule. (They have been stated separately to avoid extreme abstractness in defining countdown units.)

Rule 3.2c applies to Ex.24.4 as follows:

$$\begin{array}{l}
 \left[ \begin{array}{c} \diagdown \diagup \\ d2 \end{array} \right] \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \\
 \left[ \begin{array}{c} \diagdown \diagup \\ d1 \end{array} \right] \left[ \left[ \begin{array}{c} \diagdown \diagup \\ d1 \end{array} \right] M \left[ \begin{array}{c} \diagdown \diagup \\ d0 \end{array} \right] \right] \\
 \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \left[ \begin{array}{c} \diagdown \diagup \\ d0 \end{array} \right]
 \end{array}$$

becomes

$$\begin{array}{l}
 \left[ \begin{array}{c} \diagdown \diagup \\ d2 \end{array} \right] \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \\
 \left[ \begin{array}{c} \diagdown \diagup \\ d1 \end{array} \right] \left[ \left[ \begin{array}{c} \diagdown \diagup \\ d1 \end{array} \right] M \left[ \begin{array}{c} \diagdown \diagup \\ d0 \end{array} \right] \right] \\
 \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \left[ \begin{array}{c} \text{--} \diagdown \diagup \\ d1 \end{array} \right] \left[ \begin{array}{c} \diagdown \diagup \\ d0 \end{array} \right]
 \end{array}$$

See pp.78-84 for explanation and illustration of the "second countdown rule", which is equivalent to rules 3.2a-c.

#### 4. PACING RULES (Cadencing Part II)

4.0 Pacing rules slow the pace of recitation at the end of a countdown or when the countdown is "racing" (bracketing too many words together). Pacing rules speed up the pace of recitation at the beginning of a countdown or when the countdown is "stuttering" (repeating the same number on three successive words). The slowing is accomplished through "expansion", which is increase in the rate of

disjunction; the speeding-up is accomplished through "compression", which is decrease in the rate of disjunction.

A bracketing labelled with the disjunction  $d(x)$  is at the end of a countdown if the number of the disjunction that follows is greater than or equal to  $x$ . Conversely, a bracketing labelled with the disjunction  $d(x)$  is at the beginning of a countdown if the number of the preceding disjunction is smaller than or equal to  $x$ .

The first disjunction  $d(x)$  of a hemistich is always at the beginning of a countdown because the number of the preceding disjunction must be 0 or  $\emptyset$ , either of which is necessarily smaller than or equal to  $x$ .

A sequence such as ... $d_1$   $d_1$   $d_1$   $d_0$ ... (for an example, see the discussion following rule 4.3b below) may seem hard to define in terms of beginnings and ends of countdowns. The first of these disjunctions ends a countdown; it may also be the beginning of a countdown if it is preceded by another  $d_1$  or by  $d_0$  or  $d\emptyset$ . The second disjunction begins and ends a countdown. The third disjunction begins but does not end a countdown. The fourth disjunction ends but does not begin a countdown. I offer this paragraph of definitions for completeness' sake in demonstrating that every disjunction can be defined with respect to the beginnings and ends of countdowns. As a practical matter, however, the rules that are conditioned by beginnings and ends of countdowns do not operate on sequences such as the one in question here.

The number and length of the words at a given countdown position may block the operation of a pacing rule. If the words grouped at the end of a countdown are



too few or too short, the group will not be expanded by the insertion of a disjunction. If the words grouped at the beginning of a countdown are too many or too long, two groups will not be compressed by the removal of a disjunction.

Countdown position -- the general enabling condition of the pacing rules -- can be defined quite simply and exactly, as above. Statement of the specific inhibiting conditions of number and length must remain, at least for now, somewhat more complex and approximate. This lack of simplicity and exactness may correspond to the irreducible facts of the situation: there may be a good deal of free variation in this part of the grammar of the accents. Or it may be that some generalizations about length and number have so far been missed. Further study is needed on this point, but the general shape and effects of the pacing rules can, nevertheless, be usefully described.

The rules that follow are for the most part illustrated by examples in Appendix C (Gen.1-13) and Appendix D (Ex.1-16).

The following definitions apply for these rules:

- 1) A word is long if it contains four or more syllables.
- 2) A word is short if it contains three or fewer syllables.

- 3) The syllables of a word-group are many if they total seven or more.
- 4) The syllables of a word-group are few if they total five or less.

#### **4.1 Restore non-phraseable words (except -q).**

Pacing rules, unlike phrasing rules, are sensitive to the number and length of the words in the verse. They operate on all the words of the verse, not just on the phraseable ones. "Word" will henceforth be understood as including non-phraseable words.

#### **4.2 Expand a bracketed word-group at the end of a countdown.**

If the word-group consists of only one word, the rule is blocked.

If the group contains more than one word, the rule operates if any word is long and/or if the total syllables are not few. If both of these conditions are lacking, the rule is blocked.

Exceptions:

- 1) If the group contains more than one word and it comprises an entire hemistich, the rule is blocked only if the total syllables are few. See Ex. 40.9, 13, 16.
- 2) If the group consists of [ /\-△△ △△ ], the rule is blocked if all words are short and total syllables

are fewer than six; it may also be blocked if the syllables total six. See Gen.1.2.

Of course, in a study of Biblical Hebrew, the use of the term "syllable" without explanation or definition begs questions to which whole volumes have been devoted, but there is no room in this study for discussion of such questions. For present practical purposes, a syllable is as defined in Lambdin, sections 2 and 5. It may be, however, that closer study of the conditions that block pacing rules will also require closer study of syllables.

The patterns of expansion at the end of a countdown are as follows:

[ △△ △△ ]	becomes	[ △△ ] [ △△ ]	Ex. 40.11,13,15
[ ^△ △△ △△ ]	"	[ ^△ ] [ △△ △△ ]	Gen.1.7, Ex.40.3,6
[ △△ ^△ △△ ]	"	[ △△ ] [ ^△ △△ ]	Ex.4(4 times), 7,10
[ ^△ △△ ^△ △△ ]	"	[ ^△ △△ ] [ ^△ △△ ]	Gen.1.1,4 Ex.40.15

In Gen.1.6, there is an exception to the second of these patterns. See the end of section 5 for discussion of this and other exceptions.

If rule 4.2 did not operate from right to left, it would not achieve the correct results. The reason is that the expansion of a bracketing on the right puts a bracketing on the left at the end of a countdown. Thus, for example, in Ex.40.13 ("And you will put upon Aaron the holy garments"):



the second unit is labelled *d1* and if the syllables of each unit are few.

This rule operates, for example, on Gen.45.14a ("And he fell on the neck of his brother Benjamin, and he wept..."):

wayyippōl 'al šawwē'rê binyāmin 'āḥîw wayyēbk  
 ( ( /v\ ) M ( [-\ ] \* [ \ ] = [ \ ] ) ) ( ( /v\ ) )

becomes, by 2.12a, 2.13b, 2.17, 2.29a, 2.29b, 3.2a, 4.1

[ /v\ ] [ \ ] [ \ ] [ /v\ ]  
           d2           d2           d1           d0

which then, by 4.3a, becomes

[ /v\ ] [ \ ] [ \ ] [ /v\ ]  
           d2           d1           d0

For other examples of the operation of this rule, see p.98-100; Gen.1.5(bis,10,11,13 in appendix C; and Ex.40.15 in appendix D.

See Gen.1.9 and Ex.5,9,10 for examples of this rule's being blocked.

**4.3b If three successive countdown units are labelled with the same degree of disjunction, and if each consists of only one word, then compress the third of these units with the unit which follows.**

Rule 4.3b has been placed with rule 4.3a because both involve compression. Although stated in general terms, and without reference to underlying syntax, rule 4.3b has a narrow and syntactically specific application: it applies to lengthy construct chains. Thus, in Ex.40.6 ("before the door of the tabernacle of the tent of meeting"):

lipné     petah     miškan     'ōhei mō'ēd  
 [ Δ Δ ]   [ Δ Δ ]   [ Δ Δ ]   [ Δ Δ Δ Δ ]  
                d1                         d1                         d1                         d∅

becomes

[ Δ Δ ]   [ Δ Δ ]   [ Δ Δ Δ Δ ]  
                d1                         d∅

**4.4 If a bracketed word-group has many syllables and consists of four or more words, expand it by disjoining the first word.**

This rule applies, for example, to Ex.40.16

("according to all that the LORD commanded him, so he did"):

kēkol 'āšer šiwwāh YHWH 'ōtō     kēn 'āsāh  
 [ \     \     Δ Δ     Δ Δ ] [ Δ Δ ]     [ Δ Δ Δ Δ ]  
    d2                         d1                         d∅

becomes

[ \ ] [ \ Δ Δ Δ Δ ] [ Δ Δ ]     [ Δ Δ Δ Δ ]  
                d3                         d2                         d1                         d∅

This rule is blocked in Ex.40.9 because the syllables are not many.

Even though this rule involves expansion, it is not placed with rule 4.2 because it applies without respect to countdown position. Moreover, if it were to precede 4.3a, then 4.3a would have to be stated in such a way as to exclude the effects of 4.4.

**4.5 Detach q.**

## 5. Hyphenation rules (Cadencing part III)

5.0 The pacing rules, operating on the output of the phrasing and countdown rules, make the final determination of which words are to be accented disjunctively. The hyphenation rules then determine, for every word which is not to be accented disjunctively (i.e., for any word which is not the last word of a bracketed group), whether it will be accented conjunctively or will depend for its stress and intonation upon another word.

Thus, the hyphenation rules are a subdivision of the pacing rules: they, too, affect the rate of utterance. They have been separately named and numbered for the sake of convenience. Convenience is also the reason for their not being called "rules of proclisis and enclisis", although that name better describes what they are. "Hyphenation" here refers specifically to the insertion of *maqep*, the hyphen-like grapheme which the Masoretes used to represent proclisis and enclisis.

The hyphenation rules operate in two ways: 1) they attach monosyllabic words to other words; 2) they group words together within brackets that contain three or more words. The details of the operation of these rules differ according to the disjunctive degree ( $d_0$ ,  $d_1$ ,  $d_2$ ) of a given word-group.

N.B. For the purposes of the hyphenation rules, the term "monosyllable" excludes words with more than one vowel except in one case: if the first syllable of a two-syllable word A consists of waw and schwa, and if word B, which follows, consists of two syllables or less, then word A counts as a monosyllable.

It will be evident from the rules that the rate of hyphenation is slowest at the beginning of a countdown and fastest at the end. The organization of word-groups is looser at the beginning of a countdown: two and even three words, each with its own conjunctive accent, can precede a word that is accented with a d2 or a d3. Towards the end of a countdown, the organization is much tighter: only one conjunctively accented word can be part of the group which precedes a d1, d0 or d∅; all other words must be hyphenated.

The rules that follow are illustrated by examples in Appendix C (Gen.1-13) and Appendix D (Ex.1-16).

**5.1a Within brackets labelled d0 or d∅ :**

**hyphenate a monosyllabic / \ to any following word;**

**hyphenate a monosyllabic / \ to any preceding word that is not short.**

Note that the second case includes wayhî kēn (Gen.1.7) and yĕhî 'ôr (Gen.1.3) but excludes yôm 'eḥād (Gen.1.5) and kēn 'āsāh (Ex.40.16) because no word



precedes the monosyllable. Also excluded is wĕkihĕrî lî̂ (Ex.40.13) because the preceding word is short.

**5.1b Within brackets labelled d1 :**

**hyphenate as in 5.1a if there are more than two words in the bracketed group;**

**if there are only two words, hyphenate monosyllabic /\ if the d1 does not begin a countdown**

If the d1 begins a countdown, monosyllabic /\ is sometimes hyphenated, sometimes not. Further study is needed to establish whether this is free variation or whether some other factors need to be taken into account.

Note that in Gen.1.4, 'et-hā'ôr̂, which does not begin a countdown, is hyphenated, but bĕrî hā'ôr̂, which does begin a countdown, is not hyphenated.

**5.1c Within brackets labelled d2 or d3 :**

**hyphenate as in 5.1a, but only if there are more than two words in the bracketed group.**

**5.2a Within brackets labelled d0 , dØ , or d1 ,**

**hyphenate words on the same side of the symbol ! .**

After this hyphenation, the symbol ! may be deleted.

This rule operates on word-groups that result from the compression of rule 4.3. Thus, for example, after the

operation of rule 5.1b, which inserts a hyphen after the non-phraseable 'al, rule 5.2a operates on Gen.45.14 ("And he fell on the neck of his brother Benjamin, and he wept..."):

wayyippōl 'al ṣawwe'rê binyāmin 'āḥîw wayyēbk  
 [ √ ] [ / - ] [ √ ] [ √ ] [ √ ]  
 d2 d1 d0

becomes, by 5.2a

[ √ ] [ / - ] [ √ - ] [ √ ]  
 d2 d1 d0

Also on Gen.1.5 ("and it was evening and it was morning"):

wayhî 'ereb wayhî bōqer  
 [ √ ] [ √ ] [ √ ] [ √ ] becomes [ √ - ] [ √ - ]

And on Ex.40.6 ("the tabernacle of the tent of meeting"):

petah 'ōhel mō'ēd  
 [ √ ] [ √ ] [ √ ] becomes [ √ ] [ √ - ]

**5.2b Within brackets labelled d2 or d3, there is no pairing by hyphenation unless there are more than three words in the bracketed group.**

The further a word-group is from the end of a countdown, the looser and more freely varied its organization. Other than the general statement of 5.2b, there will be no attempt in this study to establish the hyphenation patterns within the higher-numbered disjunctive groups.

Wickes (p.100) and others following him have, in effect, observed that, if a disjunctive d3 precedes d2 by only a few words or syllables, then that d3 is "transformed" into a conjunctive of d2 (see rule 4.3a above for the equivalent of this observation). But no one has noticed that a "transformation" (i.e., compression) also occurs when d2 precedes d1 under similar conditions. I think the compression before d1 has not been noticed because it involves not just the replacement of a disjunctive by a conjunctive accent, but also the replacement of a conjunctive accent by a hyphen. This phenomenon escapes notice because it is generally (and incorrectly) assumed that hyphenation cannot be derived from syntax by a set of rules, that, in other words, it is a given (like the division of the text into words and verses).

Some apparently free variations and some exceptions to the rules of sections 4 and 5 may turn out to be quite regular if certain minimal grammatical information -- the location of "governing" words -- is retained in the bracketing upon which the cadencing rules operate. "Governing" words would be verbs and nouns in construct state.

Rule 5.1a could be re-stated, for instance, to stipulate that when two ∧-words are grouped together at the end of a countdown, they are hyphenated if the word on

the left governs the one on the right. This would explain the difference (already noted above) between the hyphenation in wayhî-kĕn (Gen.1.7) and the lack of it in ken 'asah (Ex.40.16). It would also explain the difference between the lack of hyphenation in yôm 'ehād (Gen.1.5) and its presence, for example, in dam-zibhî "the blood of my sacrifice" (Ex.34.25).

The location of a governing word could be used to explain an exception to rule 4.2 that was noted above. When, at the end of a countdown, disjunction is inserted in the group [ /\ Δ Δ ], the two Δ-words are generally kept together, as in ['ĕt] ['ārôn hā'ēdūt] (Ex.40.3), but they may be separated in such instances as [bĕn mayîm] [lāmāyîm] (Gen.1.6) or ['et ḥawwāh] ['ištō] "Eve, his wife" (Gen.4.1). Keeping two Δ-words together may be described as obligatory when the first is a governing word. (In the two "exceptional" examples, the second word is loosely subordinate or in apposition to the first.)

The location of a governing word may also explain apparent free variation in the operation of rule 5.1b. When a group consisting of [ /\ Δ ] is labelled d1 and begins a countdown that is not the first of the verse, monosyllabic /\ is sometimes not hyphenated, as in bĕn hā'ōr (Gen.1.4), but, when it is hyphenated, as in Ex.40.2 and Ex.40.12, the word to which it is hyphenated is a governing word, specifically the first word in a construct chain.

Probably, therefore, the bracketing of words upon which the cadencing rules operate is not wholly purified of grammatical information: it needs to retain marking of the location of governing words. Actually, the rules as presently formulated do retain the distinguishing mark of the verb, which appears as  $\underline{\vee}$  rather than as  $\Delta$ . After the deletion, in the intra-member phrasing rules, of the symbol  $*$ , which marks the bond between a word in construct state and the word or words which it governs, the noun in construct state could be distinguished as a governing word by the symbol  $\Delta_$ , distinct from  $\Delta$ .

## 6. Accentuation

6.0 The accentuation rules convert the bracketing that emerges from the cadencing rules into actual accentual sequences. They are not so much rules as conversion tables. They provide no information that is not generally available in other expositions of the Biblical accents. Their presence here is for the sake of completeness as well as to demonstrate that my newly-formulated rules for deriving accentual grouping systematically from syntax dovetail neatly into well-known rules for assigning specific accents.

Since hyphenation (the placement of maqep ) has already been determined in section 5, the accentuation rules are concerned only with words which will be accented. For the purposes of the accentuation rules, therefore, / \- \ \ , for example, is one word, as is / \- / \- / \- \ \ .

For the purposes of the accentuation rules, the difference between d4 and d3 is eliminated. This neutralization may be an instance of a general tendency in intonational phrasing: the greater the distance from the end of an intonational phrase, the fewer and weaker the obligatory distinctions and the more free variation is allowable. In the rules for deriving Masoretic accentuation, this tendency can be seen also in the fact that expansion does not occur in word-groups that are far from the end of a countdown (see the pacing rules above) and in the fact that hyphenation is much less stringently applied in word-groups that are far from the end of a countdown (see the hyphenation rules above).

6.110 In the countdown of a verse, more than one occurrence of disjunctive  $d(x)$  may precede the first occurrence of  $d(x-1)$  . Occurrences of  $d(x)$  may thus be distinguished from each other by the immediacy of their relation to the next occurrence of  $d(x-1)$  .

6.111 The occurrence of  $d1$  that immediately precedes  $d0$  or  $d\emptyset$  is marked "d1." .

When two or more d1-disjunctives occur before the next occurrence of d0 or d0 , the d1 that is most remote from the next d0/d0 is optionally marked "d1:."

All other occurrences of d1 are marked "d1:" .

6.112 The occurrence of d2 that immediately precedes d1. is marked "d2./." .

The occurrence of d2 that immediately precedes d1: is marked "d2./:" .

The occurrence of d2 that immediately precedes d1:. is marked "d2./:." .

When two or more d2-disjunctives occur before the next occurrence of a d1-disjunctive, the d2 that is most remote from the next d1 is obligatorily marked "d2::" .

6.113 There are four variants of d3 , which can be marked "d3." "d3:" "d3:." and "d3::" . Of these, d3. can only occur preceding d2:: .

When d3 occurs only once before the next occurrence of d2 , the form it takes may be d3. (only before d2:: ) or d3: or d3:. , although d3: is the most common.

When d3 occurs more than once before the next occurrence of d2 , the occurrences of d3 are differentiated from each other. d3. only occurs when d2:: is the next disjunctive. d3:: only appears as the most remote of a series of occurrences of d3 . Within

those limits, the sequencing of d3: and d3: seems to be free, though d3: is more commonly the one that is nearer to the next -d2 .

6.12 Conjunctives may be referred to by substituting "c" for "d" in the term for any given disjunctive or class of disjunctives. Thus, for example, c0 is the conjunctive that accompanies the final disjunctive of the verse; c2./ is the conjunctive that accompanies the d2 that immediately precedes the last d1 of a hemistich.

If more than one conjunctive accompanies a disjunctive, the one nearest to the disjunctive is its "first" conjunctive, the one preceding is its "second" conjunctive, and so forth.

6.210 Everything that is needed to determine actual accentual sequences has now been specified. Conversion tables for disjunctives and conjunctives follow.

6.211	d0	sôp pāsûq	∞ Δ
	d0	'etnahtā'	Δ
	d1.	ṭiphā'	Δ
	d1:	zāqēp qātôn / zāqēp gādôl	Δ / Δ
	d1:.	sēgôl / šalšēlet	Δ / Δ



	d2./.	těbîr	$\frac{\Delta}{\text{J}}$
	d2./:	paštā' / yětîb	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$
	d2./:.	zarqā'	$\frac{\Delta}{\text{J}}$
	d2::	rēbîa'	$\frac{\Delta}{\text{J}}$
	d3.	lĕgarmĕh	$\frac{\Delta}{\text{J}}$
	d3:	geres̄/geršayîm	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$
	d3:.	tĕlîsā' gĕdôlāh	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$
	d3::	pāzēr	$\frac{\Delta}{\text{J}}$
6.212	c0	mĕrĕkā'	$\frac{\Delta}{\text{J}}$
	c0	mûnāh	$\frac{\Delta}{\text{J}}$
	c1.	mĕrĕkā'	$\frac{\Delta}{\text{J}}$
	c1:	mûnāh	$\frac{\Delta}{\text{J}}$
	c1:.	mûnāh	$\frac{\Delta}{\text{J}}$
first	c2./.	mĕrĕkā' / dangā'	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$
first	c2./:	māpak / mĕrĕkā'	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$
first	c2./:	mûnāh	$\frac{\Delta}{\text{J}}$
second	c2./.	qadmā'	$\frac{\Delta}{\text{J}}$
	:		
	::		
third	c2./.	tĕlîsā' qĕtānāh	$\frac{\Delta}{\text{J}}$
	:		
	::		
fourth	c2./.	mûnāh	$\frac{\Delta}{\text{J}}$
	:		
	::		
only	c3.	mûnāh	$\frac{\Delta}{\text{J}}$
first	c3:	qadmā' / mûnāh	$\frac{\Delta}{\text{J}} / \frac{\Delta}{\text{J}}$

second c3:            tēlīśā' qeṭānāh



third c3:            mūnāh



∴  
∴

Where alternatives are given above, the choice depends on the length of the word to be accented, the position of the stressed syllable within the word and/or whether a conjunctive precedes. The rules governing these choices can be found in any handbook of the accents.

#### Chapter IV: CONCLUSION

My aim in this study has been to establish a grammar of Biblical accentuation. I have tried, in other words, to give a systematic account of the relation between the meaning of the Biblical text and the accents that are distributed throughout it. The success of this endeavor can be measured internally: for any given passage, my grammar succeeds insofar as its rules derive the correct accentuation from a reasonable and consistent parsing of the text. Apperidices C and D test my grammar in this internal way and provide a model for further testing.

The success of this grammar can also be measured externally, in two different ways. On the one hand, the grammar can be compared with other treatments of the Masoretic accents: does it give a fuller descriptive account of the relation between meaning and accentuation than others have done? On the other hand, the grammar can be evaluated in the light of general linguistic theory: does it explain the relation between meaning and accentuation in terms that make sense of the Masoretic accents as a linguistic phenomenon? The present chapter is devoted to discussion of the comparative explanatory and descriptive value of my grammar of the Biblical accents. I will focus first on the principle of continuous dichotomy, which dominates discussion of the accents in the work of

other scholars but which my grammar manages to do without. Then, I will have another look at the problem of "syntactic incongruity", focussing this time on what a couple of other linguists have had to say that bears on this subject.

1. The principle of continuous dichotomy

The theory of the continuous dichotomy, as enunciated by Wickes (p.29) and others, makes the claim that disjunctive accents normally divide every Biblical verse, if it is long enough, into two parts; and that each of these parts, if long enough, is in turn divided in two; and so forth, until the parts into which the verse has been divided are not long enough for any further subdivision. Each successive division, as well as the disjunctive accent that marks it, is "weaker" (or "lighter") than the one before.

What makes a verse-part "long enough" for sub-division depends on the particular accentual context. Aronoff,<sup>1</sup> reading Wickes somewhat carelessly perhaps, claims (pp.34-35) that the dichotomy process continues "until no group of more than two words remains undivided." This assertion, aside from the fact that it contradicts Wickes, is easily proven false: one frequently finds sequences of three or even four unhyphenated words that are not divided by any disjunctive accent. (My grammar accounts for such sequences as pre-pausal

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1. Mark Aronoff, "Orthography and Linguistic Theory: The Syntactic Basis of Masoretic Hebrew Punctuation," Language, vol.61, no.1 (1985), 28-72. All mentions of Aronoff in this study refer to this article, as do all page numbers that are inserted in discussion of Aronoff's views.

compression. See the general discussion on pp.196-197 and rule 4.3a on pp.201-202.)

Motivation for this idea of continuous dichotomy is readily found in the parallelismus membrorum that is characteristic of many Biblical verses, especially those that are generally regarded as poetry and translated as such. Deuteronomy 32.2 can serve as an example:

ya'arōp kammātār liqhî	tizzal kattal 'imrāti
kiś'irim 'alê-deše'	wëkirbîbîm 'alê-'ëseb

Drop as the rain, my teaching,  
distil as the dew my speech,  
as the gentle rain upon the tender grass,  
and as the showers upon the herb.

As indicated by the format of the translation (and also by the format of the traditional Hebrew text, mirrored here in the transliteration), the whole of the verse falls into two parts. Although this first division does not correspond to the most important syntactic division of the verse, it does seem to correspond to what, without any particular rigor in definition, we might well call the caesura of the verse, the point at which it balances.

Actually, the phrasing rules of chapter III can, on a purely syntactic basis, account for the apparent lack of syntactic congruity in this first division. The principal break in the verse corresponds to the presence of a Z inserted by rule 2.23b. The first clause is grouped with the nucleus of the second by rule 2.26b.

Each of the two parts of the verse also falls into two parts. And each of those four parts can also be divided further into two parts (though the resources of the poetic

format do not extend to this final sub-division). The second and third divisions correspond, like the first division, to poetic symmetries, and they correspond to syntactic constituent breaks as well. Each one of these divisions can readily be characterized as a dichotomy, i.e., as a division of a whole into two more or less equal parts. Each dichotomy after the first divides the results of a previous dichotomy; in that sense, one might want to view the above verse-analysis as a process of continuous dichotomy.

[ [ [ya`arōp kammāṭār]	[liqḥî ] ]	
[ [tizzal kaṭṭal ]	[`imrātî ] ] ]	
[ [kiś`irim ]	[`alê-deṣe` ] ]	
[ [wēkirbîbîm ]	[`alê-`ēseb] ] ]	
[ [ [Drop as the rain ]	[my teaching ] ]	
[ [distil as the dew ]	[my speech ] ] ]	
[ [ [as the gentle rain]	[upon the tender grass] ]	
[ [and as the showers]	[upon the herb ] ] ]	

Dichotomous verse-structure is by no means limited to poetic passages of the Bible. Ex.40.4, for example, is a quite prosaic verse with a dichotomous structure:

[ [wēhēbē'tā 'et-haššulḥān]	[wē`araktā 'et-`erkô ]
[ [wēhēbē'tā 'et-hammērōrāh]	[wēha`ālētā 'et-nērōtēhā ]
[ [And you shall bring in the table]	
[ [and you shall order its arrangements] ]	
[ [and you shall bring in the lampstand]	
[ [and you shall set up its lamps] ]	

In the above verse-analyses, every divisible constituent has two and only two sub-constituents. When

this is so, the effect of my countdown rules (chapter III, pp.192-196) is wholly equivalent to that of the "law" of continuous dichotomy. For example, given a half-verse (like the first half of Deut.32.2) of the form

[ [ [ ] [ ] ] [ [ ] [ ] ] ]  
d0

the law of continuous dichotomy requires that the half-verse be divided in two and that the division be marked with the strongest disjunctive accent that is weaker than d0. Since there are only two immediate constituents, it is obvious that the break must come between them.

[ [ [ ] [ ] ] [ [ ] [ ] ] ]  
d1 d0

Then, each of the constituents that is marked with a disjunctive accent dx is divided in two and the division is marked with the strongest disjunctive accent that is weaker than dx. Again, since there are only two immediate constituents in each case, the breaks come between them.

[ [ [ ] [ ] ] [ [ ] [ ] ] ]  
d2 d1 d1 d0

Thus, two applications of the continuous dichotomy law (CDL) establish the locations and categories of the disjunctive accents of this half-verse. But two applications of countdown rule 3.2 have the same effect. The only difference between the two accounts of the accent

distribution is in the manner of description. The CDL describes the accents as marking dichotomies within dichotomies. The countdown rule describes the accents as points in a sequence of descending numerical sequences (countdowns).

2...1  
1...0

If the problem were simply to derive the accentuation for this half-verse, there would be no compelling reason to choose one method over the other, though the CDL is perhaps somewhat more appealing since it seems better to reflect the parallelism of the text. But there are, needless to say, many other verses and half-verses whose accentuation must be explained. For most of them, it is not obvious how -- on syntactic, semantic or poetic grounds -- to locate and justify the points of dichotomy that the CDL requires. How have its expounders supposed that the CDL works for the vast majority of verses which do not have the neatly dichotomous structures of the above examples?

With a view to comparing the descriptive and explanatory worth of the CDL theory with my grammar of the accents, I shall examine how the CDL has been supposed to work for two different grammatical situations: for simple verb-initial clauses and for series of independent clauses.

Num.5.23a ("And the priest shall write these curses in



the book") can serve as an example of a simple verb-initial clause:

                          ['et hā'ālōt  
[wĕkātab] hā'ēlleh]       [hakkōhēn]       [bassēper]  
  
[and shall  
write]       [these curses] [the priest] [in the book]

The accentuation of a clause such as this is very simply derived in my grammar of the accents. No phrasing rules are needed, and one application of the countdown rule gives the following result:

[wĕkātab ] ['et hā'ālōt hā'ēlleh] [hakkōhēn] [bassēper]  
          d3                                   d2                                   d1                                   d0

In the context of my countdown rule, the notations d0, d1, d2, d3 stand, of course, for classes of disjunctive accents. The meaning of "d2", for example, is "the class of disjunctive accents that occupy the antepenultimate position in a countdown sequence of disjunctive accents." In the derivation above, the d0 is a given, since the derivation starts with the fact that the clause in question is a half-verse.

I have deliberately chosen an example which requires no phrasing rules because I wish to focus clearly on a comparison of my countdown rule with the prevailing CDL. In the next section, I will compare phrasing rules as a solution to the problem of syntactic incongruity with other attempted solutions.

It is, by the way, a simple matter to choose a clause whose accentual derivation involves no phrasing rules. A verb-initial clause will need no phrasing rules if its members

fulfil three conditions: 1) none contains more than two phraseable words; 2) none contains conjunctive waw (i.e., the equivalent of "and/or"); 3) the member that immediately follows the verb contains two phraseable words. If the third of these conditions is not met, then one phrasing rule will be needed: namely, rule 2.27 (p.188), which groups a verb with an immediately following one-word member.

It is not self-evident that there exists any syntactic, semantic or poetic dichotomy at all in a half-verse like Num.5.23a. Yet the CDL cannot derive the accentuation of such verses unless, as Wickes puts it (p.49), "the last member is first separated by the dichotomy, then the second from the end, and so on till we reach the verb." Within a clause such as Num.5.23a, which contains only four members and a total of five phraseable words, no fewer than three dichotomies must be found! To achieve the correct result, the CDL must be applied three times, as follows:

starting point, with d0 given --

[wəkātab] ['et hā'ālōt hā'ēlleh] [hakkōhēn] [bassēper]  
d0

first application --

[ [wəkātab] ['et hā'ālōt hā'ēlleh] [hakkōhēn] ] [bassēper]  
d1 d0

second application --

[ [ [wəkātab] ['et hā'ālōt hā'ēlleh] ] [hakkōhēn] ] [bassēper]  
d2 d1 d0

third application --

[[ [wəḵātab] [et hā'ālōt hā'ēlleh] ] [hakkōhēn]] [bassēper]  
d3 d2 d1 d0

In the context of the CDL, the notations<sup>2</sup> d0, d1, d2, d3 stand for dichotomies. The meaning of "d2", for example, is "the accentual dichotomy in a sequence of words the last of which is marked d1". It will have been noted that, in my countdown rule, I have used the same notation that is used in the CDL, taking advantage of the fact that "d" can conveniently stand for "disjunctive" as well as for "dichotomy". Confusing though it may at first seem to be, my usage is deliberate. The point is that the dichotomy markings which result from the operation of the CDL, like the disjunctive class markings which result from the operation of the countdown rule, must both then be converted into specific accents, and the conversions are the same for the one as for the other. The CDL and the countdown result in the same accentual sequences. The difference between them lies not in their results, but in how simply the rules operate and in what kind of theory they imply of what Biblical accentuation is.

For neatly dichotomous verses like Deut.32.2 or Ex.40.40, the operation of the CDL and of the countdown are more or less equivalent, but, for Num.5.23a, the CDL is

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2. Miles Cohen seems to be the first to have used this notation, in his The System of Accentuation in the Hebrew Bible (Minneapolis: Milco Press, 1969).

much more cumbersome. Only one application of the countdown rule is needed for this clause and any other like it, whereas three applications of the CDL are needed for this clause (and more would be needed if, say, the clause had one or two more members).

The greater cumbersomeness of the CDL in this case is significant since clauses like Num.5.23a are exceedingly common; one might well be justified in regarding such clauses and verses made up of them as "normal" in the Biblical text. As Wickes says (p.49) of the operation of the CDL on such clauses: "The student may find for himself examples in every page." The sequences of accents that one finds in clauses of this type are also, correspondingly, exceedingly common and seemingly straightforward. What does it say about the CDL theory of the accents that it must derive these sequences so laboriously?

One thing it suggests is that this theory is unconstrained by the facts of speech and its written representation. The CDL theory, as explained by Wickes and everyone else, assumes that the dichotomies which the Biblical disjunctive accents supposedly represent are somehow equivalent to punctuation marks and that they therefore indicate the presence of some sort of pauses. Now utterance of short, simple clauses like Num.5.23a, in Hebrew or English, is likely to take place within one intonational contour. (If it is written in English or

modern Hebrew, it will have a comma or period to end it, but its flow is not likely to be interrupted by any other punctuation mark.) But the Biblical accents, as described by the CDL, put a pause after almost every word!

Furthermore, the CDL assumes that the heaviest and most important dichotomy within clauses like Num.5.23a is always just before the last word, and that the next most important dichotomy is always just before the next-to-last word. How can this assumption be interpreted within a common-sense theory of speech, or within any theory of speech? Are we to understand that Biblical accents call for an utterance with increasingly heavy pauses after each syntactic component of a simple clause? If modern punctuation were adapted to convey this understanding of the effect of Biblical accents, it might look something like this:

wekātab. 'et hā'ālōt hā'ēleh.. hakkōhēn... bassēper....

(Each period stands for a unit of time, so that the pauses get longer as utterance of the verse proceeds.)

I can imagine that such a sequence of pauses might occur in normal human utterance if the speaker's attention were wandering, or if he were falling asleep in the middle of a conversation, or if he were dying and uttering last words. But I cannot imagine that the Masoretes recorded or

prescribed such a mode of utterance for every verb-initial clause in Scripture.

It is not only I who find this notion odd. Wickes himself says (p.30): "It was a peculiar system, but one that must have answered its purpose." It is obvious to him, and to everyone, that the accents, especially the "heaviest" ones, often correspond to punctuation marks as we know them, but very often he, too, finds (pp.29-30) that the effect of the accents (as described by the CDL) is incompatible with his sense of how punctuation marks are normally expected to function: "We naturally ask, what was the purpose designed by the remarkable process of division and minute sub-division? No doubt it served to mark the logical and syntactical interpunction. But...it was not needed to anything like the extent to which it was applied. Some other explanation therefore is necessary."

Wickes does not mean that it is necessary to find an alternative to the CDL as an explanation for how the accents work. He takes the principle of continuous dichotomy as given. If that principle seems a peculiar one for the the Masoretes to have used for the purpose of indicating how the Biblical text is to be uttered, then they must, according to Wickes (p.30), have had another purpose that overrides the problem of incompatibility with normal expectations for speech.

And there can be no question that the object aimed at, was that which is the

essential characteristic of the accentuation, --musical effect. The result of the continuous dichotomy was a succession of pausal melodies (more or fewer) fixed by rule, which...gave the cantillation of the verse.

"It was a peculiar system" (for linguistic utterance, that is) "but one that must have answered its purpose" (which was musical effect). Now it is difficult to imagine how a sequence of short melodies separated by increasingly long pauses could serve as an appropriate musical effect for the cantillation of a simple clause. (Certainly there is no correspondence between Wickes' description and actual present-day liturgical chanting of such clauses.) Wickes makes no attempt to argue for the plausibility of this presumed relationship between the CDL and musical effect; it serves in his exposition only to turn aside his own questions about why the CDL operates so peculiarly. But, since the present study is a linguistic and not a musical one, there is no need for me to try to show conclusively that, with regard to verb-initial simple clauses, the presumed relationship of the CDL to chanting is just as peculiar as its relationship to normal speech. The real point I am making is that, in constructing a theory of the accents, Wickes is not constrained by a more general theory of speech and its written representation. If he were thus constrained, he might have had difficulty maintaining his belief in the CDL.

For the CDL, each disjunctive accent is a dichotomy; each must correspond in some sense to a punctuation mark, i.e., to a pause. This, as we have seen, gives reasonable results for dichotomously structured verses like Deut.32.2 and Ex.40.4: the location of almost all the disjunctive accents in those verses do correspond to where a speaker could or would pause and to where modern punctuation marks would be put. Even for those highly dichotomous verses, however, it is stretching a point to regard the location of all the disjunctives as corresponding to actual or potential pauses. Thus, in Deut.32.2a, it is unlikely that the d2 at *kammatar* and the d1 at *kattal* are pausal in any sense:

ya'arōp	kammātār	liqhî	tizzal	kaṭṭal	'imrāti
	d2	d1		d1	d0

(Drop as the rain my teaching, distil as the dew my speech)

And, of course, when the text is not dichotomously structured, as it is not within a simple verb-initial clause, the CDL, as I have shown and as Wickes acknowledges, gives an understanding of the accents which is peculiar and even absurd.

The countdown rule that I have proposed manages to map the correct accentual sequences onto the text without the absurdities of the CDL. The countdown rule does not require that every disjunctive accent be regarded as pausal, and it provides an easy principle for discerning



which disjunctive accents do and do not fit that description. The countdown rule distinguishes those disjunctives that terminate a countdown sequence from those that do not. It is only the final disjunctives of a countdown sequence that are pausal and correspond to modern punctuation marks. This distinction certainly holds for non-dichotomous texts like Num.5.23a:

	'et hā'alōt		
wēkātab	hā'ēlleh	hakkōhēn	basseper
d3	d2	d1	d0
and shall write	these curses	the priest	in the book

Here only the d0 is at the end of a countdown sequence. And the distinction works equally well for dichotomous texts like Deut.32.2a:

ya'arōp	kammāṭār	liqhî	tizzal	kaṭṭal	'imrāti
	d2	d1		d1	d0

(Drop as the rain my teaching, distil as the dew my speech)

Here the d0 and the first occurrence of d1 are both at the end of countdown sequences, but not the other two disjunctives of the half-verse.

When it is understood that the significant pausal unit is not the individual disjunctive (supposedly dichotomizing) accent but rather the countdown sequence of accents, then Biblical accentuation turns out not to be such a peculiar system after all. The divisions it makes, which are at the ends of those countdown sequences, tend to

be just where we would expect them to be and where modern practice is likely to put punctuation marks.

Why is it that the peculiarities of the intra-clause operation of the CDL --the over-punctuation and the fact that the "heaviness" of the disjunction always increases toward the end of the clause -- do not seem to trouble Wickes? I have already offered one answer to this question: he takes the notion of continuous dichotomy as given, and he is not constrained by a need to justify the accents within the framework of a theory of human utterance.

Another answer is that the intra-clause operation of the CDL is not important to him. He says (p.44) that "the most frequent, although for us the least important, instances of the application of the dichotomy come under this head." Presumably, intra-clause accentuation is less interesting to Wickes because the information it provides about the meaning of the text is most often redundant, in the sense that I have discussed earlier (in chapter II, section 4): the intra-clause word-grouping that the accents indicate is usually apparent from other signs as well (e.g., from morphology and from word-order).

Inter-clause accentuation is much less often redundant. The information it conveys about grouping among clauses is frequently crucial for exegesis, and it also serves to highlight the parallelism that Wickes calls

(p.38) the "main ornament of the Hebrew style." Wickes is more sensitive to the requirements that a theory of inter-clause accentuation ought to satisfy, and he acknowledges (p.31) a "drawback" in the law of continuous dichotomy that he supposes the Masoretes to have adopted:

Two or more equal pauses, in succession, cannot be represented as such. Subordination (variously carried out) necessarily takes place. No doubt the accentuators would have been often glad to mark the equal pauses by accents of equal disjunctive value, if the law which they had laid down for themselves would have permitted it...

What Wickes has in mind, as the examples which he then cites make clear, is a series of clauses within which one would not normally discern any coordinate grouping or any subordination of one clause to another. When this kind of series occurs, Wickes' view of the accentuation as determined by continuous dichotomy requires him to conclude that "subordination" has been imposed despite its absence in underlying structure. Thus, in Ex.19.2a --

[And they journeyed from Rephidim]  
[and they came to the Sinai desert]  
[and they encamped in the desert]

-- the clause-divisions cannot, in Wickes' understanding, be equal. One must be "subordinate" to the other; in other words, one must be a major dichotomy (between the second and third clauses) and the other a minor dichotomy (between

the first and second). This means that, in order for the CDL to operate, the series of clauses must be restructured. Instead of

[ ] [ ] [ ]

the structure must be

[ [ ] [ ] ] [ ]

Two applications of the CDL can then give this result:

```

[ [And they journeyed from Rephidim]
      d2
  [and they came to the Sinai desert] ]
      d1
[and they encamped in the desert]
      d0

```

The effect of the CDL on series of clauses is not peculiar because of too many pauses (as in verb-initial clauses) and not because of pauses in the wrong places. Its "drawback" is rather that it must describe one pause as marking a more important division than another, when nothing syntactic or semantic seems to justify such a differentiation. Here again, as within verb-initial clauses, the countdown method of mapping the accents is simpler and less problematic. One application of the countdown rule to the series of clauses in Ex.19.2 gives, with no restructuring, the following result:

[And they journeyed from Rephidim ]  
d2  
[and they came to the Sinai desert]  
d1  
[and they encamped in the desert ]  
d0

The countdown rules describe the difference between d2 and d1 not as a difference in importance but simply as a difference in position within the countdown sequence.

If Wickes and his successors had not taken the principle of continuous dichotomy as given and if they had felt constrained to explain the accents within a general theory of language and speech, then the CDL's counter-intuitive treatment of series of clauses, which Wickes acknowledges as a drawback, would surely have forced them to question the principle of the CDL itself. The questioning might have been all the more forceful since a survey of the text makes it plain that, whenever the CDL is applied to a series of three clauses in which there is no obvious syntactic or semantic grouping, the "heavier" dichotomy is always between the second and third clauses. In the context of the CDL theory, there is no reason why this should be true, and a striking regularity thereby goes unexplained. By the countdown rule, on the other hand, the "heavier" accent is simply the one which is closer to the end of a countdown sequence; it is ipso facto true that the penultimate member of a series will be marked with an

accent which is more final than that which marks the antepenultimate member of the series.

From the point of view of the countdown rule, the drawback of the CDL with respect to series of clauses can be seen as identical with one of the absurdities of the CDL's treatment of simple verb-initial clauses, namely, the fact that, according to the CDL, the pause after each constituent of such a clause is heavier than the one before. Both of these problems stem from a failure to see that the "heaviness" of a disjunctive accent is a linear and not a hierarchical characteristic. Whether an accent is "heavy" or "light" is a function of its position in a linear sequence of words (and groups of words) to be uttered, not a function of the position in a phrase structure tree of the syntactic break which it marks.

Assuming that the ends of accentual countdown sequences correspond more or less to punctuation marks and thereby to actual or potential pauses, to what can we say that the uninterrupted countdown sequences themselves correspond? If, for example, in the accentuation of Num. 5.23a --

		'et hā'alōt		
wēkātab		hā'ellēh	hakkōhēn	bassēper
d3		d2	d1	d0
and shall write	these curses	the priest	in the book	

-- it is only the d0 that marks a pause, what normal linguistic purpose, if any, do the other disjunctive

accents serve? I suggest that the entire sequence (d3-d2-d1-d0) corresponds to the intonation contour which, in utterance, a pause would normally delimit. Such a contour is a "countdown" in the sense that any point of the contour tends to convey information about how soon the next pause will be heard. This will especially be the case, I believe, when utterance is rhythmic and continuous, as in recitation. Of course, I cannot, in this study, undertake an examination of intonation contours elsewhere than in the recitation of Hebrew Scriptures. My present aim is simply to demonstrate the explanatory value of countdown rules as a description of how the Biblical accents are mapped onto syntax. It is with that aim in view that I am suggesting that accentual countdown sequences may plausibly be viewed as functionally equivalent to the intonation contours of normal human utterance.

This suggestion is closely related to one I made earlier (chapter II, section 6, pp.67-71), about the increasing degrees of finality displayed by the ends of a series of accentual groupings within a verse. Thus, in Deut.32.2a --

ya'ārōp	kammāṭār	liqḥî	tizzal	kaṭṭal	'imrāti
	d2	d1		d1	d0

(Drop as the rain my teaching, distil as the dew my speech)

-- in addition to the short countdowns within each clause, there is also a countdown of the ends of the clauses

themselves. My earlier claim, similar to the present one, was that such a countdown of clauses is equivalent to the use of degrees of finality in general human utterance.

I have shown that the CDL gives cumbersome and counter-intuitive descriptions for simple verb-initial clauses and for series of independent clauses, i.e., for two very common and quite normal grammatical situations, which the countdown rule deals with quite simply, in a way that is compatible with our traditional assumptions about how punctuation works. I have also shown that, even in grammatical situations where the CDL presents no difficulties, there is no reason to prefer it to the countdown rule.

There is, however, one thing I would like to say in defense of "dichotomy" (though not of "continuous dichotomy") as a factor in understanding what Biblical accentuation is. In proposing countdown rather than continuous dichotomy as the mode for mapping accent classes onto syntactic structures, I have had to posit two countdown rules. The second of these is the one that I have been illustrating above. It is neither binary nor dichotomizing; it can assign several disjunctives in a single gesture. But the first countdown rule divides the verse into exactly two parts and no more. Of course, this division is always at the end of the penultimate immediate phrasing constituent (see chapter II, section 6, p.70ff.,



and rules 3.1a-b, p.193); usually, therefore, the two parts are not even roughly equivalent (in meaning or length) and, in that sense, the division is not a dichotomous one. Furthermore, I have been able without difficulty to describe the operation of the first countdown rule in exactly the same way that the second countdown rule is described: it proceeds from right to left, counting immediate constituents. The only difference between the two rules is that the first is finished after it has operated once, whereas the second proceeds until all constituents have been counted.

The fact remains, however, that most verses emerge from the first countdown rule divided into two parts. The second countdown rule then operates on each of those parts, and the result is that these verses contain two sequences of accents that, so to speak, "count down" to zero (the first to d0 and the second to d@ ). Such verses are recited as if, in a narrow and purely formal sense, they were couplets (usually lopsided couplets). Even verses consisting of only one verb-initial clause are often equipped with two countdowns to zero, the second of which begins and ends with the last member of the clause (provided that member is not too short). An example is Ex.40.22 ("And he put the table in the tent of meeting, on the north side of the tabernacle, outside the veil."):

'et	bē'ōhel	yerek	
wayyittēn	hāssulhār	mō'ēd	'al
	d2	d1	d2
and he put	the table	in the tent	on
		of meeting	
			the side of
			the taber-
			nacle
			north-
			wards
miḥūš	lappārōket		
d1	d0		
outside	the veil		

In all, there are three countdown sequences -- three pauses -- in this verse. If there were only one countdown rule governing the distribution of the accents, we would expect all these sequences to find a place within one larger countdown to zero:

d3 d2    d3 d2 d1    d1 d0

Instead, because there are two countdown rules, we find that the first two sequences make one countdown to zero and the third sequence makes a second countdown to zero:

d2 d1    d2 d1 d0 /    d1 d0

The countdown principle is, in my opinion, the neatest description that has been put forward of the mapping of accents onto the syntactic structures of the Biblical text. It is, moreover, an explanation that makes sense of that mapping within a larger theory of intonation and punctuation, since it allows us to regard uninterrupted countdown sequences as functionally equivalent to intonation contours and the ends of countdown sequences as functionally equivalent to pauses (and punctuation marks).

But the countdown theory must describe most verses as containing two countdowns to zero instead of one, and it has no strictly linguistic explanation to offer for this fact. This "couplet effect" has no necessary analog in ordinary utterance; it has to be seen as a feature, not of language, but of literary style, a feature which, superficially, at least, gives even the most prosaic one-clause verse something of the sound of poetic parallelism.

By submitting, in my description of the mapping of Biblical accents onto syntax, to the constraints of linguistic plausibility, I have been able to characterize most aspects of this mapping as linguistically normal and to isolate the one of its features which can not reasonably be called linguistic. Other scholars of the accents, not having been thus constrained, have tended to focus their attention on this non-linguistic feature and, by promoting it to the status of governing principle, have allowed Biblical accentuation to be regarded as an opaque and peculiar system.

## 2. The problem of syntactic incongruity

With respect to the mapping of accents onto syntactic structure, I have pointed out above that Wickes views the peculiarities of the CDL differently according to whether inter-clause or intra-clause divisions are in question.

The grammatical difficulty of the CDL's account of series of clauses is acknowledged as a drawback and an explanation is attempted; but the CDL's grammatically difficult account of divisions within a verb-initial clause is simply stated, as if it required no further comment.

There is a similar difference in attitude with respect to the problem of syntactic incongruity. In the syntactic incongruity of accentual relations among independent clauses, Wickes finds great exegetical interest and demonstration of the artfulness of the Masoretes' use of the accents to express emphasis. A good example is Gen.22.10 ("And Abraham stretched forth his hand and took the knife to slay his son"), which is accented as follows:

wayyišlah	'abrāhām	'et-yādô
	d2	d1
and stretched forth	Abraham	his hand

wayyiqqah	'et-hamma'ākelet
d1	d0
and he took	the knife

lišhōt	'et-bēnô
d1	d0
to slay	his son

Wickes says (p.35) of this verse: "The reader sees at once that the pause comes in just where it is most telling." He means, of course, that, on purely syntactic grounds, one would have expected the principal accentual break to come between the two independent clauses, i.e., on

the last word of the first of these clauses -- yado (his hand). Instead the principal break comes at hamma'akelet (the knife), just before the infinitive phrase that complements the verb wayyiqqah (he took). Wickes assumes that the Masoretes put the break where it is -- in the middle of an independent clause -- for dramatic emphasis. The placement of the break may indeed be dramatically effective, but it can also be regarded as quite regular: it is the inevitable result of the application to this verse of the phrasing rules which I have proposed as operating on all verses, not just on "dramatic" ones.

I have discussed this issue at some length in chapter II (section 5, p.46ff.), but that discussion preceded the exposition of phrasing rules in chapter III (section 2). It may be instructive to see how those rules distribute the accents in at least one verse that has been regarded as an example of irregular and artful Masoretic devising.

wayyišlah 'abrāhām 'et yādô  
 ( ( /v\ ) M ( /\ ) M (-/\ ) )  
 'et  
 wayyiqqah hamma'ākelet lišhōt 'et bērîô  
 ( ( /v\ ) M (-/\ ) MM ( ( /v\ ) M (-/\ ) ) ) )

[2.17, 2.27, 2.28c]

( ( /v\ ) M ( /\ ) M (-/\ ) )  
 ( ( /v\ ) M (-/\ ) MM ( [ /v\ -/\ ] ) ) )

2.17

< [ [  $\angle v \angle$  ] M [  $\angle \angle$  ] M [  $-\angle \angle$  ] >  
 < [ [  $\angle v \angle$  ] M [  $-\angle \angle$  ] MM [  $\angle v \angle - \angle \angle$  ] >

2.23d

< [ [  $\angle v \angle$  ] M [  $\angle \angle$  ] M [  $-\angle \angle$  ] >  
 < [ [  $\angle v \angle$  ] M [  $-\angle \angle$  ] Z [  $\angle v \angle - \angle \angle$  ] >

2.26b

< [ [ [  $\angle v \angle$  ] M [  $\angle \angle$  ] M [  $-\angle \angle$  ] ] "M"  
 [ [  $\angle v \angle$  ] M [  $-\angle \angle$  ] ] Z [  $\angle v \angle - \angle \angle$  ] >

2.27

< [ [ [  $\angle v \angle \angle \angle$  ] M [  $-\angle \angle$  ] ] "M" [  $\angle v \angle - \angle \angle$  ] Z [  $\angle v \angle - \angle \angle$  ] >

2.29a, 2.29b

[ [ [  $\angle v \angle \angle \angle$  ] [  $-\angle \angle$  ] ] [  $\angle v \angle - \angle \angle$  ] [  $\angle v \angle - \angle \angle$  ] ]

3.1a, 3.1b

[ [ [  $\angle v \angle \angle \angle$  ] [  $-\angle \angle$  ] ] [  $\angle v \angle - \angle \angle$  ] [  $\angle v \angle - \angle \angle$  ]  
d0 d0

3.2a, 3.2b

wayyišlah	wayyiqqah 'et	lišhot
'abrahām	'et yādô	'et bērîô
[ $\angle v \angle \angle \angle$ ] [ $-\angle \angle$ ]	[ $\angle v \angle - \angle \angle$ ]	[ $\angle v \angle - \angle \angle$ ]
d2	d1	d0

For scholars of the accents, the inter-clausal syntactic incongruity of verses such as the above, which I am able to see as the regular effect of phrasing rules, has been an interesting anomaly; they have attempted to

explain it as an artful and irregular effect of Masoretic emphasis. Intra-clausal syntactic incongruity has attracted less attention. Scholars of the accents sometimes account for this too as an effect of emphasis, but many types of intra-clausal syntactic incongruity are so ordinary and so constant in their occurrence that attributing them to emphasis, i.e., to something extraordinary, has been patently untenable as an explanation. Syntactic incongruities of this sort, like the CDL's peculiar but exceedingly common mapping of accents onto verb-initial clauses, are usually presented without explanation.

Thus, for example, Wickes simply states (p.49), with no further comment, that "the several parts of a compound member are constantly treated by the accentuation as separate members..." He means that, in a verse like Gen. 17.8a ("And I will give to you, and to your descendants after you, the land of your sojournings, all the land of Canaan, for an everlasting possession"), which consists of one verb-initial clause, one might expect the CDL to produce the following result, with the most important division before the final member, the next most important division before the penultimate member, and so forth:

\*and I will give  
 wēnātattî<sup>1</sup>  
                   d3  
 to you and to your descendants after you  
 lēkā ūlēzar'ākā 'aḥārêkā  
   d2  
 the land of your sojournings all the land of Canaan  
 'et 'ereṣ mēgurêkā 'et kol 'ereṣ kēna'an  
   d1  
 for an everlasting possession  
 la'āḥuzzat 'ōlām  
   d0

Instead, it must be specified that the CDL treats the parts of members as separate members, so that the dichotomies are placed as follows:

and I will give to you  
 wēnātattî<sup>1</sup> lēkā  
   d4  
 and to your descendants after you  
 ūlēzar'ākā 'aḥārêkā  
   d3  
 the land of your sojournings  
 'et 'ereṣ mēgurêkā  
   d2  
 all the land of Canaan  
 'et kol 'ereṣ kēna'an  
   d1  
 for an everlasting possession  
 la'āḥuzzat 'ōlām  
   d0

Wickes' statement that the parts of compound members are treated by the accentuation as separate members is certainly not an explanation, and it is also not quite adequate even as a description of the syntactic incongruities of a half-verse like Gen.17.8a. It is inadequate in that it fails to note 1) that restrictivity may block the separation of the parts of the compound



member (see pp.118-123); 2) that accentual separation of a member into its parts does not occur if the member is distant from the verb (see phrasing rules 2.21 and 2.22, pp.155-173); 3) that the part of the compound member that immediately follows the verb is grouped with the verb (see my phrasing rule 2.27, p.188).

Apart from the failings just mentioned, Wickes' statement is compatible with my phrasing rules as a description of the "flattening" of members that follow the verb. Those rules operate as follows on Gen.17.8a:

wēnātattî  
 ( ( /v\ ) m/M

lĕkā ûlēzar'ākā 'ahărĕkā  
 ( [ /\ ] + [ /\ @ /\ ] ) M

'et 'ereṣ mĕgurĕkā 'et kol 'ereṣ kĕna'an  
 ( [ -/\ \* /\ ] = [ --/\ \* /\ ] ) MM

la'āḥuzat<sup>z</sup> 'ôlām  
 ( /\ ^ \* /\ ) )

2.12a, 2.17

( [ /v\ ] m/M

[ [ /\ ] + [ /\ /\ ] ] M

[ [ -/\ /\ ] = [ --/\ /\ ] ] MM

[ /\ /\ ] )

2.21a/b (first flattening)

( [ /v\ ] ■  
[ \Δ ] M  
[ \Δ \Δ ] M  
[ [ -\Δ \Δ ] = [ --\Δ \Δ ] ] MM  
[ \Δ \Δ ] )

2.22a/b (second flattening), 2.23b

( [ /v\ ] m  
[ \Δ ] M  
[ \Δ \Δ ] M  
[ -\Δ \Δ ] Z  
[ --\Δ \Δ ] Z  
[ \Δ \Δ ] )

2.27 (grouping of verb with following one-word member),  
2.29a/b

[ [ /v\ \Δ ]  
[ \Δ \Δ ]  
[ -\Δ \Δ ]  
[ --\Δ \Δ ]  
[ \Δ \Δ ] ]

3.2a

[ /v\ \Δ ]  
d4  
[ \Δ \Δ ]  
d3  
[ -\Δ \Δ ]  
d2  
[ --\Δ \Δ ]  
d1  
[ \Δ \Δ ]  
d0

With respect to the problem of syntactic incongruity, the focus of linguist Mark Aronoff is quite different from that of traditional scholars of the accents. He has very little to say about the accentual relations among independent clauses, but he tries to explain why Masoretic accentual groupings within many Biblical clauses differ so strikingly from what we would regard as the syntactic structure of those clauses. Central to his explanation is his assumption that the Masoretes devised the accents only incidentally to record or prescribe recitation, and chiefly to indicate how the text is to be parsed.

Aronoff follows Wickes et al. in taking it as given (p.34) that the accents are applied to Biblical verses according to a process of continuous dichotomy. He goes further than the others, however, in attributing (pp.52-57) a "parsing principle" to the Masoretes to account for the location of the dichotomies. Aronoff claims that this principle "accounts for the great bulk of Masoretic analyses, including those which differ from what a modern syntactician might expect." That is, it accounts for all "major constructions" except for topicalization and coordination. Specifically, it is supposed to tell us how the Masoretes parsed VPs and NPs and thereby show us the logic of the location of accentual dichotomies within those constructions -- the presumed logic of the Masoretes, that

is, which, by Aronoff's admission, often gives "intuitively unsatisfactory" results.

The parsing principle which Aronoff ascribes to the Masoretes is this:

Given a constituent of the category X,  
divide it in two in such a manner as  
to maximize its continuous subconsti-  
tuent(s) of the category X.

The whole of Gen.17.8a, for example, is a verb  
phrase:

And I will give to you and to your descendants after you  
wēnātattî lēkā ūlēzar'ākā 'aḥrēkā

the land of your sojournings all the land of Canaan  
'et 'ereṣ mēgurēkā 'et kol 'ereṣ kēna'an

for an everlasting possession  
la'aḥzzat 'ōlām

Aronoff claims that the first stage of Masoretic parsing of this verb phrase is to divide the whole into two continuous parts, one of which is the longest possible verb phrase that is shorter than the whole. Clearly, this is achieved by putting the break before the last prepositional phrase:

And I will give to you and to your descendants after you  
the land of your sojournings all the land of Canaan /I  
for an everlasting possession

The new constituent verb phrase must now in turn be divided. The parsing principle is fulfilled if the next

break comes between the appositions which make up the compound direct object of the verb, for the continuous sub-constituent to the left of that break is still a verb phrase:

And I will give to you and to your descendants after you the land of your sojournings /2 all the land of Canaan

The principle continues in the same manner until no sub-constituent consists of more than two words:

And I will give to you and to your descendants after you /3 the land of your sojournings

And I will give to you /4 and to your descendants after you

Similarly, for a noun phrase, like the subject of Ex.21.15 ("a striker of his father or his mother"), Aronoff's principle correctly gives the division that maximizes a continuous subconstituent noun phrase:

makkēh            'ābîw            / wē'immô  
a striker of his father    or his mother

Simply as a description of accent distribution, and with particular regard to the accentuation of compound members, Aronoff's parsing principle may offer a small improvement over the statement of Wickes that was discussed above, in that it seems to provide for the grouping of a verb with an immediately following one-word constituent. But it is still inadequate in two of the same ways. The less important inadequacy is that it does not take into

account the effect of restrictivity on accentual grouping. Thus, for example, it would give the wrong result for the noun phrase at the end of Gen. 3.5 ("knowers of good and evil"):

\*yōdē'ê     tōb / wārā'  
knowers of good     and evil

The rules that I presented in chapter III do give the correct result because they recognize that the syntactic relationship between tōb and wārā' is a restrictive one (see section 1.20, p.118ff.) that cannot be breached by rule 2.13a (p.147). The correct division of this noun phrase is:

yōdē'ê     / tōb wārā'  
knowers of     good and evil

This deficiency of Aronoff's parsing principle as quoted above could perhaps be patched up with a careful defining of "subconstituent" that would exclude words or phrases in restrictive relation to one another. More damaging is the other descriptive inadequacy that this principle shares with Wickes' statement, the failure to recognize that accentual separation of a member into its parts only occurs in members that are closest to the verb. Aronoff's principle would, for example, correctly divide the single-word direct objects that immediately follow the verb in the last clause of Gen. 5.4 ("and he begat sons and daughters"):

wayyôled bānîm / ûbânôt  
 and he begat sons and daughters

But, in the first clause of Ex.4.20 ("And Moses took his wife and his sons"), the single-word direct objects do not directly follow the verb, and Aronoff's principle would divide them incorrectly, as follows:

\*wayyiqqah mōseh /2 'et 'istô /1 wē'et bānāw  
 and took Moses his wife and his sons

The correct division emerges from the rules of chapter III:

wayyiqqah mōseh 'et 'istô wē'et bānāw  
 ( ( [v] ) M ( [ ] ) M ( -[ ] + -[ ] ) ) .....

2.12b, 2.17

< [ [v] ] M [ [ ] ] M [ -[ ] & -[ ] ] > .....

2.27, 2.29a/b, 3.2a

wayyiqqah mōseh / 'et 'istô wē'et bānāw  
 [ [v] [ ] ] [-[ ] -[ ] ].....  
                           d3                          d2                          d1                          d0

In the second line of the above derivation, the direct object [-[ ] & -[ ] ] cannot be affected by flattening rule 2.21 because that rule only applies to the first external member after the verb, and it cannot be affected by flattening rule 2.22 because that rule can breach only members whose principal bond is + = or Z . Rule 2.12b (see p.146) is an acknowledgment of the special closeness

that obtains intonationally between two single words connected serially; it insulates such a pair from the flattening effect of any verb except one that immediately precedes. The concept of maximization of constituents is inadequate to deal with the distinction which phrasing rules 2.12b, 2.21 and 2.22 provide.

See pp.167-170 for further examples of lack of flattening in a second post-verbal member whose principal bond is other than + = or Z .

Aronoff's principle would also maximize a subconstituent verb phrase in Ex.3.22a ("And each woman shall borrow from her neighbor and from her house-lodger objects of silver and objects of gold and clothing"), dividing the clause incorrectly, as follows:

*wēšā'ālāh	'iṣṣāh	miššēkentāh
and shall borrow	(each) woman	from her neighbor
umiggārat bētāh		kēlē kesep
and from her house-lodger		objects of silver
ûkēlē zāhāb	/ ûšēmālōt	
and objects of gold	and clothing	

The correct "first division" (wēšā'ālāh 'iṣṣāh miššēkentāh umiggārat bētāh / kēlē kesep ûklē zāhāb ûšēmālōt) emerges from the rules of chapter III:



wěšā'ālāh      'iṣṣāh miṣṣēkeritāh umiggārat bēṭāh  
 ( ( [ √ ] ) M ( [ ] ) M ( [ ] + [ \* ] ) ) M  
 kēlē kesep      ūkēlē zāhāb      ūṣēmālōt  
 ( [ \* ] + [ \* ] + [ ] ) )

2.12a, 2.17

( [ ] M [ ] M ( [ ] + [ ] ) ) M  
 ( [ ] + [ ] + [ ] ) )

2.22a/b

( [ ] M [ ] M [ ] M [ ] ) M  
 ( [ ] + [ ] + [ ] ) )

2.27, 2.29a/b, 3.2a

wěšā'ālāh		umiggārat
'iṣṣāh	miṣṣēkeritāh	bēṭāh /
[ [ √ ] ]	[ ]	[ [ ] ]
<b>d3</b>	<b>d2</b>	<b>d1</b>
kēlē kesep	ūkēlē zāhāb	ūṣēmālōt
[ [ ] ]	[ [ ] ]	[ [ ] ]
		<b>d0</b>

The sub-members of the direct object of this clause are connected to each other by + , one of the bonds that rule 2.22 can breach. But here the direct object is simply out of reach of the flattening effect of rule 2.22: the direct object of this clause is the fourth external post-verbal member, but the effect of the flattening rules does not extend past the second. Despite what Wickes asserts and Aronoff accepts, it is, as a matter of fact, not true that the several parts of a compound member are constantly treated by the accentuation as separate members. Such

treatment occurs only if the member is the first or the second external member following the verb.

Whatever persuasiveness there may be in Aronoff's parsing principle does not derive from its ability to explain Masoretic accentuation in the context of a general theory of how language works. Aronoff tells us, on the contrary, that his principle gives "intuitively unsatisfactory" analyses that "differ from what a modern syntactician might expect." This lack of explanatory power is not a problem for Aronoff because he regards Masoretic accentuation not as a fact of language but as an erroneous construct of linguists -- a construct, that is, of Masoretes qua linguists, experimenting with an interesting (though erroneous) theory of parsing.

The persuasiveness of Aronoff's principle depends rather on its adequacy and simplicity as a description of the system of accentuation that the Masoretes have supposedly devised to demonstrate their theory of parsing. The need for any principle to be descriptively adequate is, I presume, self-evident. The need, in this case, for the principle to be statable with simplicity is tied to the view that we are dealing here not with facts but, supposedly, with someone else's construct.

As linguists writing linguistic descriptions, we strive for simplifying insights, but we do not necessarily expect to be able to describe a set of facts in a

particular language with a few short and simple statements. We are not disturbed if our description must be complex as long as we can say of it, within a larger comparative and theoretical context, that it confirms or enriches our understanding of how languages work. Such a context provides a higher-level measure of simplicity. But perhaps, when we assume the role of investigators of past linguistic thought, we tend to look for and find instances of a lower-level kind of simplification; we may have trouble believing that ancient notations could convey the actual complexities and higher-level simplicities of a language. At any rate, Aronoff is certainly quite impressed with the "depth and elegance of the theory" that he attributes to the Masoretes, though he sees clearly that this theory derives little support from any general notions about language. Citing the attempts of Chomsky and Harris to organize phrase structure around a single principle, Aronoff proposes that Masoretic syntactic analysis, too, could have operated, albeit erroneously, in terms of a single principle.

If, despite its being linguistically unsatisfactory, Aronoff's simple parsing principle were an adequate description of the distribution of the Biblical accents, then we might reasonably be persuaded that the Masoretes did indeed have such a principle and that they devised the accents to express it. Of course, in accepting Aronoff's

formulation, we would not have learned anything about the language of the Hebrew Bible; we could consider ourselves enlightened only about the Masoretes themselves and about the history of linguistic theory and notation.

But I have shown that Aronoff's principle is not descriptively adequate. It could be made so only if it were supplemented with notions such as restrictivity, variety of intra-member bonds, externality vs. internality, distance from governing verb, etc. In other words, Aronoff's principle could be made descriptively adequate only if it were re-formulated along the lines of my rules 2.21 and 2.22 and if it then took its place among other rules and definitions that in their ensemble account for Biblical accentuation. Thus reduced, however, Aronoff's principle would have lost its elegant simplicity. Lost, too, would be much of the plausibility of attributing this principle to the Masoretes as the basis of their supposed syntactic analyses.

Furthermore, Aronoff's parsing principle is descriptively inadequate not only because it gives incorrect results, but also because it does not even try to account for some of the most interesting and difficult things about Biblical accentuation. Unlike my set of rules, Aronoff's principle is very limited in its application: it is meant to apply only to word-groups that consist wholly of a noun phrase or of a verb phrase.

Aronoff himself acknowledges, for example, that his principle has nothing systematic or predictive to say about topicalization (i.e., about how to subdivide a clause which consists of a noun phrase followed by a verb phrase). Nor does it have anything to say about where to put the divisions in a sequence of independent clauses (since often the divisions do not correspond to clause-ends). Rules 2.23, 2.25 and 2.26 of my grammar deal with these phenomena.

Incidentally, despite his notion that Masoretic syntactic analysis operated in terms of a single principle, Aronoff does propose (pp.46-50) a separate rule to deal with one problem that is not covered by his own parsing principle (and that is also not satisfactorily covered by any statement of Wickes'), namely the problem of how items in a series are grouped. Aronoff's attempted solution to this problem is his "Masoretic Conjunction Rule":

X --> X conj X  
Condition: expand from left to right  
at each level of analysis

But this rule too, like the parsing principle, is descriptively inadequate. For a series of three or four items, it will give the correct results, but for a series of five or six items, its results are wrong:

[1 2] [3]

[1 2] [3 4]

\*[ [1 2] [3] ] [4 5]

\*[ [1 2] [3 4] ] [5 6]

The correct results for five or six items are:

[1 2] [ [3 4] [5] ]

[1 2] [ [3 4] [5 6] ]

Thus, in Num. 26.33, for example, the accentual grouping of Šelophād's daughters would, by Aronoff's rule, be:

\*[ [Maḥlāh & No'āh] [& Ḥoglāh] ] [& Milkāh & Tiršāh]

But in the actual Masoretic text, the grouping is:

[Maḥlāh & No'āh] [ [& Ḥoglāh & Milkāh] [& Tiršāh] ]

I discussed and illustrated the phrasing of lists at some length in chapter II (pp.690-66), and, in chapter III, I provided rules 2.11a and 2.11b to deal with this phenomenon. Aronoff's "Masoretic Conjunction Rule" has, in other words, already been refuted in the course of this study. I have brought it into the present discussion for the sake of completeness in demonstrating the descriptive inadequacy of Aronoff's approach: his rules are inadequate both because they do not attempt to account for some

important things and because, in what they do attempt to account for, they give incorrect results.

Aronoff (along with Wickes and everyone else) correctly assumes that there is a non-arbitrary relation between Biblical accents and the syntax of the text. The relationship is clearly not straightforward, however: accentual groupings are often incongruous with the groupings that a normal parsing of the text would yield. In essence, Aronoff argues that, for Masoretic Hebrew, this syntactic incongruity of accentual word-groupings is only apparent, that the Masoretes devised the accentuation to express a parsing which is different from ours and with which the accentual groupings are not incongruous. We might be persuaded by this argument if Aronoff were able to offer a theory of Masoretic parsing that accounted adequately, even if in a linguistically erroneous way, for a reasonably wide range of the syntactic incongruities that are apparent to us.

If, in the absence of such a theory, we persist in trying rigorously to understand the relation between accentual grouping and the sort of parsing we are used to, we find that this relation can be adequately described, but only by a rather complex set of rules. This finding forces us, in puzzlement, to confront Aronoff's most basic claim: that the Masoretes devised the accents in order to express their understanding of how the Biblical text is parsed.

Could the Masoretes, we ask, have devised -- would they have devised -- such a complex set of rules to achieve such incongruous results?

In my account of how the accents work, there is no need to posit such devising. I have proposed that the Masoretic accents, like the punctuation marks to which we are accustomed, indicate the intonational phrasing of the text. The Masoretes, in recording and/or prescribing this phrasing, did not have to devise or even be conscious of the rules that relate it to syntax. That relation, sometimes straightforward and sometimes not, is implicit in the phrasing itself. (The task of a grammarian of the accents is to make the rules of that relation explicit.)

If they must be regarded as straightforward indices of syntactic structure, then many Masoretic accentual groupings are indeed, as Aronoff says, "intuitively unsatisfactory" and different "from what a modern syntactician might expect." As representations of intonational phrases, however, they can correspond quite well to our intuitions and to observable linguistic behavior, both oral and written, since incongruity between syntax and intonation is by no means the exclusive property of Masoretic Hebrew. An English translation of Gen. 17.8a - - the chief example that Aronoff uses to demonstrate his parsing principle -- can serve to illustrate my point:



And I give to you, and to your descendants after you, the land of your sojourn, all the land of Canaan, for an everlasting possession.

The punctuation marks in the above translation, found also in the RSV and the King James, correspond to the ends of intonational phrases in a likely oral rendition of the verse in English at a fairly deliberate tempo. The first two commas may be optional with a quicker tempo, but the last two are probably obligatory at any reasonable speed if the utterance is to sound well-formed.

Like the accentual groupings in the Masoretic text of this verse, the first three intonational phrases in the translation are "syntactically incongruous". (The first and third commas come in the middle rather than at the end of syntactic members.) The syntactic incongruity of the English phrasing is, in fact, so similar to that of the Hebrew that one wonders why Aronoff does not notice it. Should not the correspondence between Masoretic disjunctives and English punctuation marks have cast doubt on his description of the former as "intuitively unsatisfactory"? Or would he describe the English punctuation marks the same way, despite their appropriateness in marking off the very intonational phrases that one is likely to utter and hear? What sort of punctuation marks, if not these, would "a modern syntactician" expect and regard as satisfactory?

A basic theoretical confusion (pp.28-29) prevents Aronoff from asking and answering such questions as these. On the one hand, he declares his overarching aim to be study of the relation between orthography (punctuation marks, in particular) and linguistic theory (also referred to as linguistic analysis and "linguistic awareness"). On the other hand, he claims his ultimate aim to be understanding of "the true relation between written and spoken language".

These two aims are not identical, but Aronoff seems to think they are, and it is fairly easy to see how the confusion arises. Any compound sentence will do to demonstrate, e.g.:

The grass is green, and the sky is blue.

When this sentence is uttered in a deliberate tempo, it normally falls into two intonational phrases, one for each clause. By convention, English punctuation puts a comma in such a sentence, as above. Is this comma a mark of phrasing or of parsing? Does it mimic in writing the intonation of the utterance, or is it an independent signal of syntactic analysis? Sentences like this, in which intonation mirrors syntax, do not provide the basis for an answer to such a question. Here (and often) the relation between orthography (punctuation) and linguistic analysis

(underlying syntax) is indistinguishable from the relation between written and spoken language.

Elsewhere, however, when intonation does not mirror syntax, these relations are not so readily confused. Thus, in a case of syntactic incongruity like the translation of Gen. 17.8a, the commas clearly correspond to intonational phrases, but one would not ordinarily be tempted to characterize them as marks of syntactic analysis. Similarly, the use of commas in a list of more than two items corresponds to an intonational fact but not really to a syntactic one. In the following sentences, for example, presence vs. absence of a comma represents an intonational difference but not a difference of syntactic structure:

I like coffee and tea.

I like black coffee, herbal tea and chocolate milk.

Punctuation marks are primarily a written representation of the intonational aspect of speech. Their relation to syntax is not independent, but is a function of the relation of intonational phrases to syntax. If, therefore, we want to understand how punctuation marks are related to syntax, we must first understand how intonational phrases are related to syntax.

The punctuational usage with which we are most familiar is not, however, a very complete representation of intonational phrasing. If, for example, one knew nothing

of English phrasing but what commas and periods indicated, one would not realize that, at a deliberate tempo, the sentence "I like black coffee, herbal tea and chocolate milk" contains not two, but three phrases, the second of which consists of the words "herbal tea". One would also not realize that there is any phrasing at all within the sentence "This is the cat that caught the rat that stole the cheese." Masoretic accentuation seems, by contrast, to be a very full representation of intonational phrasing. In fact, the very completeness of its notation of word-groupings makes the Masoretic text an especially useful one for study of the rules which relate intonational phrasing to syntax.

Aronoff, too, regards the Masoretic system of punctuation as superior to more familiar ones -- not, however, because it more fully represents the intonational phrasing of utterance, but because of the "non-trivialness" of its supposed representation of syntactic analysis. He dismisses (p.55) the principles that govern most punctuation systems as "so trivial that they are easily ignored." They are trivial, presumably, because they do not consistently and clearly indicate how their text is to be parsed. But the model by which Aronoff makes his judgments is obviously not a system of punctuation of the sort one actually finds in practical use; instead, his model is modern linguistic syntactic theory. He admires

(p.29) Masoretic punctuation because of its "remarkably elegant syntactic theory, unsurpassed in descriptive power until very recently." For him (p.28), Masoretic punctuation is to be "considered as the product of linguistic analysis, rather than as a linguistic system per se"; its interest is not as language but as linguistics.

Approaching the Masoretic accents as linguistic analysis rather than as written language, Aronoff fails to see that they do what other actual punctuation systems do: represent the intonational phrasing of the text. Undoubtedly, this failure is connected to the fact that Aronoff's own linguistic theory does not allow for rules that relate intonational phrases to syntax. He considers and specifically rejects (p.67) the idea that the accents could represent the intonational phrasing of a traditional recitation. His rejection is based (implicitly) on the following argument: 1) in real language, the relation of intonation to syntax is fortuitous; 2) the relation of the accents to syntax is not fortuitous; 3) the accents cannot (therefore) represent real-language intonation.

About the second premise of this argument, I do not, of course, disagree. I have demonstrated, however, that the rules which govern the relation of the accents to syntactic structure are much more complex than Aronoff has realized, complex in a way that seems to preclude the possibility of their being a Masoretic device, as he has

supposed them to be. In fact, my demonstration of the inadequacy of Aronoff's formulation of the second premise (i.e., of his description of the relation of the accents to syntax) already tends to challenge the adequacy of the more theoretical first premise of the argument that I have ascribed to him above. For, if the Masoretic accentual groupings are not arbitrarily related to syntax and if they are also not a product of conscious linguistic devising, then, one might ask, what can they be based on if not some version of real-language phrasing? But, if so, then the first of the above premises is contradicted, since, at least with respect to Biblical Hebrew, it cannot be said that the relation of real-language intonation to syntax is fortuitous.

What I have been calling "syntactic incongruity" has been the subject of some linguistic discussion since Chomsky and Halle noted (SPE, p.372) that 1) syntactic strings that exceed a certain level of complexity and length must be reduced to "phonological phrases" in order for the rules of the phonological component to operate on them; 2) the intonational structure -- i.e., the phrasing -- of an utterance does not necessarily correspond to its syntactic structure (their famous example is "This is the cat that caught the rat that stole the cheese"). In light of these two observations, Chomsky and Halle suggested (but declined to try to elaborate) that a grammar must contain

"readjustment rules" to account for the "reduction" or "flattening" of syntactic structure into intonational phrases.

Aronoff's position -- that the relation of intonation to syntax is fortuitous -- is in opposition to the idea that a grammar needs readjustment rules. I think this position will also turn out to be a stumbling-block for any "modern syntactician" who wants to understand the workings of punctuation marks and intonational phrases in general and of Masoretic accentuation in particular. How has Aronoff arrived at this position and what is the evidence for it?

I shall not myself try to review the literature on this issue here, but a fairly complete review, as well as a statement of a position like Aronoff's, can be found in section 5.4 ("Intonational Phrasing") of Phonology and Syntax by Elisabeth Selkirk.<sup>3</sup> Since her book is quite recent and takes into account what has been written to date on the subject, and since, furthermore, Aronoff cites her earlier work to support his own, it seems reasonable to look to Selkirk's treatment of intonational phrasing for answers to the questions I have just posed. She is quite explicit and clear (p.285) in opposing the idea that the

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3. Elisabeth Selkirk, Phonology and Syntax: The Relation between Sound and Structure (Cambridge, Massachusetts: The MIT Press, 1984), pp.284-296. All mentions of Selkirk in this study refer to this book, as do all page numbers inserted in discussion of Selkirk's views.

relation between intonation and syntax is governed by rules:

...on different utterances, the same sentence may be differently partitioned into intonational phrases. In other words, the syntactic structure of a sentence cannot be said to determine its intonational phrasing...Thus the relation between syntactic structure and all aspects of intonational structure can be depicted as a one-to-many mapping.

Selkirk illustrates (pp.292-293) the kind of one-to-many mapping she has in mind with the sentence "Jane gave the book to Mary", for which, she says, all but two of the following are all well-formed intonational phrasings:

- a. [Jane gave the book to Mary]
- b. [Jane] [gave the book to Mary]
- c. [Jane gave the book] [to Mary]
- d. [Jane gave] [the book] [to Mary]
- e. \*[Jane] [gave] [the book to Mary]
- f. \*[Jane gave] [the book to Mary]
- g. [Jane] [gave the book] [to Mary]
- h. [Jane] [gave] [the book] [to Mary]

Selkirk explains the ungrammaticality of e and f above as due to the fact that the phrase [the book to Mary] , which both contain, violates a Sense Unit Condition that constrains intonational phrasing. In compressed form, her claim (pp.290-292) is that two or more syntactic



constituents of an intonational phrase can form a "sense unit" only if they are related to each other as argument to head or as modifier to head. Neither relation obtains between "the book" and "to Mary" and, therefore, \*[the book to Mary] is ungrammatical as an intonational phrase.

Even if Selkirk's Sense Unit Condition could separate all intonational phrasings into the grammatical and the ungrammatical, it would still not be clear why she characterizes intonational phrasing as syntactically free. Her Condition seems to be wholly definable in syntactic terms, despite her claim that the Sense Unit Condition operates at "some level of semantic representation" that occurs later than and is not determined by the output of the syntactic component. It would be pointless, however, to devote space here to challenging the theoretical difficulties of her claim, because the Sense Unit Condition is not satisfactory even as a description of the kind of intonational phrasing that Chomsky and Halle saw as a problem and that the Masoretic accents often represent. Accordingly, I shall focus now on the descriptive inadequacy of Selkirk's position.

Selkirk seems to think (pp.293-294) that she has dealt with the "much-discussed example of a sentence whose 'phonological' phrasing is at odds with its syntactic phrasing," namely, [This is the cat] [that caught the rat] [that stole the cheese]. Each of these intonational phrases, she explains

is well formed according to the Sense Unit Condition. Consequently, we do have a theory of why this sentence should be able to have this particular phrasing.

What needs explaining, however, is not that the sentence can have "this particular phrasing", but that it must. For this sentence, the Sense Unit Condition is quite inadequate for separating grammatical from ungrammatical intonational phrasings. It would permit the following phrasings, for example, despite the fact that, in normal utterance, without emphasis and at a reasonably deliberate tempo, they do not occur:

\*[This]  
[is the cat that caught the rat that stole the cheese]

\*[This is]  
[the cat that caught the rat that stole the cheese]

\*[This is] [the cat that caught]  
[the rat that stole the cheese]

\*[This is the cat that caught]  
[the rat that stole the cheese]

Selkirk says that this "much-discussed example... simply illustrates that the intonational phrasing assigned to a sentence is not necessarily isomorphic to its syntactic phrasing." One might infer from her statement that this sentence's phrasing is optionally non-isomorphic. But that inference is false: in fact, this sentence's phrasing is necessarily non-isomorphic. Furthermore, its

phrasing must be non-isomorphic in one particular way; the relation between its syntax and its intonation can not be depicted as a one-to-many mapping.

The readjustment rules that Chomsky and Halle proposed were meant to apply to syntactic "strings that exceed a certain level of complexity or a certain length." But the factors of complexity and length have been overlooked in Selkirk's formulation of the relation between syntactic structure and intonational phrasing, and, in their absence, readjustment rules seem, not surprisingly, quite superfluous. Her sentence "Jane gave the book to Mary" has no lengthy or complex components to be flattened or reduced. In fact, one would expect that a normal utterance of this sentence, unmarked by emphasis, would be a single and simple intonational phrase, isomorphic (one might say) with the singleness and simplicity of the syntactic structure. (The equivalent of this sentence in Masoretic Hebrew would be accented as a single uninterrupted countdown.)

What of the "variety of well-formed intonational phrasings" that Selkirk attributes to this sentence? Consider the last of them, for instance. Would anyone really utter this simple sentence in four phrases -- [Jane] [gave] [the book] [to Mary] -- as Selkirk supposes? I can imagine phrasing this way only when dictating to a child or

to a very slow stenographer. Or consider the second on Selkirk's list: [Jane] [gave the book to Mary]. That is certainly a possible phrasing, but one would normally expect to find it only if some emphasis were being given to "Jane". (Something like the Sense Unit Condition may, in fact, turn out to be useful in defining possible locations for emphasis in a sentence.)

To get a sense of non-emphatic intonational phrases actually encountered in ordinary utterance, one needs to try out sentences that are longer and more complex than what Selkirk has chosen. For example, the sentence "Jane gave a book to the most deserving pupil in each of her classes", if uttered at a deliberate tempo and without special emphasis to any part, is likely to fall into two phrases: [Jane gave a book] [to the most deserving pupil in each of her classes]. This phrasing can, I venture to say, be described as a function of the syntactic structure of the sentence -- not, to be sure, simply as a function of syntactic labels, but as a function of the labels and the lengths and the complexities of the syntactic components.

Obviously, I do not expect to resolve here the rather large question of how intonational phrasing is related to syntactic structure. My intention, in briefly discussing part of Selkirk's work, has been merely to suggest that her opposition to the idea of readjustment rules is almost surely wrong and is based on a too shallow investigation of

the phenomena that they are supposed to explain. A deeper investigation must involve a substantial corpus of sentences, including especially those with long and complex components, and it must abstract away from the effects of emphasis and of tempo variation. Aronoff, sharing Selkirk's view that the relation between intonational phrasing and syntactic structure is not rule-governed but fortuitous, is prevented from understanding that the relation of the Masoretic accents to syntax is via their representation of intonational phrasing. In fact, the Masoretic text of Bible, with its detailed and consistent notation of intonational phrases, is, as I have tried to show in this study, quite a fertile field for inquiry into the relation between syntax and intonation.

## ABOUT SOME NOTATIONS IN THE APPENDICES

When a pair of brackets that is contained within some other bracketing (brackets, parentheses, elbows, braces) encloses exactly the same words and bonds as that other bracketing, then the pair of brackets may optionally, for the sake of visual perspicuity, be deleted. Thus,

( [  $\Delta$  \*  $\Delta$  ] ) may appear as (  $\Delta$  \*  $\Delta$  )

To indicate that a cycle of the phrasing rules is beginning to operate on an embedded clause, the number of the first applicable rule is preceded by [ . When that cycle is finished, the number of the last applicable rule of the cycle is followed by ] . Thus, for Gen.1.1, the first phrasing rule that operates on the embedded clause is given as [2.12b . The last phrasing rule that operates on the embedded clause is given as 2.28c] .

When a cycle of phrasing rules operates on a clause that is doubly embedded, the number of the first applicable rule is preceded by [[ , and the number of the last applicable rule is followed by ] (only one closing bracket because now the phrasing rules will operate on the singly embedded clause which includes the doubly embedded one). See Gen.1.11 for an example.

"n/n" means "not necessary"; "n/a" means "not applicable".

APPENDIX A

EXAMPLES ILLUSTRATING INTRA-MEMBER PHRASING RULES

includes:

Gen. 27.15, 29.10

Ex. 3.1, 3.17

Gen. 27.15: ...'et bigdê 'ēšāw bēnāh haggādōl haḥāmudōt  
'āšer 'ittāh babbāyit...

( [ [ [-△] \* [ [△] ≡ [△ = △] ] ] = [△] ] = [-△ △] )

2.12a

( [ [ [-△] \* [ [△] ≡ [△ △] ] ] = [△] ] = [-△ △] )

2.13a

( [ [ [-△] \* [△] ≡ [△ △] ] = [△] ] = [-△ △] )

2.13b

( [ [ [-△ △] ≡ [△ △] ] = [△] ] = [-△ △] )

2.16b

( [ [ [-△ △] [△ △] ] = [△] ] = [-△ △] )

2.17

[ [ [ [-△ △] [△ △] ] = [△] ] = [-△ △] ]

-----  
 Gen. 29.10: ...'et rāḥēl bat lābān 'āḥî 'immô wē'et sô'r  
 lābān 'āḥî 'immô...

( [ [-Δ] ] ≡ [ [-Δ] ] ≡ [ Δ \* Δ ] ] )  
 + [ [-Δ] ] \* [ [ Δ ] ] ≡ [ Δ \* Δ ] ] ] )

2.12a

( [ [-Δ] ] ≡ [ [-Δ] ] ≡ [ Δ Δ ] ] )  
 + [ [-Δ] ] \* [ [ Δ ] ] ≡ [ Δ Δ ] ] ] )

2.13a

( [ [-Δ] ] ≡ [ [-Δ] ] ≡ [ Δ Δ ] ] )  
 + [ [-Δ] ] \* [ [ Δ ] ] ≡ [ Δ Δ ] ] ] )

2.13b

( [ [-Δ] ] ≡ [ [-Δ] ] ≡ [ Δ Δ ] ] )  
 + [ [-Δ Δ] ] ≡ [ Δ Δ ] ] ] )

2.16b

( [ [-Δ] ] = [ [-Δ] ] [ Δ Δ ] ] )  
 + [ [-Δ Δ] ] [ Δ Δ ] ] ] )

2.17

[ [ [-Δ] ] = [ [-Δ] ] [ Δ Δ ] ] ] )  
 + [ [-Δ Δ] ] [ Δ Δ ] ] ] )



---

Ex.3.1: ...'et šō'n yitrô hōtēnô kōhēn midyān...

( [ -△ ] \* [ [ △ ] ≡ [ △ ] = [ △ \* △ ] ] )

2.11a

( [ -△ ] \* [ [ [ △ ] ≡ [ △ ] ] = [ △ \* △ ] ] )

2.12a

( [ -△ ] \* [ [ △ △ ] = [ △ △ ] ] )

2.13a

( [ -△ ] \* [ △ △ ] = [ △ △ ] )

2.13b

( [ [ -△ ] [ △ △ ] ] ≡ [ △ △ ] )

2.17

[ [ [ -△ ] [ △ △ ] ] ≡ [ △ △ ] ]

---

Ex.3.17: ...'el 'ereṣ hakkēna'ānî wēhaḥittî wēhā'emōrî  
wēhapperizî wēhaḥiwwî wēhaybūsi 'el 'ereṣ zābat ḥālāb  
ūdebās.

( [ [ -△ ] \* [ △ + △ + △ + △ + △ + △ ] ]  
= [ [ -△ ] ≡ [ [ △ ] \* [ △ + △ ] ] ] )

2.11a

$$\begin{aligned} & ( [ [-\Delta] ] * [ [ \Delta + \Delta ] + [ \Delta + \Delta ] + [ \Delta + \Delta ] ] ] ) \\ & = [ [-\Delta] ] \equiv [ [ \Delta ] * [ \Delta + \Delta ] ] ] ) \end{aligned}$$

2.11b

$$\begin{aligned} & ( [ [-\Delta] ] * [ [ \Delta + \Delta ] + [ [ \Delta + \Delta ] + [ \Delta + \Delta ] ] ] ] ) \\ & = [ [-\Delta] ] \equiv [ [ \Delta ] * [ \Delta + \Delta ] ] ] ) \end{aligned}$$

2.12b

$$\begin{aligned} & ( [ [-\Delta] ] * [ [ \Delta & \Delta ] + [ [ \Delta & \Delta ] + [ \Delta & \Delta ] ] ] ] ) \\ & = [ [-\Delta] ] \equiv [ [ \Delta ] * [ \Delta & \Delta ] ] ] ) \end{aligned}$$

2.13a

$$\begin{aligned} & ( [ [-\Delta] ] * [ [ \Delta ] & [ \Delta ] + [ [ \Delta & \Delta ] + [ \Delta & \Delta ] ] ] ] ) \\ & = [ [-\Delta] ] \equiv [ [ \Delta ] * [ \Delta ] & [ \Delta ] ] ] ) \end{aligned}$$

2.13b

$$\begin{aligned} & ( [ [ [-\Delta \Delta ] ] & [ \Delta ] ] + [ [ [ \Delta & \Delta ] + [ \Delta & \Delta ] ] ] ] ) \\ & = [ [-\Delta ] ] \equiv [ [ [ \Delta \Delta ] ] & [ \Delta ] ] ] ) \end{aligned}$$

2.14a

$$\begin{aligned} & ( [ [ [-\Delta \Delta ] ] & [ \Delta ] ] + [ [ [ \Delta & \Delta ] + [ \Delta & \Delta ] ] ] ] ) \\ & = [ [-\Delta ] ] \equiv [ [ \Delta \Delta ] ] & [ \Delta ] ] ) \end{aligned}$$

2.14b

$$\begin{aligned} & ( [ [ [-\Delta \Delta] \& [ \Delta ] ] + [ [ \Delta \& \Delta ] + [ \Delta \& \Delta ] ] ] ) \\ & = [ [ [-\Delta ] \cong [ \Delta \Delta ] ] + [ \Delta ] ] ) \end{aligned}$$

2.15

$$\begin{aligned} & ( [ [ [-\Delta \Delta] \& [ \Delta ] ] + [ [ \Delta \& \Delta ] + [ \Delta \& \Delta ] ] ] ) \\ & = [ [ [-\Delta ] \cong [ \Delta \Delta ] ] + [ \Delta ] ] ) \end{aligned}$$

2.16a

$$\begin{aligned} & ( [ [ [-\Delta \Delta] [ \Delta ] ] + [ [ \Delta \Delta ] + [ \Delta \Delta ] ] ] ) \\ & = [ [ [-\Delta ] [ \Delta \Delta ] ] + [ \Delta ] ] ) \end{aligned}$$

2.17

$$\begin{aligned} & [ [ [ [-\Delta \Delta] [ \Delta ] ] + [ [ \Delta \Delta ] + [ \Delta \Delta ] ] ] ] \\ & = [ [ [-\Delta ] [ \Delta \Delta ] ] + [ \Delta ] ] ] \end{aligned}$$

APPENDIX B

EXAMPLES ILLUSTRATING INTER-MEMBER PHRASING RULES

includes:

Gen. 10.26, 18.18, 19.24, 31.17, 32.22, 45.8b

Ex. 24.4, 34.23, 40.12

Lev. 9.14, 27.34

Deut. 19.2, 27.16a, 32.44

II Sam. 3.38

I K. 11.1

Est. 1.5

Gen. 10.26: weyoqtān yālad 'et 'almôdād wě'et šālep wě'et  
hāšarmāwet wě'et yārah

( ( Δ ) M ( √Δ ) M ( -Δ + -Δ + -Δ + -Δ ) )

2.11a

( ( Δ ) M ( √Δ ) M ( [-Δ + -Δ ] + [-Δ + -Δ ] ) )

2.12b

( ( Δ ) M ( √Δ ) M ( [-Δ & -Δ ] + [-Δ & -Δ ] ) )

2.15 n/n

2.16a

( ( Δ ) M ( √Δ ) M ( [-Δ -Δ ] + [-Δ -Δ ] ) )

2.17

( [ Δ ] M [ √Δ ] M [ [-Δ -Δ ] + [-Δ -Δ ] ] )

2.21a

( [ Δ ] M [ √Δ ] M [ [-Δ -Δ ] + [-Δ -Δ ] ] )

2.21b

< [ Δ ] M [ √Δ ] M [-Δ -Δ ] Z [-Δ -Δ ] >

2.26a

< [ Δ ] M [ [ √Δ ] M [-Δ -Δ ] ] Z [-Δ -Δ ] >

2.29a

2.29b

[ [ Δ ] [ [ √Δ ] [-Δ -Δ ] ] [-Δ -Δ ] ]

needs pacing adj after countdown

-----  
Gen. 18.18a: wě'abrāhām hāyô yihveh lěgôy gādôl wě'āsûm

< ( Δ ) M (- √Δ ) M ( [ Δ ] = [ Δ + Δ ] ) >

2.12b

< ( Δ ) M (- √Δ ) M ( [ Δ ] = [ Δ & Δ ] ) >

2.14a

< ( Δ ) M (- √Δ ) M ( [ Δ ] = [ Δ ] & [ Δ ] ) >

2.14b

< ( Δ ) M (- √Δ ) M ( [ [ Δ ] = [ Δ ] ] & [ Δ ] ) >

2.15b

< ( Δ ) M (- √Δ ) M ( [ [ Δ ] [ Δ ] ] & [ Δ ] ) >

2.17

< [ Δ ] M [- ΔvΔ ] M [ [ [ Δ ] [ Δ ] ] & [ Δ ] ] >

2.21a

< [ Δ ] M [- ΔvΔ ] M [ [ [ Δ ] [ Δ ] ] & [ Δ ] ] >

2.21b

< [ Δ ] M [- ΔvΔ ] M [ [ Δ ] [ Δ ] ] M [ Δ ] >

2.26a

< [ Δ ] M [ [- ΔvΔ ] M [ [ Δ ] [ Δ ] ] M [ Δ ] ] >

2.29a

2.29b

[ [ Δ ] [ [- ΔvΔ ] [ [ Δ ] [ Δ ] ] [ Δ ] ] ]

-----  
Gen. 19.24: waYHWH hintîr 'al sēdōm wē'al 'āmōrāh goprît  
wā'eš mē'ēt YHWH min haššāmāyim

< (Δ) M (ΔvΔ) M (-Δ + -Δ) M (Δ + Δ) MM (-Δ = -Δ) >

2.12a

< (Δ) M (ΔvΔ) M (-Δ + -Δ) M (Δ + Δ) MM (-Δ -Δ) >

2.12b

< (Δ) M (ΔvΔ) M (-Δ & -Δ) M (Δ & Δ) MM (-Δ -Δ) >

2.17

< [△] M [▽] M [-△ & -△] M [△ & △] MM [-△ -△] >

2.21a

< [△] M [▽] M [-△ ] & [-△] M [△ & △] MM [-△ -△] >

2.21b

< [△] M [▽] M [-△ ] M [-△] M [△ & △] MM [-△ -△] >

2.23b

< [△] M [▽] M [-△ ] M [-△] Z [△ & △] Z [-△ -△] >

2.24

< [△] M [▽] M [-△ ] M [-△] Z [△ △] Z [-△ -△] >

2.26a

< [△] M [ [▽] M [-△ ] M [-△] ] Z [△ △] Z [-△ -△] >

2.27

< [△] M [ [▽ -△] M [-△] ] Z [△ △] Z [-△ -△] >

2.29a

2.29b

[ [△] [ [▽ -△] [-△] ] [△ △] [-△ -△] ]

-----  
Gen. 31.17b: wayyāqom ya'āqōb wayyiśśā' 'et bānāw wē'et  
nāsāw 'al haggēmāllîm (v. also II K. 17.17)

< ( ( √ ) M ( ) ) > < ( ( √ ) M ( - + - ) MM ( ) ) >

2.12b

< ( ( √ ) M ( ) ) > < ( ( √ ) M ( - & - ) MM ( ) ) >

2.17

< [ ( √ ) ] M [ ( ) ] > < [ ( √ ) ] M [ - & - ] MM [ ( ) ] >

2.21a n/a

2.23d n/a

2.24

< [ ( √ ) ] M [ ( ) ] > < [ ( √ ) ] M [ - - ] MM [ ( ) ] >

2.27

< [ ( √ ) ( ) ] > < [ ( √ ) ] M [ - - ] MM [ ( ) ] >

2.29a

2.29b

[ [ ( √ ) ( ) ] ] [ ( √ ) ] [ - - ] [ ( ) ] ]



-----  
 Gen. 32.22: wayyāqom ballaylāh hū' wayyiqqah 'et šte nāšaw  
 we'et šte šiphōtāw we'et 'ahad 'āsār yēlādāw wayya'ābōr 'et  
 ma'ābar yabbōq

after intra-member rules

< [ /v\ ] MM [ \\_ \\_ ] >

< [ /v\ ] M [ [-\\_ \\_ ] + [-\\_ \\_ ] + [-\\_ \\_ ] ] >

< [ /v\ ] M [-\\_ \\_ ] >

2.21a

< [ /v\ ] MM [ \\_ \\_ ] >

< [ /v\ ] M [-\\_ \\_ ] + [-\\_ \\_ ] + [-\\_ \\_ ] >

< [ /v\ ] M [-\\_ \\_ ] >

2.21b

< [ /v\ ] MM [ \\_ \\_ ] >

< [ /v\ ] M [-\\_ \\_ ] M [-\\_ \\_ ] Z [-\\_ \\_ ] >

< [ /v\ ] M [-\\_ \\_ ] >

2.26b

< [ [ /v\ ] MM [ \\_ \\_ ] ] "M"

[ [ /v\ ] M [-\\_ \\_ ] M [-\\_ \\_ ] ] Z [-\\_ \\_ ] >

< [ /v\ ] M [-\\_ \\_ ] >

2.29a

2.29b

[ [ [ /v\ ] [ \\_ \\_ ] ]

[ [ /v\ ] [-\\_ \\_ ] [-\\_ \\_ ] ] [-\\_ \\_ ] ]

[ [ /v\ ] [-\\_ \\_ ] ]

-----  
 Gen. 45.8b: wayśîmēnî lē'āb lēpar'ōh ūlē'ādōn lēkol bētō  
 ūmōsēl bēkol 'ereṣ miṣrāim

< ( ( √∆ ) M ( [ ∆ @ ∆ ] + [ ∆ @ -∆ ] +  
 [ [ ∆ ] @ [-∆ \* ∆ ] ] ) )

2.12a  
 2.17

< [ √∆ ] M [ [ ∆ @ ∆ ] + [ ∆ @ -∆ ] +  
 [ [ ∆ ] @ [-∆ ∆ ] ] ]

2.21a  
 2.21b

< [ √∆ ] M [ ∆ @ ∆ ] M [ ∆ @ -∆ ] M  
 [ [ ∆ ] @ [-∆ ∆ ] ]

2.21a repeat  
 2.21b repeat

< [ √∆ ] M [ ∆ ] M [ ∆ ] M [ ∆ @ -∆ ] M  
 [ [ ∆ ] @ [-∆ ∆ ] ]

2.23b  
 2.24

< [ √∆ ] M [ ∆ ] M [ ∆ ] Z [ ∆ -∆ ] Z  
 [ [ ∆ ] [-∆ ∆ ] ]

2.27  
 2.29a  
 2.29b

[ [ √∆ ∆ ] [ ∆ ] [ ∆ -∆ ] [ [ ∆ ] [-∆ ∆ ] ] ]

-----  
 Ex.24.4: wayyiktōb mōseh 'ēt kol dibrê YHWH wayyaškēm  
 babbōqer wayyiben mizbēah taḥat hāhār uštēm 'esrēh maṣṣēbah  
 lišnēm 'āsār sibtê yisrā'ēl

after cycle has operated on first two clauses

< [ √ ] [ ] [ -- ] >  
 < [ √ ] [ ] > < [ √ ] M [ [ ] @ [ ] ] >  
 + [ [ ] @ [ [ ] [ ] ] ] >

2.21a twice

2.21b twice

< [ √ ] [ ] [ -- ] >  
 < [ √ ] [ ] > < [ √ ] M [ ] MM [ ] ] >  
 M [ [ ] @ [ [ ] [ ] ] ] >

2.23a

< [ √ ] [ ] [ -- ] >  
 < [ √ ] [ ] > < [ √ ] M [ ] MM [ ] ] >  
 Z [ [ ] @ [ [ ] [ ] ] ] >

2.24

< [ √ ] [ ] [ -- ] >  
 < [ √ ] [ ] > < [ √ ] M [ ] MM [ ] ] >  
 Z [ [ ] @ [ [ ] [ ] ] ] >

2.26b

< [ [ √∆ ] [ ∆ ] [ --∆ ∆ ] ] >  
< [ [ [ √∆ ] [ ∆ ] ] [ [ √∆ ] M [ ∆ ] MM [ ∆ ∆ ] ] ] >  
Z [ [ -∆ ∆ ] [ [ -∆ ] [ ∆ ∆ ] ] ] >

2.26b (repeat)

< [ [ [ √∆ ] [ ∆ ] [ --∆ ∆ ] ] ] >  
[ [ [ [ √∆ ] [ ∆ ] ] [ [ √∆ ] M [ ∆ ] MM [ ∆ ∆ ] ] ] ] >  
Z [ [ -∆ ∆ ] [ [ -∆ ] [ ∆ ∆ ] ] ] >

2.27

2.29a

2.29b

[ [ [ [ √∆ ] [ ∆ ] [ --∆ ∆ ] ] ] ] >  
[ [ [ [ √∆ ] [ ∆ ] ] [ [ √∆ ∆ ] [ ∆ ∆ ] ] ] ] >  
[ [ -∆ ∆ ] [ [ -∆ ] [ ∆ ∆ ] ] ] ] >

-----  
Ex.34.23: šālōš pē'āmîm baššānāh yērā'eh kol zékûrēkā 'et  
pēnē hā'ādōn YHWH 'ēlōhē yiśrā'ēl

< ( [ ∆ = ∆ ] @ [ ∆ ] ) MM ( √∆ ) M ( -∆ )  
M ( [ -∆ ] \* [ [ ∆ ] = [ ∆ ] = [ ∆ \* ∆ ] ] ) >

2.11a

< ( [ ∆ = ∆ ] @ [ ∆ ] ) MM ( √∆ ) M ( -∆ )  
M ( [ -∆ ] \* [ [ ∆ = ∆ ] = [ ∆ \* ∆ ] ] ) >

2.12a

$$\langle \langle [ \Delta \Delta ] @ [ \Delta ] \rangle MM ( \Delta \Delta ) M ( -\Delta ) \rangle$$

$$M \langle [ -\Delta ] * [ [ \Delta \Delta ] = [ \Delta \Delta ] ] \rangle \rangle$$

2.13a

$$\langle \langle [ \Delta \Delta ] @ [ \Delta ] \rangle MM ( \Delta \Delta ) M ( -\Delta ) \rangle$$

$$M \langle [ -\Delta ] * [ \Delta \Delta ] = [ \Delta \Delta ] \rangle \rangle$$

2.13b

$$\langle \langle [ \Delta \Delta ] @ [ \Delta ] \rangle MM ( \Delta \Delta ) M ( -\Delta ) \rangle$$

$$M \langle [ [ -\Delta ] [ \Delta \Delta ] ] = [ \Delta \Delta ] \rangle \rangle$$

2.16

$$\langle \langle [ \Delta \Delta ] [ \Delta ] \rangle MM ( \Delta \Delta ) M ( -\Delta ) \rangle$$

$$M \langle [ [ -\Delta ] [ \Delta \Delta ] ] = [ \Delta \Delta ] \rangle \rangle$$

2.17

$$\langle [ [ \Delta \Delta ] [ \Delta ] ] MM [ \Delta \Delta ] M [ -\Delta ] \rangle$$

$$M [ [ [ -\Delta ] [ \Delta \Delta ] ] = [ \Delta \Delta ] ] \rangle$$

2.22a n/a

2.23c n/a

2.24

$$\langle [ [ \Delta \Delta ] [ \Delta ] ] MM [ \Delta \Delta ] M [ -\Delta ] \rangle$$

$$M [ [ [ -\Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] \rangle$$

2.26a

$$\langle [ [ \Delta \Delta ] [ \Delta ] ] MM$$

$$[ [ \Delta \Delta ] M [ -\Delta ] M [ [ -\Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] \rangle$$

2.27

$\langle [ [ \Delta \Delta ] [ \Delta ] ] MM$   
 $[ [ \Delta \Delta - \Delta ] M [ [ [-\Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] ] \rangle$

2.29a

2.29b

$[ [ [ \Delta \Delta ] [ \Delta ] ]$   
 $[ [ \Delta \Delta - \Delta ] [ [ [-\Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] ] \rangle$

Ex.40.12a: wēhiqrabtā 'et 'ahārōn wē'et bānāw 'el petah  
'ōhel mō'ēd wērāḥṣtā 'ōtām bāmmāyim

$\langle ( \Delta \Delta ) M ( -\Delta + -\Delta ) MM ( [ -\Delta ] * [ \Delta * \Delta ] ) \rangle$   
 $\langle ( \Delta \Delta ) m ( \Delta ) MM ( \Delta ) \rangle$

2.12a

2.12b

$\langle ( \Delta \Delta ) M ( -\Delta & -\Delta ) MM ( [ -\Delta ] * [ \Delta \Delta ] ) \rangle$   
 $\langle ( \Delta \Delta ) m ( \Delta ) MM ( \Delta ) \rangle$

2.13b

$\langle ( \Delta \Delta ) M ( -\Delta & -\Delta ) MM ( [ -\Delta ] [ \Delta \Delta ] ) \rangle$   
 $\langle ( \Delta \Delta ) m ( \Delta ) MM ( \Delta ) \rangle$

2.17

$\langle [ \Delta \Delta ] M [ -\Delta & -\Delta ] MM [ [ -\Delta ] [ \Delta \Delta ] ] \rangle$   
 $\langle [ \Delta \Delta ] m [ \Delta ] MM [ \Delta ] \rangle$

2.21a

< [ [v] ] M [-] & [ [-] ] MM [ [-] ] [ [ ] ] >  
 < [ [v] ] m [ [ ] ] MM [ [ ] ] >

2.21b

< [ [v] ] M [-] M [-] MM [ [-] ] [ [ ] ] >  
 < [ [v] ] m [ [ ] ] MM [ [ ] ] >

2.23b

< [ [v] ] M [-] M [-] Z [ [-] ] [ [ ] ] >  
 < [ [v] ] m [ [ ] ] MM [ [ ] ] >

2.27

< [ [v] - ] M [-] Z [ [-] ] [ [ ] ] >  
 < [ [v] ] [ [ ] ] MM [ [ ] ] >

2.29a

2.29b

[ [ [v] - ] [-] ] [ [-] ] [ [-] ] [ [ ] ] >  
 [ [ [v] ] [ [ ] ] [ [ ] ] ]

---

Lev.9.14: wayyirḥaṣ 'et haqqereb wě'et hakkēra'im  
 wayyaqṭēr 'al hā'ōlāh hammizbēhāh  
 < ( [v] ) M ( - + - ) > < ( [v] ) M ( - ) MM ( [ ] ) >

2.12b

< ( ( /v\ ) M (-/\ & -/\ ) ) < ( ( /v\ ) M (-/\ ) MM ( /\ ) ) >

2.17

< [ ( /v\ ] M [-/\ & -/\ ] > < [ ( /v\ ] M [-/\ ] MM [ /\ ] >

2.21a

2.21b

< [ ( /v\ ] M [-/\ ] M [-/\ ] > < [ ( /v\ ] M [-/\ ] MM [ /\ ] >

2.23d r/a

2.27

2.29a

2.29b

[ [ ( /v\ -/\ ] [-/\ ] ] [ [ ( /v\ -/\ ] [ /\ ] ] ]

Lev.27.34: 'ēlleh hammiṣwôt 'ăser ṣiwwāh YHWH 'et mōšeh  
'el bēnē yisrā'ēl bēhar sīnāy

< ( [-/\ ] = [ < [-/v\ ] M [ /\ ] M [-/\ ]  
MM [-/\ /\ ] MM [ /\ /\ ] ) > ) >

[2.23b

< ( [-/\ ] = [ < [-/v\ ] M [ /\ ] M [-/\ ]  
Z [-/\ /\ ] Z [ /\ /\ ] ) > ) >



2.27

$\langle \langle [-\Delta] \rangle \equiv \langle \langle [-\Delta] \Delta \rangle M [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle \rangle$

2.28a

$\langle \langle [-\Delta] \rangle \equiv \langle \langle [-\Delta] \Delta \rangle M [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle \rangle$

2.28b

2.28c]

$\langle \langle [-\Delta] \rangle \equiv \langle \langle [-\Delta] \Delta \rangle [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle \rangle$

2.14a

$\langle \langle [-\Delta] \rangle \equiv \langle [-\Delta] \Delta \rangle [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle$

2.14b

$\langle \langle [-\Delta] \rangle \equiv \langle [-\Delta] \Delta \rangle [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle$

2.17

$\langle \langle [-\Delta] \rangle \equiv \langle [-\Delta] \Delta \rangle [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle$

2.24

$\langle \langle [-\Delta] \rangle \equiv \langle [-\Delta] \Delta \rangle [-\Delta] \rangle \rangle$   
 $Z [-\Delta \Delta] Z [\Delta \Delta] \rangle \rangle$

2.29a  
2.29b

[ [ [-\\_ ] [ [-\\_ \\_ ] [-\\_ ] ] ]  
[-\\_ \\_ ] [ \\_ \\_ ] ]

---

Deut.19.2: šālôš 'ārîm tabdîl lāk bêtôk 'arsĕkā 'ăšer YHWH  
'êlôhekā nôtên lĕkā lĕrîstâh

( ( \\_ \\_ ) m ( \\_ \\_ ) m ( \\_ ) MM  
( [ \\_ \\_ ] ≡ [ ( [-\\_ \\_ ] M ( \\_ \\_ ) m ( \\_ ) M ( \\_ \\_ ) > ] ) ) )

2.17

( ( \\_ \\_ ) m ( \\_ \\_ ) m ( \\_ ) MM  
( [ \\_ \\_ ] ≡ [ ( [-\\_ \\_ ] M [ \\_ \\_ ] m [ \\_ ] M [ \\_ \\_ ] > ] ) ) )

2.26a

( ( \\_ \\_ ) m ( \\_ \\_ ) m ( \\_ ) MM  
( [ \\_ \\_ ] ≡ [ ( [-\\_ \\_ ] M [ [ \\_ \\_ ] m [ \\_ ] M [ \\_ \\_ ] ] > ] ) ) )

2.27

( ( \\_ \\_ ) m ( \\_ \\_ ) m ( \\_ ) MM  
( [ \\_ \\_ ] ≡ [ ( [-\\_ \\_ ] M [ [ \\_ \\_ \\_ ] M [ \\_ \\_ ] ] > ] ) ) )

2.28b

2.28c]

( ( \\_ \\_ ) m ( \\_ \\_ ) m ( \\_ ) MM  
( [ \\_ \\_ ] ≡ [ [ [-\\_ \\_ ] [ [ \\_ \\_ \\_ ] [ \\_ \\_ ] ] ] ) ) )

2.17

< [ [ Δ Δ ] m [ /vΔ ] m [ Δ ] MM  
[ [ Δ Δ ] = [ [-Δ Δ ] [ [ /vΔ Δ ] [ /vΔ ] ] ] ] >

2.24

< [ [ Δ Δ ] m [ /vΔ ] m [ Δ ] MM  
[ [ Δ Δ ] [ [-Δ Δ ] [ [ /vΔ Δ ] [ /vΔ ] ] ] ] >

2.25a

< [ [ Δ Δ ] m [ [ /vΔ ] m [ Δ ] ] MM  
[ [ Δ Δ ] [ [-Δ Δ ] [ [ /vΔ Δ ] [ /vΔ ] ] ] ] >

2.27

< [ [ Δ Δ ] m [ [ /vΔ Δ ] ] MM  
[ [ Δ Δ ] [ [-Δ Δ ] [ [ /vΔ Δ ] [ /vΔ ] ] ] ] >

2.29a

2.29b

[ [ Δ Δ ] [ [ /vΔ Δ ] ]  
[ [ Δ Δ ] [ [-Δ Δ ] [ [ /vΔ Δ ] [ /vΔ ] ] ] ]

---

Deut.27.16a: 'ārûr maqleh 'ābîw wě'immô

< ( [ Δ ] ) M: ( ( [ /vΔ ] ) M ( Δ + Δ ) ) ) >

2.12b

< (  $\Delta$  ) M: < ( (  $\Delta$  ) M (  $\Delta$  &  $\Delta$  ) ) >

2.17

< (  $\Delta$  ) M: < ( [  $\Delta$  ] M [  $\Delta$  &  $\Delta$  ] ) >

2.21a

< (  $\Delta$  ) M: < ( [  $\Delta$  ] M [  $\Delta$  ] & [  $\Delta$  ] ) >

2.21b

< (  $\Delta$  ) M: < ( [  $\Delta$  ] M [  $\Delta$  ] M [  $\Delta$  ] ) >

2.27

< (  $\Delta$  ) M: < ( [  $\Delta$  ] M [  $\Delta$  ] ) >

2.28b

2.28c]

< (  $\Delta$  ) M: < [ [  $\Delta$  ] [  $\Delta$  ] [  $\Delta$  ] ] >

2.17

2.29a

2.29b

[ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta$  ] [  $\Delta$  ] ] ]

-----

Deut.32.44: wayyābō' mōšeh waydabbēr 'et kol dibrē  
haššīrah hazzō't bē'oznē hā'am hū' wēhōšē'a bin nūn

< (  $\Delta$  ) M (  $\Delta$  ) > < (  $\Delta$  ) M ( [ -- $\Delta$  ] \* [  $\Delta$  =  $\Delta$  ] )

MM (  $\Delta$  \*  $\Delta$  ) MM ( [  $\Delta$  ] + [  $\Delta$  = - $\Delta$  ] ) >

2.12a

$$\langle (\underline{\Delta} \underline{\Delta}) M (\underline{\Delta}) \rangle \langle (\underline{\Delta} \underline{\Delta}) M ([-\underline{\Delta}] * [\underline{\Delta} \underline{\Delta}]) \rangle \\ MM (\underline{\Delta} \underline{\Delta}) MM ( [\underline{\Delta}] + [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.13b

$$\langle (\underline{\Delta} \underline{\Delta}) M (\underline{\Delta}) \rangle \langle (\underline{\Delta} \underline{\Delta}) M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ MM (\underline{\Delta} \underline{\Delta}) MM ( [\underline{\Delta}] + [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.17

$$\langle [\underline{\Delta} \underline{\Delta}] M [\underline{\Delta}] \rangle \langle [\underline{\Delta} \underline{\Delta}] M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ MM [\underline{\Delta} \underline{\Delta}] MM ( [\underline{\Delta}] + [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.23a

$$\langle [\underline{\Delta} \underline{\Delta}] M [\underline{\Delta}] \rangle \langle [\underline{\Delta} \underline{\Delta}] M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ MM [\underline{\Delta} \underline{\Delta}] Z ( [\underline{\Delta}] + [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.23d

$$\langle [\underline{\Delta} \underline{\Delta}] M [\underline{\Delta}] \rangle \langle [\underline{\Delta} \underline{\Delta}] M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ Z [\underline{\Delta} \underline{\Delta}] Z ( [\underline{\Delta}] + [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.24

$$\langle [\underline{\Delta} \underline{\Delta}] M [\underline{\Delta}] \rangle \langle [\underline{\Delta} \underline{\Delta}] M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ Z [\underline{\Delta} \underline{\Delta}] Z ( [\underline{\Delta}] [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.26b

$$\langle [\underline{\Delta} \underline{\Delta}] M [\underline{\Delta}] \rangle \langle [\underline{\Delta} \underline{\Delta}] M ([-\underline{\Delta}] [\underline{\Delta} \underline{\Delta}]) \rangle \\ Z [\underline{\Delta} \underline{\Delta}] Z ( [\underline{\Delta}] [\underline{\Delta} -\underline{\Delta}] ) \rangle$$

2.27

< [ [ [ √Δ Δ ] ] "M" [ [ [ √Δ ] M [ [ --Δ ] [ Δ Δ ] ] ] ]  
Z [ [ Δ Δ ] Z [ [ Δ ] [ Δ -Δ ] ] ] >

2.29a

2.29b

[ [ [ [ √Δ Δ ] ] [ [ [ √Δ ] [ [ --Δ ] [ Δ Δ ] ] ] ]  
[ Δ Δ ] [ [ Δ ] [ Δ -Δ ] ] ] ]

-----  
II Sam. 3.38: ...kî šar wëgādôl rāpal hayyôm hazzeh  
bēyišrā'ēl

< (-Δ + Δ ) M ( √Δ ) MM ( Δ = Δ ) MM ( Δ ) >

2.12a

2.12b

< (-Δ & Δ ) M ( √Δ ) MM ( Δ Δ ) MM ( Δ ) >

2.16d

2.17

< [-Δ Δ ] M [ [ √Δ ] MM [ Δ Δ ] MM [ Δ ] ] >

2.23a

< [-Δ Δ ] M [ [ √Δ ] MM [ Δ Δ ] Z [ Δ ] ] >

2.26a

< [-Δ Δ ] M [ [ [ √Δ ] MM [ Δ Δ ] ] Z [ Δ ] ] >

2.28a

( [ [-Δ Δ ] M [ [ ΔΔ ] MM [ Δ Δ ] ] ] Z [ Δ ] )

2.28b

2.28c

[ [ [-Δ Δ ] [ [ ΔΔ ] [ Δ Δ ] ] ] Z [ Δ ] ]

I K. 11.1: wēhammelek šēlōmōh 'āhab rāšîm rikriyyôt rabbôt  
wē'et bat par'ōh mō'abiyyôt 'ammōniyyôt 'ādōmiyyôt  
šēdniyyôt hittiyyôt

( (Δ = Δ) M (ΔΔ) M ( [ [ [Δ ≡ Δ] ≡ [Δ] ] + [ - -Δ ] ] )

= [ [ Δ + Δ + Δ ] + [ Δ + Δ ] ] ) )

2.11a

( (Δ = Δ) M (ΔΔ) M ( [ [ [Δ ≡ Δ] ≡ [Δ] ] + [ --Δ ] ] )

= [ [ [ Δ + Δ ] + [ Δ ] ] + [ Δ + Δ ] ] ) )

2.12a

( ( Δ Δ ) M (ΔΔ) M ( [ [ [ Δ Δ ] ≡ [Δ] ] + [ --Δ ] ] )

= [ [ [ Δ + Δ ] + [ Δ ] ] + [ Δ + Δ ] ] ) )

2.12b

( ( Δ Δ ) M (ΔΔ) M ( [ [ [ Δ Δ ] ≡ [Δ] ] + [ --Δ ] ] )

= [ [ [ Δ & Δ ] + [ Δ ] ] + [ Δ & Δ ] ] ) )

2.15a  
2.15b

$$\langle (\Delta \Delta) M (\Delta \Delta) M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ = [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.17

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ = [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.21a

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ = [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.21b

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ Z [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.21a (second time)

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ Z [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.21b (second time)

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ Z [ [\Delta \Delta] + [\Delta] ] + [\Delta \Delta] \rangle \rangle$$

2.24

$$\langle [\Delta \Delta] M [\Delta \Delta] M ( [\Delta \Delta] [\Delta \Delta] + [--\Delta] ) \rangle \\ Z [ [\Delta \Delta] [\Delta \Delta] ] [ [\Delta] ] [ [\Delta \Delta] ] \rangle \rangle$$



2.26a

$$\langle [ \Delta \Delta ] M [ [ \Delta \Delta ] M [ [ \Delta \Delta ] [ \Delta \Delta ] ] ] Z [ -\Delta ]$$

$$Z [ [ [ \Delta \Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] \rangle$$

2.29a

2.29b

$$[ [ \Delta \Delta ] [ [ \Delta \Delta ] [ [ \Delta \Delta ] [ \Delta \Delta ] ] ] [ -\Delta ]$$

$$[ [ [ \Delta \Delta ] [ \Delta \Delta ] ] [ \Delta \Delta ] ] ]$$

-----

Est. 1.5:  $\hat{u}biml\hat{o}'t hayy\hat{a}m\hat{i}m h\hat{a}'\hat{e}l\hat{e}h$   
 $\hat{a}'s\hat{a}h hammelek l\hat{e}k\hat{o}l h\hat{a}'\hat{a}m hannim\hat{s}\hat{e}'\hat{i}m b\hat{e}\hat{s}\hat{u}\hat{s}ar habbir\hat{a}h$   
 $l\hat{e}migg\hat{a}d\hat{o}l w\hat{e}'ad q\hat{a}\hat{t}\hat{a}n m\hat{i}\hat{s}\hat{t}eh \hat{s}ib'at y\hat{a}m\hat{i}m$   
 $bah\hat{s}ar ginnat b\hat{i}tan hammelek$

$$\langle ( [ \Delta ] * [ \Delta = \Delta ] ) MM ( \Delta \Delta ) M ( \Delta ) M$$

$$\langle [ [ -\Delta ] = [ [ \Delta ] @ [ \Delta = \Delta ] ] ] = [ \Delta + -\Delta ] \rangle m$$

$$( \Delta ) MM ( \Delta * \Delta ) MM ( [ \Delta ] * [ [ \Delta * \Delta ] * [ \Delta ] ] ) )$$

2.12a

2.12b

$$\langle ( [ \Delta ] * [ \Delta \Delta ] ) MM ( \Delta \Delta ) M ( \Delta ) M$$

$$\langle [ [ -\Delta ] = [ [ \Delta ] @ [ \Delta \Delta ] ] ] = [ \Delta \& -\Delta ] \rangle m$$

$$( \Delta ) MM ( \Delta \Delta ) MM ( [ \Delta ] * [ [ \Delta \Delta ] * [ \Delta ] ] ) )$$

2.16c

( ( [ Δ ] [ Δ Δ ] ) MM ( √Δ ) M ( Δ ) M  
 ( [ [ -Δ ] = [ [ Δ ] @ [ Δ Δ ] ] ] = [ Δ & -Δ ] ) m  
 ( Δ ) MM ( Δ Δ ) MM ( [ Δ ] [ [ Δ Δ ] [ Δ ] ] ) >

2.17

( [ [ Δ ] [ Δ Δ ] ] MM [ √Δ ] M [ Δ ] M  
 [ [ [ -Δ ] = [ [ Δ ] @ [ Δ Δ ] ] ] = [ Δ & -Δ ] ] m  
 [ Δ ] MM [ Δ Δ ] MM [ [ Δ ] [ [ Δ Δ ] [ Δ ] ] ] >

2.22a

2.22b

( [ [ Δ ] [ Δ Δ ] ] MM [ √Δ ] M [ Δ ] M  
 [ [ [ -Δ ] = [ [ Δ ] @ [ Δ Δ ] ] ] M [ Δ & -Δ ] m  
 [ Δ ] MM [ Δ Δ ] MM [ [ Δ ] [ [ Δ Δ ] [ Δ ] ] ] >

2.23a

( [ [ Δ ] [ Δ Δ ] ] MM [ √Δ ] M [ Δ ] M  
 [ [ [ -Δ ] = [ [ Δ ] @ [ Δ Δ ] ] ] M [ Δ & -Δ ] m  
 [ Δ ] MM [ Δ Δ ] Z [ [ Δ ] [ [ Δ Δ ] [ Δ ] ] ] >

2.23b

( [ [ Δ ] [ Δ Δ ] ] MM [ √Δ ] M [ Δ ] M  
 [ [ [ -Δ ] = [ [ Δ ] @ [ Δ Δ ] ] ] M [ Δ & -Δ ] m  
 [ Δ ] Z [ Δ Δ ] Z [ [ Δ ] [ [ Δ Δ ] [ Δ ] ] ] >

2.24

< [ [ [ Δ ] [ Δ Δ ] ] MM [ √Δ ] M [ Δ ] M  
[ [ -Δ ] [ [ Δ ] [ Δ Δ ] ] ] M [ Δ -Δ ] m  
[ Δ ] Z [ Δ Δ ] Z [ [ Δ ] [ [ Δ Δ ] [ \_Δ ] ] ] >

2.26a

< [ [ [ Δ ] [ Δ Δ ] ] MM [ [ √Δ ] M [ Δ ] M  
[ [ -Δ ] [ [ Δ ] [ Δ Δ ] ] ] M [ Δ -Δ ] m [ Δ ] ]  
Z [ Δ Δ ] Z [ [ Δ ] [ [ Δ Δ ] [ \_Δ ] ] ] >

2.27

< [ [ [ Δ ] [ Δ Δ ] ] M [ [ √Δ Δ ] M  
[ [ -Δ ] [ [ Δ ] [ Δ Δ ] ] ] M [ Δ -Δ ] m [ Δ ] ]  
Z [ Δ Δ ] Z [ [ Δ ] [ [ Δ Δ ] [ \_Δ ] ] ] >

2.29a

2.29b

[ [ [ Δ ] [ Δ Δ ] ]  
[ [ √Δ Δ ] [ [-Δ] [ [Δ] [ Δ Δ ] ] ] [ Δ -Δ ] [ Δ ] ]  
[ Δ Δ ]  
[ [ Δ ] [ [ Δ Δ ] [ \_Δ ] ] ]

APPENDIX C  
 (GENESIS 1.1-13)

Gen. 1.1: bĕrĕ'šît bārā' 'ēlōhîm 'ēt haššamāyîm wĕ'ēt  
 hā'āreš

< ( [ Δ ] \* [ ( ( √Δ ) M ( Δ ) M (-Δ + -Δ ) ) ] ) >

2.12b

< ( [ Δ ] \* [ ( ( √Δ ) M ( Δ ) M (-Δ & -Δ ) ) ] ) >

2.17

< ( [ Δ ] \* [ ( [ √Δ ] M [ Δ ] M [-Δ & -Δ ] ) ] ) >

2.22a n/a

2.23c

< ( [ Δ ] \* [ ( [ √Δ ] M [ Δ ] Z [-Δ & -Δ ] ) ] ) >

2.24

< ( [ Δ ] \* [ ( [ √Δ ] M [ Δ ] Z [-Δ -Δ ] ) ] ) >

2.27

< ( [ Δ ] \* [ ( [ √Δ Δ ] Z [-Δ -Δ ] ) ] ) >

2.28c]

< ( [ Δ ] \* [ [ [ √Δ Δ ] Z [-Δ -Δ ] ] ] ) >

2.13a

< ( [ Δ ] \* [ √Δ Δ ] Z [-Δ -Δ ] ) >

2.13b

< ( [ [ Δ ] [ √Δ Δ ] ] Z [-Δ -Δ ] ) >

2.17

< [ [ [ Δ ] [ √Δ Δ ] ] Z [-Δ -Δ ] ] >

2.29a

2.29b

[ [ [ Δ ] [ √Δ Δ ] ] [-Δ -Δ ] ]

3.

[ Δ ] [ √Δ Δ ] [ -Δ -Δ ]  
d1 d0 d0

4.1

[ Δ ] [ √Δ Δ ] [ ^ Δ ^ Δ ]  
d1 d0 d0

4.2

[ Δ ] [ √Δ Δ ] [ ^ Δ ] [ ^ Δ ]  
d1 d0 d1 d0

6.

[ Δ ] [ √Δ Δ ] [ ^ Δ ] [ ^ Δ ]  
d1. d0 d1. d0

-----  
Gen. 1.2: wēhā'āreṣ hāyētāh tōhû wābōhû  
wēhōšek 'al pēnē tēhōm  
wērūah 'ēlōhîm mēraḥpet 'al pēnē hammāyim

< ( Δ ) M ( √Δ ) M ( Δ + Δ ) >  
< ( Δ ) M: ( - Δ \* Δ ) >  
< ( Δ \* Δ ) M ( √Δ ) MM ( - Δ \* Δ ) >

2.12a

2.12b

< ( Δ ) M ( √Δ ) M ( Δ & Δ ) >  
< ( Δ ) M: ( - Δ Δ ) >  
< ( Δ Δ ) M ( √Δ ) MM ( - Δ Δ ) >

2.17

< [ Δ ] M [ √Δ ] M [ Δ & Δ ] >  
[ Δ ] M: [ -Δ Δ ] >  
< [ Δ Δ ] M [ √Δ ] MM [ -Δ Δ ] >

2.21a

2.21b

< [ Δ ] M [ √Δ ] M [ Δ ] M [ Δ ] >  
< [ Δ ] M: [ -Δ Δ ] >  
< [ Δ Δ ] M [ √Δ ] MM [ -Δ Δ ] >

2.26a

< [ Δ ] M [ [ √Δ ] M [ Δ ] M [ Δ ] ] >

< [ Δ ] M: [ -Δ Δ ] >

< [ Δ Δ ] M [ [ √Δ ] MM [ -Δ Δ ] ] >

2.27

< [ Δ ] M [ [ √Δ Δ ] M [ Δ ] ] >

< [ Δ ] M: [ -Δ Δ ] >

< [ Δ Δ ] M [ [ √Δ ] MM [ -Δ Δ ] ] >

2.29a

2.29b

[ [ Δ ] [ [ √Δ Δ ] [ Δ ] ] ]

[ [ Δ ] [ - Δ Δ ] ]

[ [ Δ Δ ] [ [ √Δ ] [ -Δ Δ ] ] ]

3.

[ Δ ] [ √Δ Δ ] [ Δ ]  
d2 d2 d1

[ Δ ] [ - Δ Δ ]  
d1 d0

[ Δ Δ ] [ √Δ ] [ - Δ Δ ]  
d1 d1 d0

4.1

[ Δ ] [ √Δ Δ ] [ Δ ]  
d2 d2 d1

[ Δ ] [ √ Δ Δ ]  
d1 d0

[ Δ Δ ] [ √Δ ] [ √ Δ Δ ]  
d1 d1 d0

5.

[ Δ Δ ]    [ ΔvΔ Δ Δ ]    [ Δ Δ ]  
           d2                   d2           d1  
 [ Δ Δ ]    [ / \ - Δ Δ Δ Δ ]  
           d1                           d0  
 [ Δ Δ Δ Δ ]    [ ΔvΔ Δ ]    [ / \ - Δ Δ Δ Δ ]  
                   d1                   d1                           d0

6.

[ Δ Δ ]    [ ΔvΔ Δ Δ ]    [ Δ Δ ]  
           d2:                   d2./           d1:  
 [ Δ Δ ]    [ / \ - Δ Δ Δ Δ ]  
           d1.                           d0  
 [ Δ Δ Δ Δ ]    [ ΔvΔ Δ ]    [ / \ - Δ Δ Δ Δ ]  
                   d1:                   d1.                           d0

-----  
 Gen. 1.3: wayyōmer 'ēlōhîm yēhî 'ôr wayhî 'ôr

< ( ΔvΔ ) M ( Δ Δ ) M ( ( ΔvΔ ) M ( Δ Δ ) ) >  
 < ( ΔvΔ ) M ( Δ Δ ) >

2.17

< ( ΔvΔ ) M ( Δ Δ ) M ( [ ΔvΔ ] M [ Δ Δ ] ) >  
 < ( ΔvΔ ) M ( Δ Δ ) >

2.27

< ( ΔvΔ ) M ( Δ Δ ) M ( ΔvΔ Δ ) >  
 < ( ΔvΔ ) M ( Δ Δ ) >



2. 28c]

< ( /v\ ) M ( / \ ) M ( [ /v\ / \ ] ) >

< ( /v\ ) M ( / \ ) >

2. 17

< [ /v\ ] M [ / \ ] M [ /v\ / \ ] >

< [ /v\ ] M [ / \ ] >

2. 27

< [ /v\ / \ ] M [ /v\ / \ ] >

< [ /v\ / \ ] >

2. 29a

2. 29b

[ [ /v\ / \ ] [ /v\ / \ ] ]

[ /v\ / \ ]

3.

[ /v\ / \ ] [ /v\ / \ ]  
          d1                  d0

[ /v\ / \ ]  
          d0

5.

[ /v\ / \ ] [ /v\ - / \ ]  
          d1                  d0

[ /v\ - / \ ]  
          d0

6.

[  $\sqrt{\Delta}$   $\Delta$  ] [  $\sqrt{\Delta}$ - $\Delta$  ]  
d1. d0  
[  $\sqrt{\Delta}$ - $\Delta$  ]  
d0

-----  
Gen. 1.4: wayyar' 'ēlōhîm 'et hā'ôr kî tōb  
wayyabdēl 'ēlōhîm bēn hā'ôr ûbēr haḥōšek

< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  ) M ( < ( - $\Delta$  ) > ) >  
< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  @ - $\Delta$  ) >

2.17

< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  ) M ( < [ - $\Delta$  ] > ) >  
< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  @ - $\Delta$  ) >

2.28c]

< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  ) M ( [ [ - $\Delta$  ] ] ) >  
< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  @ - $\Delta$  ) >

2.12a

< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  ) M ( - $\Delta$  ) >  
< (  $\sqrt{\Delta}$  ) M (  $\Delta$  ) M ( - $\Delta$  - $\Delta$  ) >

2.17

< [  $\sqrt{\Delta}$  ] M [  $\Delta$  ] M [ - $\Delta$  ] M [ - $\Delta$  ] >  
< [  $\sqrt{\Delta}$  ] M [  $\Delta$  ] M [ - $\Delta$  - $\Delta$  ] >

2.23c

$\langle [ \underline{v} \underline{\Delta} ] M [ \underline{\Delta} ] M [ -\underline{\Delta} ] Z [ -\underline{\Delta} ] \rangle$   
 $\langle [ \underline{v} \underline{\Delta} ] M [ \underline{\Delta} ] M [ -\underline{\Delta} -\underline{\Delta} ] \rangle$

2.26b n/a

2.27

$\langle [ \underline{v} \underline{\Delta} \underline{\Delta} ] M [ -\underline{\Delta} ] Z [ -\underline{\Delta} ] \rangle$   
 $\langle [ \underline{v} \underline{\Delta} \underline{\Delta} ] M [ -\underline{\Delta} -\underline{\Delta} ] \rangle$

2.29a

2.29b

$[ [ \underline{v} \underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} ] [ -\underline{\Delta} ] ]$   
 $[ [ \underline{v} \underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} -\underline{\Delta} ] ]$

3.

$[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} ] [ -\underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} -\underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.1

$[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ \wedge \underline{\Delta} ] [ \wedge \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ \wedge \underline{\Delta} \wedge \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.2

$[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ \wedge \underline{\Delta} ] [ \wedge \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{v} \underline{\Delta} \underline{\Delta} ] [ \wedge \underline{\Delta} \wedge \underline{\Delta} ] [ \wedge \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

5.

$[ \begin{smallmatrix} \Delta \vee \Delta \\ \Delta \Delta \end{smallmatrix} ]_{d2}$      $[ \wedge - \Delta ]_{d1}$      $[ \wedge - \Delta ]_{d0}$   
 $[ \begin{smallmatrix} \Delta \vee \Delta \\ \Delta \Delta \end{smallmatrix} ]_{d1}$      $[ \wedge \Delta ]_{d1}$      $[ \wedge \Delta ]_{d\emptyset}$

6.

$[ \begin{smallmatrix} \Delta \vee \Delta \\ \Delta \Delta \end{smallmatrix} ]_{d2./}$      $[ \wedge - \Delta ]_{d1.}$      $[ \wedge - \Delta ]_{d0}$   
 $[ \begin{smallmatrix} \Delta \vee \Delta \\ \Delta \Delta \end{smallmatrix} ]_{d1.}$      $[ \wedge \Delta ]_{d1.}$      $[ \wedge \Delta ]_{d\emptyset}$

---

Gen. 1.5: wayyiqrā' 'ēlōhîm lā'ôn yôm  
 wēlahōsek qārā' lāylāh  
 wayhî 'ereb wayhî bōqer yôm 'eḥād

$\langle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \Delta \rangle M \langle \Delta \vee \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle \rangle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle \rangle \rangle \langle \langle \Delta = \Delta \rangle \rangle \rangle$

2.12a

$\langle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \Delta \rangle M \langle \Delta \vee \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle \rangle \langle \langle \Delta \vee \Delta \rangle M \langle \Delta \rangle \rangle \rangle \langle \langle \Delta \Delta \rangle \rangle \rangle$

2.17

$\langle \langle [ \Delta \vee \Delta ] M [ \Delta ] M [ \Delta ] m [ \Delta ] \rangle \rangle$   
 $\langle [ \Delta ] M [ \Delta \vee \Delta ] m [ \Delta ] \rangle \rangle$   
 $\langle \langle [ \Delta \vee \Delta ] M [ \Delta ] \rangle \langle [ \Delta \vee \Delta ] M [ \Delta ] \rangle \rangle \langle [ \Delta \Delta ] \rangle \rangle$

2.27

( < [ [ \v\ \Delta ] M [ \Delta ] m [ \Delta ] ] >  
 ( [ [ \Delta ] M [ \v\ \Delta ] ] > }  
 { ( < [ [ \v\ \Delta ] ] > < [ [ \v\ \Delta ] ] > } < [ [ \Delta \Delta ] ] > }

2.29a  
2.29b

[ [ [ [ \v\ \Delta ] [ \Delta ] [ \Delta ] ] ]  
 [ [ [ \Delta ] [ \v\ \Delta ] ] ] ]  
 [ [ [ [ [ \v\ \Delta ] ] [ [ \v\ \Delta ] ] ] ] [ [ [ \Delta \Delta ] ] ] ]

3.

[ [ \v\ \Delta ] [ \Delta ] [ \Delta ] ]  
           d3          d2          d1  
 [ [ \Delta ] [ [ \v\ \Delta ] ] ]  
           d1          d0  
 [ [ \v\ \Delta ] [ [ \v\ \Delta ] ] [ [ \Delta \Delta ] ] ]  
           d2          d1          d0

4.3a

[ [ \v\ \Delta ] [ \Delta ] [ \Delta ] ] [ [ \Delta ] ]  
           d2          d1  
 [ [ \Delta ] [ [ \v\ \Delta ] ] ]  
           d1          d0  
 [ [ \v\ \Delta ] [ \v\ \Delta ] [ [ \Delta \Delta ] ] ]  
           d1          d0

5.

[ [ \v\ \Delta ] [ \Delta ] [ \Delta ] ] [ [ \Delta ] ]  
           d2          d1  
 [ [ \Delta ] [ [ \v\ \Delta ] ] ]  
           d1          d0  
 [ [ \v\ \Delta - \Delta ] [ \v\ \Delta - \Delta ] ] [ [ \Delta \Delta ] ]  
           d1          d0

6.

[ /v\ \ \ ] [ \ \ ]  
                  d2./s     d1s  
[ \ \ ] [ /v\ \ \ ]  
          d1.           d0  
[ /v\-\ \ \ \ /v\-\ \ \ ] [ \ \ \ \ ]  
                                  d1.           d0

-----

Gen. 1.6: wayyōmer 'ēlōhîm  
yēhî rāqîa' bêtōk hammāyîm  
wîhî mabdîl bēn mayim lāmāyim

< ( /v\ ) M ( \ \ ) M  
< [ < ( /v\ ) M ( \ \ ) M ( \ \ \* \ \ ) > ] +  
[ ( (-/v\ ) M (-\ \ @ \ \ ) > ] ) )

2.12a

< ( /v\ ) M ( \ \ ) M  
< [ < ( /v\ ) M ( \ \ ) M ( \ \ \ \ ) > ] +  
[ < (-/v\ ) M (-\ \ \ \ ) > ] ) )

2.17

< ( /v\ ) M ( \ \ ) M  
< [ < [ /v\ ] M [ \ \ ] M [ \ \ \ \ ] > ] +  
[ < [-/v\ ] M [-\ \ \ \ ] > ] ) )

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2.27

$$\begin{aligned} & \langle ( \underline{v} ) M ( \underline{\Delta} ) M \\ & \langle [ \langle [ \underline{v} \underline{\Delta} ] M [ \underline{\Delta} \underline{\Delta} ] \rangle ] + \\ & [ \langle [ -\underline{v} ] M [ -\underline{\Delta} \underline{\Delta} ] \rangle ] \rangle \end{aligned}$$

2.28a

2.28b]

$$\begin{aligned} & \langle ( \underline{v} ) M ( \underline{\Delta} ) M \\ & \langle [ [ [ \underline{v} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] ] + \\ & [ [ [ -\underline{v} ] [ -\underline{\Delta} \underline{\Delta} ] ] ] \rangle \end{aligned}$$

2.17

$$\begin{aligned} & \langle [ \underline{v} ] M [ \underline{\Delta} ] M \\ & [ [ [ \underline{v} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] + \\ & [ [ -\underline{v} ] [ -\underline{\Delta} \underline{\Delta} ] ] \rangle \end{aligned}$$

2.22a

2.22b

$$\begin{aligned} & \langle [ \underline{v} ] M [ \underline{\Delta} ] M \\ & [ [ \underline{v} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] M \\ & [ [ -\underline{v} ] [ -\underline{\Delta} \underline{\Delta} ] ] \rangle \end{aligned}$$

2.23c

$$\begin{aligned} & \langle [ \underline{v} ] M [ \underline{\Delta} ] M \\ & [ [ \underline{v} \underline{\Delta} ] [ \underline{\Delta} \underline{\Delta} ] ] Z \\ & [ [ -\underline{v} ] [ -\underline{\Delta} \underline{\Delta} ] ] \rangle \end{aligned}$$

2.27

$\langle [ \underline{\vee} \underline{\Delta} ] \ M \ [ [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ] ] \ Z$   
 $[ [ -\underline{\vee} ] \ [ -\underline{\Delta} \underline{\Delta} ] ] \rangle$

2.29a

2.29b

$[ [ \underline{\vee} \underline{\Delta} ] \ [ [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ] ] ]$   
 $[ [ -\underline{\vee} ] \ [ -\underline{\Delta} \underline{\Delta} ] ] ]$

3.

$[ \underline{\vee} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ -\underline{\vee} ] \quad [ -\underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.1

$[ \underline{\vee} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \wedge \underline{\vee} ] \quad [ \wedge \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.2

$[ \underline{\vee} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \wedge \underline{\vee} ] \quad [ \wedge \underline{\Delta} ] \ [ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

6.

$[ \underline{\vee} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} ] \ [ \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \wedge \underline{\vee} ] \quad [ \wedge \underline{\Delta} ] \ [ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$



-----

Gen. 1.7: wayya'as 'elohim 'et haraqa'  
wayyabdēl bēn hammayim 'āser mittahat lāraqia'  
ûbēn hammayim 'āser mē'al lāraqia'  
wayhî kēn

( ( ( √ ) M ( ) M ( - ) ) )  
( ( √ ) M ( [ [ - ] ≡ [ ( - @ ) ] ] )  
@ [ [ - ] ≡ [ ( - @ ) ] ] ) ) ) }  
( ( √ ) M ( ) )

2.12a

( ( ( √ ) M ( ) M ( - ) ) )  
( ( √ ) M ( [ [ - ] ≡ [ ( - ) ] ] )  
@ [ [ - ] ≡ [ ( - ) ] ] ) ) ) }  
( ( √ ) M ( ) )

2.17

( ( ( √ ) M ( ) M ( - ) ) )  
( ( √ ) M ( [ [ - ] ≡ [ [ - ] ] ] )  
@ [ [ - ] ≡ [ [ - ] ] ] ) ) ) }  
( ( √ ) M ( ) )

2.29a]

( ( ( √ ) M ( ) M ( - ) ) )  
( ( √ ) M ( [ [ - ] ≡ [ [ [ - ] ] ] ] )  
@ [ [ - ] ≡ [ [ [ - ] ] ] ] ) ) ) }  
( ( √ ) M ( ) )

2.14b  
2.15b

( ( (  $\Delta$  ) M (  $\Delta$  ) M ( - $\Delta$  ) )  
( (  $\Delta$  ) M ( [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ]  
@ [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ] ) ) }  
( (  $\Delta$  ) M (  $\Delta$  ) )

2.17

( ( [  $\Delta$  ] M [  $\Delta$  ] M [ - $\Delta$  ] )  
( [  $\Delta$  ] M [ [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ]  
@ [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ] ) ) }  
( [  $\Delta$  ] M [  $\Delta$  ] )

2.21a  
2.21b

( ( [  $\Delta$  ] M [  $\Delta$  ] M [ - $\Delta$  ] )  
( [  $\Delta$  ] M [ [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ]  
M [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ] ) ) }  
( [  $\Delta$  ] M [  $\Delta$  ] )

2.27

( ( [  $\Delta$  ] M [ - $\Delta$  ] )  
( [  $\Delta$  ] M [ [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ]  
M [ [ - $\Delta$  ] [ - $\Delta$   $\Delta$  ] ] ) ) }  
( [  $\Delta$  ] )

2.29a

{ < [  $\Delta$   $\Delta$  ] [  $-\Delta$  ] >  
< [  $\Delta$  ] [ [  $-\Delta$  ] [  $-\Delta$   $\Delta$  ] ]  
[ [  $-\Delta$  ] [  $-\Delta$   $\Delta$  ] ] > }  
< [  $\Delta$   $\Delta$  ] >

2.29b

[ [ [  $\Delta$   $\Delta$  ] [  $-\Delta$  ] ]  
[ [  $\Delta$  ] [ [  $-\Delta$  ] [  $-\Delta$   $\Delta$  ] ]  
[ [  $-\Delta$  ] [  $-\Delta$   $\Delta$  ] ] ] ]  
[ [  $\Delta$   $\Delta$  ] ]

3.

[  $\Delta$   $\Delta$  ] [  $-\Delta$  ]  
          d2          d1  
[  $\Delta$  ] [  $-\Delta$  ] [  $-\Delta$   $\Delta$  ]  
          d2          d2          d1  
[  $-\Delta$  ] [  $-\Delta$   $\Delta$  ]  
          d1          d0  
[  $\Delta$   $\Delta$  ]  
          d0

4.1

[  $\Delta$   $\Delta$  ] [  $\Delta$  ]  
          d2          d1  
[  $\Delta$  ] [  $\Delta$  ] [  $\Delta$   $\Delta$  ]  
          d2          d2          d1  
[  $\Delta$  ] [  $\Delta$  ]  
          d1          d0  
[  $\Delta$   $\Delta$  ]  
          d0

4.2

[ \v\ \ ] [ \ \ ]  
           d2                  d1  
 [ \v\ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d2                  d2                  d2                  d1  
 [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d1                  d1                  d0  
 [ \v\ \ ]  
           d0

5.

[ \v\ \ ] [ \-\ ]  
           d2                  d1  
 [ \v\ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d2                  d2                  d2                  d1  
 [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d1                  d1                  d0  
 [ \v\-\ ]  
           d0

6.

[ \v\ \ ] [ \-\ ]  
           d2./s.                  d1s.  
 [ \v\ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d2s.                  d2./s.                  d2./s.                  d1s.  
 [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d1s.                  d1.                  d0  
 [ \v\-\ ]  
           d0

---

Gen. 1.8: wayyiqrā' 'ēlōhîm lārāqîa' sāmāyim  
 wayhî 'ereb wayhî bōqer yôm sēni

See Gen. 1.5

-----

Gen. 1.9: wayyōmer 'ēlōhîm  
 yiqqāwû hammayim mittahat haššāmayim  
 'el māqôm 'ehād  
 wētēra'eh hayyabbāsāh  
 wayhî kēn

< ( /v\ ) M ( / \ ) M  
 [ [ < ( /v\ ) M ( / \ ) MM ( / \ \* / \ ) MM ( -/ \ = / \ ) ] ] +  
 [ < ( /v\ ) M ( / \ ) ] ) )  
 < ( /v\ ) MM ( / \ ) )

2.12a

< ( /v\ ) M ( / \ ) M  
 [ [ < ( /v\ ) M ( / \ ) MM ( / \ / \ ) MM ( -/ \ / \ ) ] ] +  
 [ < ( /v\ ) M ( / \ ) ] ) )  
 < ( /v\ ) MM ( / \ ) )

2.17

< ( /v\ ) M ( / \ ) M  
 [ [ [ < [ /v\ ] M [ / \ ] MM [ / \ / \ ] MM [ -/ \ / \ ] ] ] ] +  
 [ [ [ /v\ ] M [ / \ ] ] ] ) )  
 < ( /v\ ) MM ( / \ ) )

2.23a

< ( /v\ ) M ( / \ ) M  
 [ [ [ [ /v\ ] M [ / \ ] MM [ / \ / \ ] ] ] ] +  
 [ [ [ /v\ ] M [ / \ ] ] ] ) )  
 < ( /v\ ) MM ( / \ ) )

2.27

( (  $\Delta v \Delta$  ) M (  $\Delta$  ) M  
( [ ( [  $\Delta v \Delta$   $\Delta$  ] MM [  $\Delta$   $\Delta$  ] ] Z [ - $\Delta$   $\Delta$  ] ) ] +  
[ ( [  $\Delta v \Delta$   $\Delta$  ] ) ] ) )  
( (  $\Delta v \Delta$  ) MM (  $\Delta$  ) )

2.28a

2.28b

( (  $\Delta v \Delta$  ) M (  $\Delta$  ) M  
( [ ( [ [  $\Delta v \Delta$   $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ] Z [ - $\Delta$   $\Delta$  ] ) ] ) +  
[ ( [  $\Delta v \Delta$   $\Delta$  ] ) ] ) )  
( (  $\Delta v \Delta$  ) MM (  $\Delta$  ) )

2.28c]

( (  $\Delta v \Delta$  ) M (  $\Delta$  ) M  
( [ [ [ [  $\Delta v \Delta$   $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ] ] Z [ - $\Delta$   $\Delta$  ] ] ] ) +  
[ [ [  $\Delta v \Delta$   $\Delta$  ] ] ] ) )  
( (  $\Delta v \Delta$  ) MM (  $\Delta$  ) )

2.17

( [  $\Delta v \Delta$  ] M [  $\Delta$  ] M  
[ [ [ [  $\Delta v \Delta$   $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ] Z [ - $\Delta$   $\Delta$  ] ] +  
[  $\Delta v \Delta$   $\Delta$  ] ] )  
( [  $\Delta v \Delta$  ] MM [  $\Delta$  ] )

2.22a  
 2.22b  
 no repeat

< [ /v\ ] M [ \\_ ] M  
 [ [ [ /v\ \\_ ] [ \\_ \\_ ] ] Z [ -\\_ \\_ ] ] Z  
 [ /v\ \\_ ] >  
 < [ /v\ ] MM [ \\_ ] >

2.27

< [ /v\ \\_ ] M  
 [ [ [ /v\ \\_ ] [ \\_ \\_ ] ] Z [ -\\_ \\_ ] ] Z  
 [ /v\ \\_ ] >  
 < [ /v\ ] MM [ \\_ ] >

2.29a  
 2.29b

[ [ /v\ \\_ ]  
 [ [ [ /v\ \\_ ] [ \\_ \\_ ] ] [ -\\_ \\_ ] ]  
 [ /v\ \\_ ] ]  
 [ [ /v\ ] [ \\_ ] ]

3.

[ \\_ \\_ ]      [ \\_ \\_ ] [ \\_ \\_ ] [ -\\_ \\_ ]      [ \\_ \\_ ]  
                   **d2**                    **d3**                    **d2**                    **d1**                    **d0**  
 [ \\_ \\_ ]  
                   **d0**

4.1

[ Δ Δ Δ ] [ Δ Δ Δ ] [ Δ Δ Δ ] [ \ Δ Δ Δ ] [ Δ Δ Δ ]  
                   d2                  d3                  d2                  d1                  d0  
 [ Δ Δ Δ ]  
                   d0

4.2

[ Δ Δ Δ ] [ Δ Δ Δ ] [ Δ Δ Δ ] [ \ Δ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
                   d2                  d3                  d2                  d1                  d1                  d0  
 [ Δ Δ Δ ]  
                   d0

5.

[ Δ Δ Δ ] [ Δ Δ Δ ] [ Δ Δ Δ ] [ \-Δ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
                   d2                  d3                  d2                  d1                  d1                  d0  
 [ Δ Δ-Δ Δ ]  
                   d0

6.

[ Δ Δ Δ ] [ Δ Δ Δ ] [ Δ Δ Δ ] [ \-Δ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
                   d2s                  d3s                  d2./s                  d1s                  d1.                  d0  
 [ Δ Δ-Δ Δ ]  
                   d0

---

Gen. 1.10: wayyiqrā' 'ēlōhîm layyabbāsāh 'eres  
 ûlēmīqwēh hammayim qārā' yammîm  
 wayar' 'ēlōhîm kî tōb

{ ( ( Δv ) M ( Δ ) M ( Δ ) m ( Δ ) )  
 ( ( Δ \* Δ ) M ( Δv ) m ( Δ ) ) }  
 ( ( Δv ) M ( Δ ) M ( ( -Δ ) ) )



2.17  
2.28c]

$\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta * \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle \langle -\Delta \rangle \rangle \rangle \rangle$

2.12a

$\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle -\Delta \rangle \rangle \rangle$

2.17

$\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle -\Delta \rangle \rangle \rangle$

2.26a

$\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \Delta \rangle M \langle \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \rangle M \langle \Delta \rangle M \langle -\Delta \rangle \rangle \rangle$

2.27

$\langle \langle \langle \Delta \Delta \rangle M \langle \Delta \rangle m \langle \Delta \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \Delta \rangle M \langle \langle \Delta \Delta \rangle \rangle \rangle \rangle$   
 $\langle \langle \langle \Delta \Delta \rangle M \langle -\Delta \rangle \rangle \rangle$

2.29a  
2.29b

[ [ [ \V \ \ ] [ \ ] [ \ ] ] ]  
 [ [ \ \ ] [ \V \ \ ] ] ]  
 [ [ \V \ \ ] [ - \ ] ] ]

3.

[ \ \ ] [ \ ] [ \ ]  
           **d3**          **d2**          **d1**  
 [ \ \ ] [ \ \ ]  
           **d1**          **d0**  
 [ \ \ ] [ - \ ]  
           **d1**          **d0**

4.1

[ \ \ ] [ \ ] [ \ ]  
           **d3**          **d2**          **d1**  
 [ \ \ ] [ \ \ ]  
           **d1**          **d0**  
 [ \ \ ] [ \ \ ]  
           **d1**          **d0**

4.3a

[ \ \ \ ] [ \ ]  
           **d2**          **d1**  
 [ \ \ ] [ \ \ ]  
           **d1**          **d0**  
 [ \ \ ] [ \ \ ]  
           **d1**          **d0**

5.

6.

[ \ \ \ ] [ \ ]  
           **d2. / s**          **d1 s**  
 [ \ \ ] [ \ \ ]  
           **d1.**          **d0**  
 [ \ \ ] [ \ - \ ]  
           **d1.**          **d0**

-----

Gen. 1.11: wayyōmer 'ēlōnîm  
 tadšē' hā'āreš dešē' 'ēšeb mazrîa' zera'  
 'ēš pērî 'ōbeh pērî lēmînô  
 'āser zar'ô bô 'al hā'āreš  
 wayhî kērî

< ( ( √Δ ) M ( Δ ) M  
 ( ( ( √Δ ) M ( Δ ) M  
 ( [ [ Δ ] \* [ [ Δ ] ] ≡ [ < ( ( √Δ ) m ( Δ ) ) ] ] ] +  
 [ [ [ [ Δ \* Δ ] ] = [ < ( ( √Δ ) m ( Δ ) ) ] ] @ [ Δ ] ] =  
 [ < ( -Δ ) m: ( Δ ) MM ( -Δ ) ) ] ] ) ) ) )  
 < ( ( √Δ ) M ( Δ ) ) )

[[2.17  
 2.27  
 2.28c

< ( ( √Δ ) M ( Δ ) M  
 ( ( ( √Δ ) M ( Δ ) M  
 ( [ [ Δ ] \* [ [ Δ ] ] ≡ [ < [ √Δ Δ ] > ] ] ] +  
 [ [ [ [ Δ \* Δ ] ] = [ < [ √Δ Δ ] > ] ] @ [ Δ ] ] =  
 [ < [ -Δ Δ ] [ -Δ ] > ] ] ) ) ) ) ) )  
 < ( ( √Δ ) M ( Δ ) ) )

2.28c]

$$\begin{aligned} & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle ( ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] ] = [ [ \underline{\Delta v} \underline{\Delta} ] ] ] ] + \\ & [ [ [ [ \underline{\Delta} * \underline{\Delta} ] ] = [ [ \underline{\Delta v} \underline{\Delta} ] ] ] @ [ \underline{\Delta} ] ] = \\ & \quad [ [ [ -\underline{\Delta} \underline{\Delta} ] \quad [ -\underline{\Delta} ] ] ] ) ) ) \\ & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) \rangle \end{aligned}$$

2.12a

$$\begin{aligned} & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle ( ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] ] = [ \underline{\Delta v} \underline{\Delta} ] ] ] + \\ & [ [ [ [ \underline{\Delta} \underline{\Delta} ] ] = [ \underline{\Delta v} \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] = \\ & \quad [ [ -\underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} ] ] ) ) ) \\ & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) \rangle \end{aligned}$$

2.14b n/n 2.16b

2.16c

$$\begin{aligned} & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle ( ( \underline{\Delta v} ) M ( \underline{\Delta} ) M \\ & \langle [ [ \underline{\Delta} ] \quad [ [ \underline{\Delta} ] \quad [ \underline{\Delta v} \underline{\Delta} ] ] ] + \\ & [ [ [ [ \underline{\Delta} \underline{\Delta} ] ] = [ \underline{\Delta v} \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] = \\ & \quad [ [ -\underline{\Delta} \underline{\Delta} ] [ -\underline{\Delta} ] ] ) ) ) \\ & \langle ( \underline{\Delta v} ) M ( \underline{\Delta} ) \rangle \end{aligned}$$

2.17

( ( /v\ ) M ( \ / ) M  
 ( ( [ /v\ ] M [ \ / ] M  
 [ [ [ \ / ] [ [ \ / ] [ /v\ \ / ] ] ] +  
 [ [ [ [ \ / \ / ] = [ /v\ \ / ] ] @ [ \ / ] ] =  
 [ [-\ / \ / ] [-\ / ] ] ] > ) ) )  
 ( ( /v\ ) M ( \ / ) )

2.22a

2.22b

( ( /v\ ) M ( \ / ) M  
 ( ( [ /v\ ] M [ \ / ] M  
 [ [ \ / ] [ [ \ / ] [ /v\ \ / ] ] ] M  
 [ [ [ [ \ / \ / ] = [ /v\ \ / ] ] @ [ \ / ] ] =  
 [ [-\ / \ / ] [-\ / ] ] ] > ) ) )  
 ( ( /v\ ) M ( \ / ) )

2.23b

( ( /v\ ) M ( \ / ) M  
 ( ( [ /v\ ] M [ \ / ] M  
 [ [ \ / ] [ [ \ / ] [ /v\ \ / ] ] ] Z  
 [ [ [ [ \ / \ / ] = [ /v\ \ / ] ] @ [ \ / ] ] =  
 [ [-\ / \ / ] [-\ / ] ] ] > ) ) )  
 ( ( /v\ ) M ( \ / ) )

2.24

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( ( [  $\Delta v$  ] M [  $\Delta$  ] M  
[ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] ] Z  
[ [ [ [  $\Delta$   $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] [  $\Delta$  ] ]  
[ [ - $\Delta$   $\Delta$  ] [ - $\Delta$  ] ] ] > ) >  
( (  $\Delta v$  ) M (  $\Delta$  ) )

2.27

2.28a

2.28b

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( ( [ [  $\Delta v$   $\Delta$  ] [ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] ] ] Z  
[ [ [ [  $\Delta$   $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] [  $\Delta$  ] ]  
[ [ - $\Delta$   $\Delta$  ] [ - $\Delta$  ] ] ] > ) >  
( (  $\Delta v$  ) M (  $\Delta$  ) )

2.28c]

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( [ [ [  $\Delta v$   $\Delta$  ] [ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] ] ] Z  
[ [ [ [  $\Delta$   $\Delta$  ] [  $\Delta v$   $\Delta$  ] ] [  $\Delta$  ] ]  
[ [ - $\Delta$   $\Delta$  ] [ - $\Delta$  ] ] ] > ) >  
( (  $\Delta v$  ) M (  $\Delta$  ) )

2.17

< [ √Δ ] M [ Δ ] M  
 [ [ [ [ √Δ Δ ] [ [ Δ ] [ [ Δ ] [ √Δ Δ ] ] ] ] Z  
 [ [ [ [ Δ Δ ] [ √Δ Δ ] ] [ Δ ] ]  
     [ [-Δ Δ ] [-Δ ] ] ] ] >  
 < [ √Δ ] M [ Δ ] >

2.22a

2.22b

< [ √Δ ] M [ Δ ] M  
 [ [ [ [ √Δ Δ ] [ [ Δ ] [ [ Δ ] [ √Δ Δ ] ] ] ] Z  
 [ [ [ [ Δ Δ ] [ √Δ Δ ] ] [ Δ ] ]  
     [ [-Δ Δ ] [-Δ ] ] ] ] >  
 < [ √Δ ] M [ Δ ] >

2.27

2.29a

< [ √Δ Δ ]  
 [ [ [ [ √Δ Δ ] [ [ Δ ] [ [ Δ ] [ √Δ Δ ] ] ] ]  
 [ [ [ [ Δ Δ ] [ √Δ Δ ] ] [ Δ ] ]  
     [ [-Δ Δ ] [-Δ ] ] ] ] >  
 < [ √Δ Δ ] >

2.29b

[ [ \v\ \ ] ]  
 [ [ [ \v\ \ ] [ [ \ ] [ [ \ ] [ \v\ \ ] ] ] ] ]  
 [ [ [ [ \ \ ] [ \v\ \ ] ] [ \ ] ] ]  
 [ [ -\ \ ] [ -\ ] ] ] ] ]  
 [ [ \v\ \ ] ] ]

3.

[ \ \ ]  
           d2  
 [ \ \ ] [ \ ] [ \ ] [ \ \ ]  
           d2          d2          d1  
 [ \ \ ] [ \ \ ] [ \ \ ] [ -\ \ ] [ -\ \ ]  
           d3          d2          d1          d1          d0  
 [ \ \ ]  
           d0

4.1

[ \ \ ]  
           d2  
 [ \ \ ] [ \ ] [ \ ] [ \ \ ]  
           d2          d2          d1  
 [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d3          d2          d1          d1          d1          d0  
 [ \ \ ]  
           d0

5.

6.

[ \ \ ]  
           d2;  
 [ \ \ ] [ \ ] [ \ ] [ \ \ ]  
           d2./;          d2;;          d2./;          d1;  
 [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ] [ \ \ ]  
           d3;          d2./;          d1;          d1.          d0  
 [ \ \ ]  
           d0



-----

Gen. 1.12: wattôšē' hā'āreš dešē' 'ēšeb mazrîa' zera'  
lēmînēhû  
wē'ēš 'ōšeh pērî 'āšer zar'ô bô lēmînēhû  
wayyar' 'ēlōhîm kî ṭôb

< ( /v\ ) M ( \ / ) M

< [ [ [ \ / ] \* [ [ \ / ] ≡ [ < ( /v\ ) m ( \ / ) > ] ] ]  
@ [ \ / ] ] +

[ [ [ \ / ] ≡ [ < ( /v\ ) M ( [ \ / ] ≡ [ < ( - \ / ) m : ( \ / ) > ] ) > ] ] ]  
@ [ \ / ] ] ) )

< ( /v\ ) M ( \ / ) M ( < ( - \ / ) > ) ) )

[[2.17  
2.27  
2.28b  
2.28c]

< ( /v\ ) M ( \ / ) M

< [ [ [ \ / ] \* [ [ \ / ] ≡ [ < ( /v\ ) m ( \ / ) > ] ] ]  
@ [ \ / ] ] +

[ [ [ \ / ] ≡ [ < ( /v\ ) M ( [ \ / ] ≡ [ [ [ - \ / : \ / ] ] ) > ] ] ]  
@ [ \ / ] ] ) )

< ( /v\ ) M ( \ / ) M ( < ( - \ / ) > ) ) )

2.14b

$$\begin{aligned}
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M \\
& \langle [ [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle m (\underline{\Delta}) \rangle ] ] ] \\
& \quad @ [ \underline{\Delta} ] ] + \\
& [ [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle M [ [ \underline{\Delta} ] \equiv [ -\underline{\Delta} : \underline{\Delta} ] ] \rangle ] ] \\
& \quad @ [ \underline{\Delta} ] ] \rangle \\
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M (\langle (-\underline{\Delta}) \rangle \rangle \rangle
\end{aligned}$$

2.17

$$\begin{aligned}
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M \\
& \langle [ [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle m [ \underline{\Delta} ] \rangle ] ] ] \\
& \quad @ [ \underline{\Delta} ] ] + \\
& [ [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle M [ [ \underline{\Delta} ] \equiv [ -\underline{\Delta} : \underline{\Delta} ] ] ] \rangle ] ] \\
& \quad @ [ \underline{\Delta} ] ] \rangle \\
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M (\langle [-\underline{\Delta}] \rangle \rangle \rangle
\end{aligned}$$

2.21a

2.21b

$$\begin{aligned}
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M \\
& \langle [ [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle m [ \underline{\Delta} ] \rangle ] ] ] \\
& \quad @ [ \underline{\Delta} ] ] + \\
& [ [ [ \underline{\Delta} ] \equiv [ \langle (\underline{v}) \rangle M [ \underline{\Delta} ] M [ -\underline{\Delta} : \underline{\Delta} ] \rangle ] ] \\
& \quad @ [ \underline{\Delta} ] ] \rangle \\
& \langle (\underline{v}) \rangle M (\underline{\Delta}) M (\langle [-\underline{\Delta}] \rangle \rangle \rangle
\end{aligned}$$

2.23c

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( [ [ [  $\Delta$  ] \* [ [  $\Delta$  ]  $\equiv$  [ ( [  $\Delta v$  ] m [  $\Delta$  ] ) ] ] ]  
    @ [  $\Delta$  ] ] +  
[ [ [  $\Delta$  ]  $\equiv$  [ ( [  $\Delta v$  ] M [  $\Delta$  ] Z [ - $\Delta$  :  $\Delta$  ] ) ] ] ]  
    @ [  $\Delta$  ] ] ) )  
( (  $\Delta v$  ) M (  $\Delta$  ) M ( ( [ - $\Delta$  ] ) ) )

2.27

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( [ [ [  $\Delta$  ] \* [ [  $\Delta$  ]  $\equiv$  [ ( [  $\Delta v$   $\Delta$  ] ) ] ] ] ]  
    @ [  $\Delta$  ] ] +  
[ [ [  $\Delta$  ]  $\equiv$  [ ( [  $\Delta v$   $\Delta$  ] Z [ - $\Delta$  :  $\Delta$  ] ) ] ] ] @ [  $\Delta$  ] ] ) )  
( (  $\Delta v$  ) M (  $\Delta$  ) M ( ( [ - $\Delta$  ] ) ) )

2.28a n/n

2.28b n/n

2.28c]

( (  $\Delta v$  ) M (  $\Delta$  ) M  
( [ [ [  $\Delta$  ] \* [ [  $\Delta$  ]  $\equiv$  [ [ [  $\Delta v$   $\Delta$  ] ] ] ] ] @  
    [  $\Delta$  ] ] +  
[ [ [  $\Delta$  ]  $\equiv$  [ [ [  $\Delta v$   $\Delta$  ] Z [ - $\Delta$  :  $\Delta$  ] ] ] ] @ [  $\Delta$  ] ] ) )  
( (  $\Delta v$  ) M (  $\Delta$  ) M ( [ [ - $\Delta$  ] ] ) )

2.14a

$$\begin{aligned} & \langle (\underline{v}) M (\underline{\Delta}) M \\ & \langle [ [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] = [ \underline{v} \underline{\Delta} ] ] ] @ [ \underline{\Delta} ] ] + \\ & [ [ [ \underline{\Delta} ] = [ \underline{v} \underline{\Delta} ] ] Z [ -\underline{\Delta} : \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] \rangle \\ & \langle (\underline{v}) M (\underline{\Delta}) M (-\underline{\Delta}) \rangle \end{aligned}$$

2.14b

$$\begin{aligned} & \langle (\underline{v}) M (\underline{\Delta}) M \\ & \langle [ [ [ \underline{\Delta} ] * [ [ \underline{\Delta} ] = [ \underline{v} \underline{\Delta} ] ] ] @ [ \underline{\Delta} ] ] + \\ & [ [ [ \underline{\Delta} ] = [ \underline{v} \underline{\Delta} ] ] Z [ -\underline{\Delta} : \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] \rangle \\ & \langle (\underline{v}) M (\underline{\Delta}) M (-\underline{\Delta}) \rangle \end{aligned}$$

2.15b

2.15c

$$\begin{aligned} & \langle (\underline{v}) M (\underline{\Delta}) M \\ & \langle [ [ [ \underline{\Delta} ] [ [ \underline{\Delta} ] [ \underline{v} \underline{\Delta} ] ] ] @ [ \underline{\Delta} ] ] + \\ & [ [ [ \underline{\Delta} ] [ \underline{v} \underline{\Delta} ] ] Z [ -\underline{\Delta} : \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] \rangle \\ & \langle (\underline{v}) M (\underline{\Delta}) M (-\underline{\Delta}) \rangle \end{aligned}$$

2.17

$$\begin{aligned} & \langle [ \underline{v} ] M [ \underline{\Delta} ] M \\ & [ [ [ [ \underline{\Delta} ] [ [ \underline{\Delta} ] [ \underline{v} \underline{\Delta} ] ] ] @ [ \underline{\Delta} ] ] + \\ & [ [ [ [ \underline{\Delta} ] [ \underline{v} \underline{\Delta} ] ] Z [ -\underline{\Delta} : \underline{\Delta} ] ] @ [ \underline{\Delta} ] ] ] \rangle \\ & \langle [ \underline{v} ] M [ \underline{\Delta} ] M [ -\underline{\Delta} ] \rangle \end{aligned}$$

2.22a  
2.22b

< [ /v\ ] M [ /\ ] M  
[ [ /\ ] [ [ /\ ] [ /v\ /\ ] ] ] @@ [ /\ ] ] M  
[ [ [ /\ ] [ /v\ /\ ] ] Z [ -/\ : /\ ] ] @@ [ /\ ] ] >  
< [ /v\ ] M [ /\ ] M [ -/\ ] >

2.22a repeat  
2.22b repeat

< [ /v\ ] M [ /\ ] M  
[ [ /\ ] [ [ /\ ] [ /v\ /\ ] ] ] M [ /\ ] M  
[ [ [ /\ ] [ /v\ /\ ] ] Z [ -/\ : /\ ] ] @@ [ /\ ] ] >  
< [ /v\ ] M [ /\ ] M [ -/\ ] >

2.23b

< [ /v\ ] M [ /\ ] M  
[ [ /\ ] [ [ /\ ] [ /v\ /\ ] ] ] M [ /\ ] Z  
[ [ [ /\ ] [ /v\ /\ ] ] Z [ -/\ : /\ ] ] @@ [ /\ ] ] >  
< [ /v\ ] M [ /\ ] M [ -/\ ] >

2.24

< [ /v\ ] M [ /\ ] M  
[ [ /\ ] [ [ /\ ] [ /v\ /\ ] ] ] M [ /\ ] Z  
[ [ [ /\ ] [ /v\ /\ ] ] Z [ -/\ : /\ ] ] [ /\ ] ] >  
< [ /v\ ] M [ /\ ] M [ -/\ ] >

2.27

< [ [ \v\ \ ] M  
 [ [ \ ] [ [ \ ] [ \v\ \ ] ] ] M [ \ ] Z  
 [ [ [ [ \ ] [ \v\ \ ] ] ] Z [ -\ : \ ] ] [ \ ] ] >  
 < [ [ \v\ \ ] M [ -\ ] ] >

2.29a

2.29b

[ [ \v\ \ ]  
 [ [ \ ] [ [ \ ] [ \v\ \ ] ] ] [ \ ]  
 [ [ [ [ \ ] [ \v\ \ ] ] ] [ -\ : \ ] ] [ \ ] ] ]  
 [ [ \v\ \ ] [ -\ ] ]

3.

[ \v\ \ ] [ \ ] [ \ ] [ \v\ \ ] [ \ ]  
           d3          d3          d3          d2          d1  
 [ \ ] [ \v\ \ ] [ -\ \ ] [ \ ]  
           d3          d2          d1          d0  
 [ \v\ \ ] [ -\ ]  
           d1          d0

4.1

[ \v\ \ ] [ \ ] [ \ ] [ \v\ \ ] [ \ ]  
           d3          d3          d3          d2          d1  
 [ \ ] [ \v\ \ ] [ \v\ \ ] [ \ ]  
           d3          d2          d1          d0  
 [ \ \ ] [ \v\ \ ] [ \ ]  
           d1          d0

4.3a

[ \v\ \ ] [ \ ] [ \ \v\ \ ] [ \ ]  
           d3          d3          d2          d1  
 [ \ \v\ \ ] [ \ \ ] [ \ ]  
           d2          d1          d0  
 [ \ \ ] [ \ \ ]  
           d1          d0

5.  
6.

[ \v\ \ ]      [ \ ] [ \ \v\ \ ]      [ \ ]  
                   d3;                   d3;                   d2./;                   d1;

[ \ \v\-\ ]      [ \ \-\ ]      [ \ ]  
                   d2./                   d.                   d0

[ \ \ ]      [ \-\ ]  
                   d1.                   d0

-----

Gen. 1.13: wayhî 'ereb wayhî bōqer yôm šēlîsî

{ < ( \v\ ) M ( \ ) > < ( \v\ ) M ( \ ) > } < ( \ = \ ) >

2.12a

{ < ( \v\ ) M ( \ ) > < ( \v\ ) M ( \ ) > } < ( \ \ ) >

2.17

{ < [ \v\ ] M [ \ ] > < [ \v\ ] M [ \ ] > } < [ \ \ ] >

2.27

{ < [ \v\ \ ] > < [ \v\ \ ] > } < [ \ \ ] >

2.29b

[ [ \v\ \ ] ] [ [ \v\ \ ] ] [ [ \ \ ] ]

3.

[ \v\ \ ]      [ \v\ \ ]      [ \ \ ]  
                   d2                   d1                   d0

No hemistiching because last IPC too short.

4.3a

$$\left[ \begin{array}{cc} \Delta & \Delta \\ \Delta & \Delta \end{array} \right]_{d1} \quad \left[ \begin{array}{cc} \Delta & \Delta \\ \Delta & \Delta \end{array} \right]_{d0}$$

5.

6.

$$\left[ \begin{array}{cc} \Delta & \Delta \\ \Delta & \Delta \end{array} \right]_{d1.} \quad \left[ \begin{array}{cc} \Delta & \Delta \\ \Delta & \Delta \end{array} \right]_{d0}$$

appendix C

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APPENDIX D  
 (EXODUS 40.1-16)

ex. 40.1: waydabbēr YHWH 'e1 mōšeh1ē'mōr

< ( < √Δ ) M ( Δ ) M (-Δ-q )

2.17

< [ √Δ ] M [ Δ ] M [-Δ-q ]

2.27

< [ √Δ Δ ] M [-Δ-q ]

2.29a

2.29b

[ [ Δ Δ ] [-Δ-q ] ]

3.

[ Δ Δ ] [-Δ-q ]  
           d1                  d0

4.1

[ Δ Δ ] [ / \ Δ -q ]  
           d1                  d0

4.5

[ Δ Δ ] [ / \ Δ q ]  
           d1                  d0

5.

6.

[ Δ Δ ] [ / \ -Δ q ]  
           d1                  d0

ex. 40.2: bēyôm haḥōdeš hāri'šōn, bē'eḥād laḥōdeš  
tāqîm 'et miškar, 'ōhel mō'ēd

< ( [ [ Δ ] \* [ Δ = Δ ] ] @ [ Δ @ Δ ] ) MM  
( √Δ ) M ( [ -Δ ] \* [ Δ \* Δ ] ) >

2.12a

< ( [ [ Δ ] \* [ Δ Δ ] ] @ [ Δ Δ ] ) MM  
( √Δ ) M ( [ -Δ ] \* [ Δ Δ ] ) >

2.13b

< ( [ [ [ Δ ] [ Δ Δ ] ] ] @ [ Δ Δ ] ) MM  
( √Δ ) M ( [ [ -Δ ] [ Δ Δ ] ] ) >

2.16d

< ( [ [ Δ ] [ Δ Δ ] ] [ Δ Δ ] ) MM  
( √Δ ) M ( [ -Δ ] [ Δ Δ ] ) >

2.17

< [ [ [ Δ ] [ Δ Δ ] ] [ Δ Δ ] ] MM  
[ √Δ ] M [ [ -Δ ] [ Δ Δ ] ] >

2.26a

< [ [ [ Δ ] [ Δ Δ ] ] [ Δ Δ ] ] MM  
[ [ √Δ ] M [ [ -Δ ] [ Δ Δ ] ] ] >

2.29a

2.29b

[ [ [ [ Δ ] [ Δ Δ ] ] [ Δ Δ ] ]  
 [ [ ΔΔ ] M [ [ -Δ ] [ Δ Δ ] ] ] ]

3.

[ Δ ] [ Δ Δ ] [ Δ Δ ]  
       d2              d1              d0  
 [ ΔΔ ] [ -Δ ] [ Δ Δ ]  
       d1              d1              d0

4.1

[ Δ ] [ Δ Δ ] [ Δ Δ ]  
       d2              d1              d0  
 [ ΔΔ ] [ Δ Δ ] [ Δ Δ ]  
       d1              d1              d0

4.3a

[ Δ Δ Δ ] [ Δ Δ ]  
           d1              d0  
 [ ΔΔ ] [ Δ Δ ] [ Δ Δ ]  
       d1              d1              d0

5.

6.

[ Δ-Δ Δ ] [ Δ Δ ]  
           d1              d0  
 [ ΔΔ ] [ Δ-Δ ] [ Δ Δ ]  
       d1              d1              d0

-----  
 ex. 40.3: wěsamtā šām 'et 'ārôn hā'edūt  
 wěsakkōtā 'al hā'ārôn 'et happārōket

( ( ΔΔ ) M ( Δ ) M ( -Δ \* Δ ) )  
 ( ( ΔΔ ) M ( -Δ ) M ( -Δ ) )

2.12a

< (  $\Delta v$  ) M (  $\Delta$  ) M (  $-\Delta \Delta$  ) >

< (  $\Delta v$  ) M (  $-\Delta$  ) M (  $-\Delta$  ) >

2.17

< [  $\Delta v$  ] M [  $\Delta$  ] M [  $-\Delta \Delta$  ] >

< [  $\Delta v$  ] M [  $-\Delta$  ] M [  $-\Delta$  ] >

2.27

< [  $\Delta v$   $\Delta$  ] M [  $-\Delta \Delta$  ] >

< [  $\Delta v$   $-\Delta$  ] M [  $-\Delta$  ] >

2.29a

2.29b

[ [  $\Delta v$   $\Delta$  ] [  $-\Delta \Delta$  ] ]

[ [  $\Delta v$   $-\Delta$  ] [  $-\Delta$  ] ]

3.

[  $\Delta v$   $\Delta$  ] [  $-\Delta \Delta$  ]

[  $\Delta v$   $-\Delta$  ] [  $-\Delta$  ]

**d1** **d0**  
**d1** **d0**

4.1

[  $\Delta v$   $\Delta$  ] [  $\Delta \Delta \Delta$  ]

[  $\Delta v$   $\Delta \Delta$  ] [  $\Delta \Delta$  ]

**d1** **d0**  
**d1** **d0**

4.2

[ /v\ \\_ ] [ /\ ] [ \\_ \\_ ]  
           d1          d1          d0  
 [ /v\ \\_ ] [ /\ \\_ ]  
           d1          d0

5.  
6.

[ /v\ \\_ ] [ /\ ] [ \\_ \\_ ]  
           d1          d1          d0  
 [ /v\ \\_ ] [ /\ -\\_ ] [ /\ -\\_ ]  
           d1                  d0

---

ex. 40.4: wēhēbē'tā 'et haššulhān wē'āraktā 'et 'erkô  
 wēhēbē'tā 'et hammērōrah weha'ālētā 'et nērōtēhā

{ < ( /v\ ) M ( -\\_ ) > < ( /v\ ) M ( -\\_ ) > }  
 { < ( /v\ ) M ( -\\_ ) > < ( /v\ ) M ( -\\_ ) > }

2.17

{ < [ /v\ ] M [ -\\_ ] > < [ /v\ ] M [ -\\_ ] > }  
 { < [ /v\ ] M [ -\\_ ] > < [ /v\ ] M [ -\\_ ] > }

2.27

{ < [ /v\ -\\_ ] > < [ /v\ -\\_ ] > }  
 { < [ /v\ -\\_ ] > < [ /v\ -\\_ ] > }

2.29a  
2.29b

[ [ /v\ -\\_ ] [ /v\ -\\_ ] ]

[ [ /v\ -/\ ] [ /v\ -/\ ] ]

3.

[ /v\ -/\ ] [ /v\ -/\ ]  
           **d1**          **d0**  
 [ /v\ -/\ ] [ /v\ -/\ ]  
           **d1**          **d0**

4.1

[ /v\ /\ /\ ] [ /v\ /\ /\ ]  
                   **d1**                  **d0**  
 [ /v\ /\ /\ ] [ /v\ /\ /\ ]  
                   **d1**                  **d0**

4.2

[ /v\ ] [ /\ /\ ] [ /v\ ] [ /\ /\ ]  
           **d2**          **d1**          **d1**          **d0**  
 [ /v\ ] [ /\ /\ ] [ /v\ ] [ /\ /\ ]  
           **d2**          **d1**          **d1**          **d0**

5.

6.

[ /v\ ] [ /\-/\ ] [ /v\ ] [ /\-/\ ]  
           **d2./s**          **d1s**          **d1.**          **d0**  
 [ /v\ ] [ /\ /\ ] [ /v\ ] [ /\ /\ ]  
           **d2./s**          **d1s**          **d1.**          **d0**

---

ex.40.5: wēnātattāh 'et mizbah hazzāhāv liqṭōret  
           lipnē 'ārōn hā'ēdut  
           wēsamtā 'et māsak happetaḥ lammiškan

( ( /v\ ) M (-/\ \* /\ ) MM ( /\ ) MM ( [/\ ] \* [/\ \* /\ ] ) )

( (  $\Delta$  ) M ( - $\Delta$  \*  $\Delta$  ) MM (  $\Delta$  ) )

2.12a

( (  $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM (  $\Delta$  ) MM ( [  $\Delta$  ] \* [  $\Delta$   $\Delta$  ] ) )

( (  $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM (  $\Delta$  ) )

2.13b

( (  $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM (  $\Delta$  ) MM ( [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ) )

( (  $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM (  $\Delta$  ) )

2.17

( [  $\Delta$  ] M [ - $\Delta$   $\Delta$  ] MM [  $\Delta$  ] MM [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] )

( [  $\Delta$  ] M [ - $\Delta$   $\Delta$  ] MM [  $\Delta$  ] )

2.23a

( [  $\Delta$  ] M [ - $\Delta$   $\Delta$  ] MM [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] )

( [  $\Delta$  ] M [ - $\Delta$   $\Delta$  ] MM [  $\Delta$  ] )

2.29a

2.29b

[ [  $\Delta$  ] [ - $\Delta$   $\Delta$  ] [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ]

[ [  $\Delta$  ] [ - $\Delta$   $\Delta$  ] [  $\Delta$  ] ]

3.

[ $\Delta$ ]	[ - $\Delta$ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ $\Delta$ ]
<b>d3</b>	<b>d2</b>	<b>d1</b>	<b>d1</b>	<b>d0</b>
[ $\Delta$ ]	[ - $\Delta$ $\Delta$ ]	[ $\Delta$ ]		
<b>d2</b>	<b>d1</b>	<b>d0</b>		

4.1

[ $\Delta$ v $\Delta$ ]	[ $\wedge$ $\Delta$ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ $\Delta$ ]
d3	d2	d1	d1	d0
[ $\Delta$ v $\Delta$ ]	[ $\wedge$ $\Delta$ $\Delta$ ]	[ $\Delta$ ]		
d2	d1	d0		

5.  
6.

[ $\Delta$ v $\Delta$ ]	[ $\wedge$ - $\Delta$ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ ]	[ $\Delta$ $\Delta$ ]
d3s	d2./s	d1s	d1.	d0
[ $\Delta$ v $\Delta$ ]	[ $\wedge$ - $\Delta$ $\Delta$ ]	[ $\Delta$ ]		
d2./s	d1.	d0		

ex. 40.6: wēnātattā 'ēt mizbah hā'ōlāh  
lipné petah miškan, 'ōhel mō'ēd.

( (  $\Delta$ v $\Delta$  ) M ( - $\Delta$  \*  $\Delta$  ) MM  
( [  $\Delta$  ] \* [ [  $\Delta$  ] \* [ [  $\Delta$  ] \* [  $\Delta$  \*  $\Delta$  ] ] ] ) )

2.12a

( (  $\Delta$ v $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM  
( [ [  $\Delta$  ] \* [ [  $\Delta$  ] \* [ [  $\Delta$  ] \* [  $\Delta$   $\Delta$  ] ] ] ] ) )

2.13b

( (  $\Delta$ v $\Delta$  ) M ( - $\Delta$   $\Delta$  ) MM  
( [ [  $\Delta$  ] [ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ] ] ) )

2.17

2.23d

( [  $\Delta$ v $\Delta$  ] M [ - $\Delta$   $\Delta$  ] Z  
[ [  $\Delta$  ] [ [  $\Delta$  ] [ [  $\Delta$  ] [  $\Delta$   $\Delta$  ] ] ] ] )



2.29a  
2.29b

[ [ \v\ ] [ -\ \ ]  
[ [ \ ] [ [ \ ] [ [ \ ] [ \ \ ] ] ] ] ]

3.

[ \v\ ] [ -\ \ ]  
d1 d0  
[ \ ] [ \ ] [ \ ] [ \ \ ]  
d1 d1 d1 d0

4.1

[ \v\ ] [ / \ \ ]  
d1 d0  
[ \ ] [ \ ] [ \ ] [ \ \ ]  
d1 d1 d1 d0

4.2

[ \v\ ] [ / \ ] [ \ \ ]  
d1 d1 d0  
[ \ ] [ \ ] [ \ ] [ \ \ ]  
d1 d1 d1 d0

4.3b

[ \v\ ] [ / \ ] [ \ \ ]  
d1 d1 d0  
[ \ ] [ \ ] [ \ \ ]  
d1 d1 d0

5.

6.

[ \v\ ] [ / \ ] [ \ \ ]  
d1 d1 d0  
[ \ ] [ \ ] [ \ \ ]  
d1 d1 d0

ex.40.7: wēnātattā 'et hakkiyyōr bēn 'ōhel mō'ēd ûbēn  
 hammizbēah  
 wēnātattā šām māyim

< ( √ ) M ( - ) MM  
 ( [ - \* ] @ [ - ] ) >  
 < ( √ ) M ( ) m ( ) >

2.12a

< ( √ ) M ( - ) MM  
 ( [ - ] @ [ - ] ) >  
 < ( √ ) M ( ) m ( ) >

2.17

< [ √ ] M [ - ] MM  
 [ [ - ] @ [ - ] ] >  
 < [ √ ] M [ ] m [ ] >

2.23d

2.24

< [ √ ] M [ - ] Z  
 [ [ - ] @ [ - ] ] >  
 < [ √ ] M [ ] m [ ] >

2.27

< [ √ - ] Z  
 [ [ - ] @ [ - ] ] >  
 < [ √ ] m [ ] >

2.29a  
2.29b

[ [ \v\ -\ ]  
       [ [-\ \ ] [-\ ] ] ]  
 [ [ \v\ \ ] [ \ ] ] ]

3.

[ \v\ -\ ]            [ -\ \ ]            [ -\ ]  
                   d1                    d1                    d0  
 [ \v\ \ ]            [ \ ]  
                   d1                    d0

4.1

[ \v\ \ \ ]            [ \ \ \ ]            [ \ \ ]  
                   d1                    d1                    d0  
 [ \v\ \ ]            [ \ ]  
                   d1                    d0

4.2

[ \v\ ] [ \ \ ]            [ \ \ \ ]            [ \ \ ]  
           d2                    d1                    d1                    d0  
 [ \v\ \ ]            [ \ ]  
                   d1                    d0

5.

6.

[ \v\ ] [ \ -\ ]            [ \ -\ \ ]            [ \ \ ]  
           d2. /                    d1.                    d1.                    d0  
 [ \v\ \ ]            [ \ ]  
                   d1.                    d0

ex.40.8: wēśamtā 'et heḥāṣēr sābîb  
 wērātattā 'et māsak ša'ar heḥāṣēr

< ( /v/ ) M ( -/ / ) M ( / / ) >  
 < ( /v/ ) M ( [ -/ / ] \* [ / / \* / / ] ) >

2.12a

< ( /v/ ) M ( -/ / ) M ( / / ) >  
 < ( /v/ ) M ( [ -/ / ] \* [ / / / / ] ) >

2.13b

< ( /v/ ) M ( -/ / ) M ( / / ) >  
 < ( /v/ ) M ( [ [ -/ / ] [ / / / / ] ] ) >

2.17

< [ /v/ ] M [ -/ / ] M [ / / ] >  
 < [ /v/ ] M [ [ -/ / ] [ / / / / ] ] >

2.27

< [ /v/ -/ / ] M [ / / ] >  
 < [ /v/ ] M [ [ -/ / ] [ / / / / ] ] >

2.29a

2.29b

[ [ /v/ -/ / ] [ / / ] ]  
 [ [ /v/ ] [ [ -/ / ] [ / / / / ] ] ]

3.

$[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d0}$   
 $[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d1} \quad \text{d0}$

4.1

$[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d0}$   
 $[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d1} \quad \text{d0}$

5.

6.

$[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d0}$   
 $[ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } ] \text{ } [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \text{ } \text{ } \text{ } ]$   
 $\text{d1} \quad \text{d1} \quad \text{d0}$

---

ex.40.9: wēlāqahtā 'et šemer hammišhāh  
           ûmāšahtā 'et hammiškār wē'et kol 'āser bô  
           wēqiddaštā 'otô wē'et kol kēlāw wēhāyāh qōdes

$( ( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} * \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) )$   
 $( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( [ - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] + [ - - - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] ) ) )$   
 $( ( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( [ \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] + [ - - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] ) ) ( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) ) ) )$

2.12a

2.12b

$( ( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) )$   
 $( ( \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ) M ( [ - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] \& [ - - - \begin{smallmatrix} \text{ } \\ \text{ } \\ \text{ } \end{smallmatrix} ] ) ) )$

{ ( ( /v\ ) M ( [/\] & [- -/\] ) ) > ( ( /v\ ) M ( / \ ) ) } }

2.17

{ ( [ /v\ ] M [ -/\ / \ ] ) >  
( [ /v\ ] M [ [ -/\ ] & [ - - -/\ ] ] ) } }  
{ ( [ /v\ ] M [ [/\] & [- -/\] ] ) > ( [ /v\ ] M [ / \ ] ) } }

2.21a

{ ( [ /v\ ] M [ -/\ / \ ] ) >  
( [ /v\ ] M [ -/\ ] & [ - - -/\ ] ) } }  
{ ( [ /v\ ] M [ / \ ] & [ - -/\ ] ) > ( [ /v\ ] M [ / \ ] ) } }

2.21b

{ ( [ /v\ ] M [ -/\ / \ ] ) >  
( [ /v\ ] M [ -/\ ] M [ - - -/\ ] ) } }  
{ ( [ /v\ ] M [ / \ ] M [ - -/\ ] ) > ( [ /v\ ] M [ / \ ] ) } }

2.27

{ ( [ /v\ ] M [ -/\ / \ ] ) >  
( [ /v\ -/\ ] M [ - - -/\ ] ) } }  
{ ( [ /v\ / \ ] M [ - -/\ ] ) > ( [ /v\ / \ ] ) } }

2.29a

2.29b

[ [ [ /v\ ] [ -/\ / \ ] ] ]  
[ [ /v\ -/\ ] [ - - -/\ ] ] ] ]  
[ [ [ /v\ / \ ] [ - -/\ ] ] [ [ /v\ / \ ] ] ] ]

3.

[ $\Delta$ v $\Delta$ ] d2	[ - $\Delta$ $\Delta$ ] d1	[ $\Delta$ v $\Delta$ - $\Delta$ ] d1	[ - - - $\Delta$ ] d0
[ $\Delta$ v $\Delta$ $\Delta$ ] d2	[ - - $\Delta$ ] d1	[ $\Delta$ v $\Delta$ $\Delta$ ] d0	

4.1

[ $\Delta$ v $\Delta$ ] d2	[ $\Delta$ $\Delta$ $\Delta$ ] d1	[ $\Delta$ v $\Delta$ $\Delta$ ] d1	[ $\Delta$ $\Delta$ $\Delta$ ] d0
[ $\Delta$ v $\Delta$ $\Delta$ ] d2	[ $\Delta$ $\Delta$ ] d1	[ $\Delta$ v $\Delta$ ] d0	

4.4 n/a

5.

6.

[ $\Delta$ v $\Delta$ ] d2./s	[ $\Delta$ - $\Delta$ $\Delta$ ] d1s	[ $\Delta$ v $\Delta$ $\Delta$ - $\Delta$ ] d1.	[ $\Delta$ - $\Delta$ - $\Delta$ - $\Delta$ ] d0
[ $\Delta$ v $\Delta$ $\Delta$ ] d2./.	[ $\Delta$ - $\Delta$ - $\Delta$ ] d1.	[ $\Delta$ v $\Delta$ ] d0	

ex. 40.10: ūmāšāḥtā 'et mizbah hā'ōlāh wē'et kol kēlāw  
 wēqiddāštā 'et hammizbēah  
 wēhāyāh hammizbēah qōdeš qodāšim

( (  $\Delta$ v $\Delta$  ) M ( [ - $\Delta$  \*  $\Delta$  ] + [ - - $\Delta$  ] ) )  
 { ( (  $\Delta$ v $\Delta$  ) M ( - $\Delta$  ) ) ( (  $\Delta$ v $\Delta$  ) M (  $\Delta$  ) M (  $\Delta$  \*  $\Delta$  ) ) }

2.12a

( (  $\Delta$ v $\Delta$  ) M ( [ - $\Delta$   $\Delta$  ] + [ - - $\Delta$  ] ) )  
 { ( (  $\Delta$ v $\Delta$  ) M ( - $\Delta$  ) ) ( (  $\Delta$ v $\Delta$  ) M (  $\Delta$  ) M (  $\Delta$   $\Delta$  ) ) }

2.17

$$\langle [ \underline{v} ] M [ [ -\Delta \Delta ] + [ - -\Delta ] ] \rangle$$

$$\langle \langle [ \underline{v} ] M [ -\Delta ] \rangle \langle [ \underline{v} ] M [ \Delta ] M [ \Delta \Delta ] \rangle \rangle$$

2.21a  
2.21b

$$\langle [ \underline{v} ] M [ -\Delta \Delta ] Z [ - -\Delta ] \rangle$$

$$\langle \langle [ \underline{v} ] M [ -\Delta ] \rangle \langle [ \underline{v} ] M [ \Delta ] M [ \Delta \Delta ] \rangle \rangle$$

2.27

$$\langle [ \underline{v} ] M [ -\Delta \Delta ] Z [ - -\Delta ] \rangle$$

$$\langle \langle [ \underline{v} -\Delta ] \rangle \langle [ \underline{v} \Delta ] M [ \Delta \Delta ] \rangle \rangle$$

2.29a  
2.29b

$$[ [ \underline{v} ] [ -\Delta \Delta ] [ - -\Delta ] ]$$

$$[ [ [ \underline{v} -\Delta ] ] [ [ \underline{v} \Delta ] [ \Delta \Delta ] ] ]$$

3.

$$[ \underline{v} ]_{d2} [ -\Delta \Delta ]_{d1} [ - -\Delta ]_{d0}$$

$$[ \underline{v} -\Delta ]_{d1} [ \underline{v} \Delta ]_{d1} [ \Delta \Delta ]_{d0}$$

4.1

$$[ \underline{v} ]_{d2} [ \wedge \Delta \Delta ]_{d1} [ \wedge \wedge \Delta ]_{d0}$$

$$[ \underline{v} \wedge \Delta ]_{d1} [ \underline{v} \Delta ]_{d1} [ \Delta \Delta ]_{d0}$$

4.2

$$[ \underline{v} ]_{d2} [ \wedge \Delta \Delta ]_{d1} [ \wedge \wedge \Delta ]_{d0}$$

$$[ \underline{v} ]_{d2} [ \wedge \Delta ]_{d1} [ \underline{v} \Delta ]_{d1} [ \Delta \Delta ]_{d0}$$



5.  
6.

[ /v\ ] [ /\-/\ \ ] [ /\-/\-/\ ]  
d2./ d1. d0  
[ /v\ ] [ /\-/\ ] [ /v\ \ ] [ \ \ ]  
d2./ d1. d1. d0

---

ex. 40.11: ūmāṣaṭtā 'et hakkiiyōr wē'et karnō wēqiddaṣṭā  
'atā

( ( /v\ ) M ( -/\ + -/\ ) ) ( ( /v\ ) m ( \ ) )

2.12b

( ( /v\ ) M ( -/\ & -/\ ) ) ( ( /v\ ) m ( \ ) )

2.17

( [ /v\ ] M [ -/\ & -/\ ] ) ( [ /v\ ] m [ \ ] )

2.21a

2.21b

( [ /v\ ] M [ -/\ ] M [ -/\ ] ) ( [ /v\ ] m [ \ ] )

2.27

( [ /v\ -/\ ] M [ -/\ ] ) ( [ /v\ \ ] )

2.29a

2.29b

[ [ /v\ -/\ ] [ -/\ ] ] [ [ /v\ \ ] ]

3.

$[ \underline{\vee} \underline{\Delta} \ - \underline{\Delta} ] \quad [ \ - \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d0}$

4.1

$[ \underline{\vee} \underline{\Delta} \ \wedge \ \underline{\Delta} ] \quad [ \ \wedge \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d0}$

4.2

$[ \underline{\vee} \underline{\Delta} \ \wedge \ \underline{\Delta} ] \quad [ \ \wedge \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} ] \quad [ \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

5.

6.

$[ \underline{\vee} \underline{\Delta} \ \wedge \ - \underline{\Delta} ] \quad [ \ \wedge \ - \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1.} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} ] \quad [ \ \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1.} \quad \quad \quad \mathbf{d0}$

---

ex.40.12: wēhiqrabtā 'et 'ahārōn wē'et bānāw  
               'el petah 'ōhel mō'ēd  
 wērāḥaṣtā 'ōtām bammāyim

$\langle \langle \underline{\vee} \underline{\Delta} \rangle \mathbf{M} \langle \ - \underline{\Delta} \ + \ - \underline{\Delta} \rangle \mathbf{MM} \langle [ \ - \underline{\Delta} ] \ * \ [ \ \underline{\Delta} \ * \ \underline{\Delta} ] \rangle \rangle$

$\langle \langle \underline{\vee} \underline{\Delta} \rangle \mathbf{m} \langle \ \underline{\Delta} \rangle \mathbf{M} \langle \ \underline{\Delta} \rangle \rangle$

2.12a

2.12b

$\langle \langle \Delta \nabla \Delta \rangle M \langle -\Delta \& -\Delta \rangle MM \langle [ -\Delta ] * [ \Delta \Delta ] \rangle \rangle$   
 $\langle \langle \Delta \nabla \Delta \rangle m \langle \Delta \rangle M \langle \Delta \rangle \rangle$

2.13b

$\langle \langle \Delta \nabla \Delta \rangle M \langle -\Delta \& -\Delta \rangle MM \langle [ [ -\Delta ] [ \Delta \Delta ] ] \rangle \rangle$   
 $\langle \langle \Delta \nabla \Delta \rangle m \langle \Delta \rangle M \langle \Delta \rangle \rangle$

2.17

$\langle [ \Delta \nabla \Delta ] M [ -\Delta \& -\Delta ] MM [ [ -\Delta ] [ \Delta \Delta ] ] \rangle$   
 $\langle [ \Delta \nabla \Delta ] m [ \Delta ] M [ \Delta ] \rangle$

2.21a

2.21b

$\langle [ \Delta \nabla \Delta ] M [ -\Delta ] M [ -\Delta ] MM [ [ -\Delta ] [ \Delta \Delta ] ] \rangle$   
 $\langle [ \Delta \nabla \Delta ] m [ \Delta ] M [ \Delta ] \rangle$

2.23b

$\langle [ \Delta \nabla \Delta ] M [ -\Delta ] M [ -\Delta ] Z [ [ -\Delta ] [ \Delta \Delta ] ] \rangle$   
 $\langle [ \Delta \nabla \Delta ] m [ \Delta ] M [ \Delta ] \rangle$

2.27

$\langle [ \Delta \nabla \Delta -\Delta ] M [ -\Delta ] Z [ [ -\Delta ] [ \Delta \Delta ] ] \rangle$   
 $\langle [ \Delta \nabla \Delta \Delta ] M [ \Delta ] \rangle$

2.29a

2.29b

$[ [ \Delta \nabla \Delta -\Delta ] [ -\Delta ] [ [ -\Delta ] [ \Delta \Delta ] ] ]$   
 $[ [ \Delta \nabla \Delta \Delta ] [ \Delta ] ]$

3.

$$\left[ \begin{array}{c} \underline{\vee} \underline{\vee} \quad -\underline{\vee} \\ d2 \end{array} \right] \quad \left[ -\underline{\vee} \right] \quad \left[ -\underline{\vee} \right] \quad \left[ \underline{\vee} \quad \underline{\vee} \right]$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d1 \quad \quad \quad d0$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d1 \quad \quad \quad d0$$

4.1

$$\left[ \underline{\vee} \underline{\vee} \quad \wedge \quad \underline{\vee} \right] \quad \left[ \wedge \quad \underline{\vee} \right] \quad \left[ \wedge \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \quad \underline{\vee} \right]$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d2 \quad \quad \quad d1 \quad \quad \quad d1 \quad \quad \quad d0$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d1 \quad \quad \quad d0$$

5.

6.

$$\left[ \underline{\vee} \underline{\vee} \quad \wedge -\underline{\vee} \right] \quad \left[ \wedge -\underline{\vee} \right] \quad \left[ \wedge -\underline{\vee} \right] \quad \left[ \underline{\vee} \quad \underline{\vee} \right]$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d2, /s \quad \quad \quad d1s \quad \quad \quad d1. \quad \quad \quad d0$$

$$\left[ \underline{\vee} \underline{\vee} \quad \underline{\vee} \right] \quad \left[ \underline{\vee} \right] \quad \quad \quad d1. \quad \quad \quad d0$$

-----

ex.40.13: wēhilbaštā 'et 'ahārōn 'ēt bigdē haqqōdēs  
 ūmāsahtā 'ōtō wēqiddaštā 'ōtō wēkihērī lî

$$\langle \langle \underline{\vee} \underline{\vee} \rangle \text{ M } \langle -\underline{\vee} \rangle \text{ M } \langle -\underline{\vee} * \underline{\vee} \rangle \rangle$$

$$\langle \langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle \quad \langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle$$

$$\langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle \text{ } \rangle$$

2.12a

$$\langle \langle \underline{\vee} \underline{\vee} \rangle \text{ M } \langle -\underline{\vee} \rangle \text{ M } \langle -\underline{\vee} \underline{\vee} \rangle \rangle$$

$$\langle \langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle \quad \langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle$$

$$\langle \langle \underline{\vee} \underline{\vee} \rangle \text{ m } \langle \underline{\vee} \rangle \rangle \text{ } \rangle$$

2.17

$\langle [ \underline{\vee} \underline{\Delta} ] M [ -\underline{\Delta} ] M [ -\underline{\Delta} \underline{\Delta} ] \rangle$   
 $\langle \langle [ \underline{\vee} \underline{\Delta} ] m [ \underline{\Delta} ] \rangle \quad \langle [ \underline{\vee} \underline{\Delta} ] m [ \underline{\Delta} ] \rangle$   
 $\langle [ \underline{\vee} \underline{\Delta} ] m [ \underline{\Delta} ] \rangle \rangle$

2.27

$\langle [ \underline{\vee} \underline{\Delta} -\underline{\Delta} ] M [ -\underline{\Delta} \underline{\Delta} ] \rangle$   
 $\langle \langle [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \rangle \quad \langle [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \rangle$   
 $\langle [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \rangle \rangle$

2.29a

2.29b

$[ [ \underline{\vee} \underline{\Delta} -\underline{\Delta} ] \quad [ -\underline{\Delta} \underline{\Delta} ] ]$   
 $[ [ [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] ] \quad [ [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] ]$   
 $[ [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] ] ]$

3.

$[ \underline{\vee} \underline{\Delta} -\underline{\Delta} ] \quad [ -\underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.1

$[ \underline{\vee} \underline{\Delta} \wedge \underline{\Delta} ] \quad [ \wedge \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.2

$[ \underline{\vee} \underline{\Delta} \wedge \underline{\Delta} ] \quad [ \wedge ] \quad [ \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$   
 $[ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ] \quad [ \underline{\vee} \underline{\Delta} \underline{\Delta} ]$   
 $\quad \quad \quad \mathbf{d2} \quad \quad \quad \mathbf{d1} \quad \quad \quad \mathbf{d0}$

4.2

$[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   
 $\text{d2}$   $\text{d1}$   $\text{d1}$   $\text{d0}$   
 $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   
 $\text{d2}$   $\text{d1}$   $\text{d0}$

5.  
6.

$[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   
 $\text{d2./}$   $\text{d1}$   $\text{d1.}$   $\text{d0}$   
 $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   
 $\text{d2./}$   $\text{d1.}$   $\text{d0}$

-----  
 Ex.40.14: wě'et bānâw taqrîb wěhilbaštā 'ōtām kuttōnōt

$\langle \langle -\text{ } \text{ } \rangle \text{ m } \langle \text{ } \text{ } \rangle \rangle$   $\langle \langle \text{ } \text{ } \rangle \text{ m } \langle \text{ } \text{ } \rangle \text{ m } \langle \text{ } \text{ } \rangle \rangle$

2.17

$\langle [ -\text{ } \text{ } ] \text{ m } [ \text{ } \text{ } ] \rangle$   $\langle [ \text{ } \text{ } ] \text{ m } [ \text{ } \text{ } ] \text{ m } [ \text{ } \text{ } ] \rangle$

2.27

$\langle [ -\text{ } \text{ } \text{ } ] \rangle$   $\langle [ \text{ } \text{ } \text{ } ] \text{ m } [ \text{ } \text{ } ] \rangle$

2.27b

2.29a

$[ [ -\text{ } \text{ } \text{ } ] ]$   $[ [ \text{ } \text{ } \text{ } ] [ \text{ } \text{ } ] ]$

3.

$[ -\text{ } \text{ } ]$   $[ \text{ } \text{ } ]$   $[ \text{ } \text{ } \text{ } ]$   $[ \text{ } \text{ } ]$   
 $\text{d1}$   $\text{d0}$   $\text{d1}$   $\text{d0}$

4.1

$[ \wedge \underline{\Delta} ]_{d1}$      $[ \underline{\Delta} ]_{d0}$              $[ \underline{\Delta} \underline{\Delta} ]_{d1}$      $[ \underline{\Delta} ]_{d0}$

5.

6.

$[ \wedge - \underline{\Delta} ]_{d1}$      $[ \underline{\Delta} ]_{d0}$              $[ \underline{\Delta} \underline{\Delta} ]_{d1}$      $[ \underline{\Delta} ]_{d0}$

-----

ex. 40.15: ūmāšāhtā 'ōtām ka'āšer māšāhtā 'et 'ābîhem  
wēkîharû lî  
wēhāyētāh lihyōt iāhem mošhātām likhunnat 'ōlām  
lēdōrōtām

$\{ \langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle MM \langle \langle - \underline{\Delta} \rangle M \langle - \underline{\Delta} \rangle \rangle \rangle$   
 $\langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle \rangle \}$   
 $\langle \langle \underline{\Delta} \rangle M \langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle M \langle \underline{\Delta} \rangle \rangle \rangle$   
 $M \langle \underline{\Delta} * \underline{\Delta} \rangle MM \langle \underline{\Delta} \rangle \}$

Ex. 17

$\{ \langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle MM \langle \langle [ - \underline{\Delta} ] M [ - \underline{\Delta} ] \rangle \rangle \rangle$   
 $\langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle \rangle \}$   
 $\langle \langle \underline{\Delta} \rangle M \langle \langle [ \underline{\Delta} ] m [ \underline{\Delta} ] M [ \underline{\Delta} ] \rangle \rangle \rangle$   
 $M \langle \underline{\Delta} * \underline{\Delta} \rangle MM \langle \underline{\Delta} \rangle \}$

2.27

$\{ \langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle MM \langle \langle [ - \underline{\Delta} - \underline{\Delta} ] \rangle \rangle \rangle$   
 $\langle \langle \underline{\Delta} \rangle m \langle \underline{\Delta} \rangle \rangle \}$

$( ( \angle v \Delta ) M ( ( [ \angle v \Delta \Delta ] M [ \Delta ] ) ) )$   
 $M ( \Delta * \Delta ) MM ( \Delta ) )$

2.28b  
 2.28c]

$( ( ( \angle v \Delta ) m ( \Delta ) MM ( [ [ -\angle v \Delta -\Delta ] ] ) ) )$   
 $( ( \angle v \Delta ) m ( \Delta ) ) )$   
 $( ( \angle v \Delta ) M ( [ [ \angle v \Delta \Delta ] [ \Delta ] ] ) )$   
 $M ( \Delta * \Delta ) MM ( \Delta ) )$

2.12a

$( ( ( \angle v \Delta ) m ( \Delta ) MM ( [ -\angle v \Delta -\Delta ] ) ) )$   
 $( ( \angle v \Delta ) m ( \Delta ) ) )$   
 $( ( \angle v \Delta ) M ( [ [ \angle v \Delta \Delta ] [ \Delta ] ] ) )$   
 $M ( \Delta \Delta ) MM ( \Delta ) )$

2.17

$( ( [ \angle v \Delta ] m [ \Delta ] MM [ -\angle v \Delta -\Delta ] ) )$   
 $( [ \angle v \Delta ] m [ \Delta ] ) )$   
 $( [ \angle v \Delta ] M [ [ \angle v \Delta \Delta ] [ \Delta ] ] )$   
 $M [ \Delta \Delta ] MM [ \Delta ] )$

2.23b

$( ( [ \angle v \Delta ] m [ \Delta ] MM [ -\angle v \Delta -\Delta ] ) )$   
 $( [ \angle v \Delta ] m [ \Delta ] ) )$   
 $( [ \angle v \Delta ] M [ [ \angle v \Delta \Delta ] [ \Delta ] ] )$



M [ Δ Δ ] Z [ Δ ] >

2.27

( < [ Δ Δ ] MM [ -Δ Δ ] >

( [ Δ Δ ] > )

( [ Δ Δ ] M [ [ Δ Δ ] [ Δ ] ]

M [ Δ Δ ] Z [ Δ ] >

2.29a

2.29b

[ [ [ Δ Δ ] [ -Δ Δ ] ]

[ [ Δ Δ ] ] ]

[ [ Δ Δ ] [ [ Δ Δ ] [ Δ ] ]

[ Δ Δ ] [ Δ ] ]

3.

[ Δ Δ ] [ -Δ Δ ] [ Δ Δ ]  
<sub>d2</sub> <sub>d1</sub> <sub>d0</sub>  
 [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
<sub>d3</sub> <sub>d3</sub> <sub>d2</sub> <sub>d1</sub> <sub>d0</sub>

4.1

[ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
<sub>d2</sub> <sub>d1</sub> <sub>d0</sub>  
 [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
<sub>d3</sub> <sub>d3</sub> <sub>d2</sub> <sub>d1</sub> <sub>d0</sub>

4.2

[ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
<sub>d2</sub> <sub>d1</sub> <sub>d0</sub>  
 [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ] [ Δ Δ ]  
<sub>d3</sub> <sub>d3</sub> <sub>d2</sub> <sub>d1</sub> <sub>d0</sub>

4.2

[ /v\ \ ] [ / \ /v\ ] [ / \ \ ] [ /v\ ] [ \ ]  
           d2                  d2                  d1                  d1                  d0  
 [ /v\ ] [ /v\ \ ] [ \ ] [ \ \ ] [ \ ] [ \ ]  
           d3                  d3                  d2                  d1                  d0

4.3a

[ /v\ \ ] [ / \ /v\ ] [ / \ \ ] [ /v\ ] [ \ ]  
           d2                  d2                  d1                  d1                  d0  
 [ /v\ ] [ /v\ \ \ ] [ \ \ ] [ \ ] [ \ ]  
           d3                  d2                  d1                  d0

5.

6.

[ /v\ \ ] [ / \ /v\ ] [ / \ -\ ] [ /v\ ] [ \ ]  
           d2:s                  d2:/s                  d1                  d1                  d0  
 [ /v\ ] [ /v\ \ \ ] [ \ \ ] [ \ \ ] [ \ ] [ \ ]  
           d3                  d2:/                  d1                  d1                  d0

ex. 40.16: wayya'as' mōseh  
           kēkol 'āser siwwāh YHWH 'ōtō kēn 'āsāh

< ( /v\ ) M ( \ ) >  
 < ( ( ( - -/v\ ) M ( \ ) m ( \ ) ) ) MM  
 ( \ ) M ( /v\ ) >

[2.17

< ( /v\ ) M ( \ ) >  
 < ( ( [ - -/v\ ] M [ \ ] m [ \ ] ) ) MM  
 ( \ ) M ( /v\ ) >

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2.27

$\langle (\underline{v}) M (\underline{v}) \rangle$   
 $\langle (\langle [ - \underline{v} \underline{v} ] m [ \underline{v} ] \rangle) MM$   
 $\langle (\underline{v}) M (\underline{v}) \rangle$

2.28b

2.28c]

$\langle (\underline{v}) M (\underline{v}) \rangle$   
 $\langle (\langle [ [ - \underline{v} \underline{v} ] [ \underline{v} ] ] \rangle) MM$   
 $\langle (\underline{v}) M (\underline{v}) \rangle$

2.17

$\langle [ \underline{v} ] M [ \underline{v} ] \rangle$   
 $\langle [ [ - \underline{v} \underline{v} ] [ \underline{v} ] ] MM [ \underline{v} ] M [ \underline{v} ] \rangle$

2.26a

$\langle [ \underline{v} ] M [ \underline{v} ] \rangle$   
 $\langle [ [ - \underline{v} \underline{v} ] [ \underline{v} ] ] MM [ [ \underline{v} ] M [ \underline{v} ] ] \rangle$

2.27

$\langle [ \underline{v} \underline{v} ] \rangle$   
 $\langle [ [ - \underline{v} \underline{v} ] [ \underline{v} ] ] MM$   
 $[ \underline{v} \underline{v} ] \rangle$

2.29a

2.29b

[ [  $\underline{v}$   $\underline{v}$  ] ]



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