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MAN AND THE HEAVENS - A BIBLICAL VIEW

by

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of the requirements for the Degree of
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DIGEST

The question of the astronomy of the Bible may be formed in two ways. What astronomy exists in the Bible? What purpose does it serve? This thesis is an attempt to answer those questions. Answering the first form of the problem takes the greatest amount of space. The Bible has an observational knowledge of astronomy. By this we mean that the astronomy contained in the Bible is based upon a system of simply watching the events taking place in the sky. The Hebrew watching the heavens saw the obvious features of the night as well as the more prominent pattern of events. Thus, we find in the Bible statements concerning the sun, the moon, the planets (to some degree), and the stars. We also note that the biblical authors believed that the heavenly bodies were governed by law. And finally, we attempt to identify certain of the planets mentioned in the Bible, and, more especially, the constellations that were known and listed at the time.

We next try to answer the question of how much the Bible absorbed from neighboring lands with respect to both astronomy and astrology. This answer helps us to understand the context of biblical astronomy and to date much of it. Moreover, the lack of astrology in the Bible proves to be important in that it leads us to the role played by astronomy in the developing monotheism of the Bible.

It is this role which proves to be the purpose of astronomy for the biblical authors. In the chapter entitled "God and the Heavens," we find that the lands around Israel deified the heavenly bodies. The writers of the Bible, in placing the stars under God's control, demonstrate their belief that only)) /)) ' is God. The awesomeness of the heavens, which are below God, serves to place man in the universe - the topic of the last chapter.

Table of Contents

Introduction

In our highly sophisticated and scientific age, we pride ourselves on the accomplishments of the last few decades. Surely, it is in our time that man has witnessed the most impressive gains in his knowledge of the world. Because of the great respect that has been granted to the scientist, a fear has grown that science is encroaching upon the realm of religion. Science, it is thought, is threatening religion. Its teachings menace those of religion. Sermons are preached and books are written about this terrifying subject. "Godless science" and "ignorant religion" are terms which are frequently bandied about. It is only slowly that we are willing to admit that science and religion are two separate realms.

When man insists on justifying his religion in the terms of science, he sees the threat that science is posing. When man tries to reconcile his religion with science, he again faces this threat. It is only when man separates the two areas that the threats are removed. A religion deals with man and his God; a science deals with man and his world. Certainly, we find an overlapping of interest, but the basic emphases remain different. From whence does this insistence that religion and science must explain each other derive?

The sources of this idea come from man's earliest gropings to understand his world and himself. In discussions on the history of science, the Greeks are usually singled out for especial mention as the first true scientists. This title is given not because the Greeks were the first to examine the world, but because they were the first to systematize such examinations. But the Greeks did not separate their systematic knowledge of the world and their thoughts about the gods. It was the gods who controlled the world. Astrology and divination served as

clues to conduct. The medievals certainly retained this relation. The history of the Catholic church and men of science reflects the control that religion tried to maintain. When science finally broke the bonds, it in turn tried to impose its ideas upon religion. The struggle between the two led to the supposed conflict which exists today.

It is not only in the realm of the physical sciences that this link has existed. History too has been understood as the workings of the gods or God. When Darwin first attempted to point out the struggles of the evolutionary process, religion was threatened. And when the term religion is used, the basic book of religion is included. This, of course, is the Bible. When religion seems to be threatened, it is often the Bible which is attacked. It is the history or the science of the Bible which is questioned. And it is the explanations of the Bible which many attempt to reconcile with the teachings of today.

But the world of the Bible is not the world of today. The world of today is beginning to realize that man operates in more than one realm. Biblical man, however, did exist in one realm. Thus, it is not fair to judge the Bible and its statements about the world except in its own terms. Biblical man, as did the Greek, related the events of the world to the actions of his God. This phenomenon is well-known in the area of history. Briefly stated, it is that history reveals the workings of God in the world of man. The same pattern exists for science. In particular, it may be seen in the field of astronomy.

Biblical man, living close to nature, could witness the events of the heavens more intimately than we do today. With the establishment of God's residence in the heavens, it was no wonder that he saw God's influence in the stars. Thus, when he wrote about the events which he

saw in the sky, he was writing about God. Astronomy does exist in the Bible. It may not be the formalized study that it later became, but it is a description of events. It will be the goal of this thesis to see what role astronomy plays in the Bible.

As the thesis title and the previous discussion suggest, astronomy dealt with man's relation to God. We will see references to the heavenly bodies made to demonstrate God's power. Two main hypotheses will be examined. The first is that astronomy illustrates God's superiority to man. Secondly, it will be seen that God's power over the astral bodies demonstrates His superiority to other gods. Man's relation to the heavens as seen in the Bible, then, is one of establishing the power of God and man's relation to that God.

It is only through the kind and patient advice given to me by my adviser on this thesis, Dr. Sheldon Blank, that any scholarly result has been achieved. It is he who insisted upon my checking sources, who guided me in the straight paths, and who made many suggestions to help clarify points that I was trying to make. And beyond all this, he also corrected my English when it was necessary. I would also like to thank Dr. Hildegard Lewy for her suggestions concerning many of the topics in this thesis. Her scholarship, and Dr. Blank's, have served as models for me in my own efforts.

Chapter 1 - Astronomy

The astronomy we find in the Bible may be considered a primitive form of today's more sophisticated studies. Nonetheless, the study of the heavens was a science in the biblical period. The method used, and still used, was one of observation. Empirical science is no more than this. The Hebrew observed the skies and saw the lights there. He saw the ways of nature and noted the repetition of events. This was the beginning of a natural science; we observe it in the Bible. Today we also watch the events of nature. We establish patterns. From the patterns, we attempt to predict. When our predictions are accurate, we have a science. Thus, observation and pattern are the basis for astronomy. In our modern view, we call the pattern a natural law. In the mind of our Hebrew watching the sky, the pattern was a divine law. Otherwise, the astronomies of the two ages differ only in the matter of sophistication.

Astronomy is the study of the various physical objects which are in the heavens. It includes an attempt to discover the origin of these objects, an identification of them, and a description of their interrelation. It is interesting to note that where science uses the term "origin" and shies away from "creation," the Bible's concern is with the latter word. The Bible wants to know about the "why" of the universe; science deals with "how." Primary to our study is a general view of the world. This will comprise a general description of the earth and the heavens. From this beginning, we may then go to the particular, the heavenly bodies as seen in the Bible: sun, moon, planets, and stars.

One problem which will immediately present itself is that of identification. Many of the modern attempts to translate the biblical names of the constellations, for example, may certainly be questioned. It will be our task to try to resolve such questions. The laws of the interrelationships of the stellar objects are also confusing in the Bible. Our Hebrew knew that laws did exist which gave a pattern to the events he saw in the sky, but he could not describe them. This factor will be of importance to us as we progress. What, then, did our Hebrew see? What was involved in his astronomy?

A. Creation

The theme of the creation of the world is closely linked by the biblical authors to God's power. Cyril H. Powell in his The Biblical Concept of Power refers to this idea when he writes of God's influence on nature. "It is axiomatic that God, being who He is, has all things in His control.... His creative activity is continued in His providential concern over all He has made. Nehemiah 9.6 speaks of this: 'Thou art Yahweh, even thou alone; thou hast made the heaven, the heaven of heavens, with all their host, the earth, and all things that are thereon, the seas and all that is in them, and thou preservest them all..." Passages such as Jeremiah 10.13 and Psalm 147.16f, 65.9f fill in this

picture. The saga of Genssis 1 tells how an almighty God brought all things into being through His creative word, after agitating the formless chaos by a divine storm.[1] This discussion of God's involvement in creation will be dealt with more fully at a later point.

The creation epics in Genesis reveal a God who created the world. The stories vary in their accounts of that creation, however. Gen. 1.1-2.3 tells how God created by His word alone. He spoke, and it was, e.g., "ויהי אור ויהי כן ויאמר אלהים" (Gen. 1.3). The second account is a more physical one telling of how God actually physically constructed the objects of the world (Gen. 2.4-25). The words ברא and יצר are both common here. The latter term is often used for the potter creating his wares from clay (Is. 29.16; 41.25; Jer. 18.4,6; Zech. 11.13; Lam. 4.2; 1 Chron. 4.23). This meaning is particularly appropriate for God's creation of Adam from the dust of the earth as a divine potter (Gen. 2.7-8) as well as the birds and beasts from that same material (Gen. 2.19). The works of nature which are thus created show the creative power of God. This theme is generally carried out throughout the Bible. In the Ten Commandments, we see a reference to God's creation of the heaven and the earth (Ex. 20.11). In a further mentioning of the Sabbath (Ex. 31.17), it is noted that God made the heaven and the earth in six days before resting on the seventh. It is this general statement of God's creating the heavens and earth which is so often repeated (Ex. 20.11; 31.17; Is. 44.24; 45.7, 12; Zech. 12.1; Ps. 102.26-28; 104; Prov. 3.19; Neh. 9.6). II Isaiah mentions that God is the one who stretched out the heavens and spread the earth alone (Is. 44.24). The idea that God alone is the creator is an additional

factor. Power and uniqueness are related by II Isaiah.

The concept of stretching the heavens and establishing the foundations of the earth is utilized by the author of Zechariah 12 (12.1) and the Psalms (102.26-28; 136.1-9; etc.). The book of Proverbs adds the notion that "Wisdom" was present as a helper or adviser for these activities, e.g., "וְאֶהְיֶה אֵצְלוֹ אָמוֹן," "and I [Wisdom] was with Him [God]" at creation (8.30; cf. 3.19; 8.22-30); but this picture does not occur again in the Bible. It is more familiar in the Apocrypha where it is found in Ecclesiasticus and the Wisdom of Solomon (Ecclus. 1.4, 9; 24.8; Wisd. Sol. 7.22, 25). The general view of creation also includes the establishing of light and darkness (Is. 45.7), the heavenly bodies in particular (Ps. 104; 136.1-9; 148.5), and all that exists in the heaven or on the earth (Ex. 20.11, Is. 40.26; Ps. 148.5; Neh. 9.6).[2] The particulars of the various objects of creation are now our subject for concern.

B. Earth

The world consists of the heaven and the earth. In addition to this obvious division, and existing in both, are the waters. These waters surround the earth (Gen. 1.9-10): under, around, and within.

The earth, or dry land, was separated from the water during the creation (Gen. 1.9). The firmament (רָקִיעַ) supports the celestial sea (Gen. 1.15). Beneath the earth lie the fountains of the deep (Gen. 7.11). Fixed boundaries define this entire structure. The earth is bounded by a circle (Is. 40.22). Above the earth, like a vault circumscribed by the horizon, are the heavens. The exact measurements for this construction were worked out by God (Job 38.5).

The earth rests upon foundations or pillars (Hebrew nouns: מוֹסָד, מוֹסְדוֹת, מוּסָדוֹת; verb: יסד - 1 Sam. 2.8; Is. 51.13; Jer. 31.37; Mic. 6.2; Zech. 12.1; Ps. 75.4; 104.5; Job 9.6; 38.4). However, these pillars which are deeply and firmly embedded are subject to God's will and may be disturbed by His anger (Ps. 18.7-16; Job 9.6). And, in a contradiction which is typical of the conflicting statements about the universe in the Bible, we also read that the entire mass rests on nothingness (Job 26.7) and also over the lower waters (Ps. 136.6). In any event, its firmness in place depends upon God.

The shape of the earth, as mentioned above, is circular, based probably on the observation of the horizon. Below it lies the springs of the deep (Job 38.16). And yet further below this is the underworld or "pit" (Job 26.5). In Deuteronomy we also see a reference to a שְׁאוֹל תַּחְתִּיָּה ("lowest depth") in which fires are burning (32.22). At the ends of the earth are the houses of light and darkness which again serve to bound the breadth of the world (Job 38.18-20).

C. Heavens

Beginning with the horizon, we come to the vault of the heavens. They also rest upon pillars (Job 26.11) or foundations (2 Sam. 22.8). The term for heaven presents a certain amount of confusion. Both רָקִיעַ and שָׁמַיִם are commonly used.[3] The conventional translations for these words are "firmament" and "heavens" respectively. To these terms must be addressed three questions: Are the two synonymous? Which one is uppermost? Which contains the stars? In the creation epic of Genesis 1, it would seem that the terms are used somewhat interchangeably. In v.8, רָקִיעַ is called שָׁמַיִם. It is also the place wherein the sun, moon, and stars dwell (vv. 14, 17). Ludwig Köhler suggests that the firmament was indeed uppermost and that the שָׁמַיִם is merely the space between the earth and the רָקִיעַ. He points to Gen. 1.26 where the fowl of the air (שָׁמַיִם) are mentioned to support his argument for the idea that שָׁמַיִם refers to the air between the firmament and the earth.[4] Giovanni Schiaparelli , whose Astronomy in the Old Testament is a classic work in this field, suggests that the רָקִיעַ, on the contrary, is the lowest level of the שָׁמַיִם. He points out that the רָקִיעַ is also described as the שָׁמַיִם» רָקִיעַ - the firmament of the heavens (Gen. 1.14, 15, 17, 20). "It is a vault of great solidity...a transparent vault allowing the light of the stars, which are placed higher, to pass through. Its main duty is to support 'the upper waters,' holding them suspended on high above the earth...(Gen. 1.7)"[5].

Most of the evidence supports the latter point of view. The basic function of the firmament is as Schiaparelli suggests - to hold up the waters on high (Gen. 1.6-7). However, there is also no doubt that

the words are used interchangeably in certain specific cases; Psalm 148, for example, speaks of the waters above the רקיע (v.4). In any event, the appearance of the רקיע is that of solidity with a metallic sheen (Ezek. 1.22-26, Job 37.18.[6]) Whether the firmament is transparent in order to allow the passage of the stellar rays of light or itself contains the heavenly lights is of little importance. The Bible does not have a consistent point of view concerning the רקיע and the רקיע. To insist on one or the other possibility would be to disregard contradictory passages.

Returning to the general conception of the heavens then, we find that they (רקיע or רקיע) are stretched out like curtains or a tent (Is. 40.22; 44.24; 45.12; 51.13; Zech. 12.1; Ps. 104.2). The latter image is used most frequently when God is pictured as one who dwells in the heavens - His tent. The heavens are seen to be of great height and unmeasurable (Jer. 31.37; Ps. 103.11-12; Prov. 25.3). The unmeasurable quality of the skies is limited by the circle of the heavens upon which God walks (Job 22.14). This חוג seems to correspond to the חוג of the earth of which we spoke earlier and to be the horizon where earth and heaven appear to meet. As with the earth, so the heavens are conceived of as having four corners or ends (כנף) - Jer. 49.36). It is from these quarters that the winds come. This is not a challenge to the circularity of the earth or sky. Perhaps quadrants[7] would better express the directions of the homes wherein the winds reside.

C-1. The Ordinances of Heaven

In our definition of a science we gave prime importance to the pattern of events. Consistently in the Bible, we find references to the laws of heaven. Ordinances are also mentioned for the governing of the earth (Jer. 33.25; Ps. 148.6; Job 38.33) but that would take us away from our topic. In one of the verses noted, the laws of heaven are mentioned to illustrate eternity. They are presented as a comparison to the duration of God's covenant with His people. The context, in Jeremiah, is one of a hopeful promise for the future.

In Psalm 148, God is praised for establishing the heavens and the heavenly bodies for all time. It is also worthy of praise that He set up the laws which they must follow. And when Job is challenged by God, he is asked: "Do you know the laws of heaven?" In all these selections, the Hebrew word which is used for "law" is חק or חקה. Now this is a special type of law which is prescribed or decreed by a higher source. It may not be changed or violated by those whom it governs. Indeed, those subject to the control of this type of ordinance are incapable of doing aught but following the established pattern. Thus, the laws of astronomy are those established by God for all time. Sun, moon, and stars all follow the pattern. Man may observe this pattern even though he may not understand it (cf. Job 38.33). Particular instances of these ordinances, such as the rising and the setting of the sun, will be presented as they become appropriate.

C-2. The Heavens (and the Earth) as Living Beings

Heaven and earth are frequently set forth as living presences testifying to the glory of God. This phenomenon is most often seen in the drama of the Psalms. Psalm 19A illustrates this point with its opening of: "השמים מספרים כבוד אל" (19.2). Psalm 148 takes in all of the works of creation in order to praise God: heaven and earth, sun, moon, and stars (148.1-6). Not only do the heavens testify to God's glory, they are often summoned as witnesses against man. In Psalm 50, God calls heaven and earth to be present when He judges His people. Their role on this occasion is not to sing God's glory but to witness His righteousness and justice ("...והגידו שמים צדקו" - Ps. 50.4-5; cf. Is. 1.2).

This role of witness in a trial is an important concept. The traditional Torah reading for Yom Kippur in Deuteronomy, וילך משה, illustrates the idea further. "העידותי בכם היום את השמים ואת הארץ" ("I summon to witness against you today heaven and earth" - Deut. 30.19). The עד (witness) is the character assumed by the heavens. Thus, heaven and earth are beings which can speak of God's glory or act as witnesses for Him.

D. Sun and Moon

The sun and the moon, which we shall consider together, will be examined both as astral phenomena and as deities. This type of approach will be applied to all of the heavenly bodies. The latter consideration, however, will be of greater importance later in the study and will be dealt with more fully there. The sun and the moon are first mentioned in the Bible as the great lights which illuminate the earth. One is the greater light which rules the day: the other is the lesser light which dominates the night. They are set in the firmament (רָקִיעַ) to give light to the earth (Gen. 1.16-18; Ps. 136.1-9). The Hebrew word which both names the lights and describes their basic function is מָאוֹר . There is no concept, of course, of the one being a source of light while the other is only a reflector. Both are sources in their own right, as are all of the heavenly bodies.

D-1. Names (and Functions)

There are four words used in the Bible for the sun. One of these is חַמָּה . It is not used often (Judg. 8.13; 14.18; Job 9.7[8]) and seems to contain no special intrinsic meaning. Another term not frequently used is מָאוֹר (or מְאוֹרֹת) as seen in our earlier discussion and in the book of Job (31.26; 38.19-21). These Job passages are questionable since they refer only to light in general. However, in the statements about the great lights presented above, מָאוֹר certainly appears to be a

reference to the sun. In one of the Job verses, a question is asked about the place where the אור dwells (Job 38.19-21). In the other, אור is spoken of as that which is seen when it shines (Job 31.26).

Not only does the sun give light; it also is a source of heat. This fact we readily discover in the third appellation for the sun, שמש. שמש is derived from √חמם (to be warm) and refers to heat per se as well as to the sun. Psalm 19A, which alludes to the sun (חתן) as a bridegroom, makes mention of its heat (חמתו - 19.7). In the book of Isaiah, we read the word שמש as sun in its own right (Is. 24.23; 30.26). The latter verse in Isaiah speaks of the light of the שמש in contrast to that of the moon. In this case, there can be no doubt that שמש means sun. Two other passages refer to שמש as the sun. They are Job 30.28 and the Song of Songs 6.10. The latter selection speaks of the beloved as one who is "pure as the sun" (צח כחמה).

The most common title for the sun is חמה. Its source is the solar deity of the near Eastern civilizations. This topic, as mentioned earlier, will be a subject for later discussion. The functions of חמה are both light and heat. However, a degree of uncertainty is involved. Certainly the sun gives light. Psalm 136 speaks of the sun as the great light which rules by day (136.7-8). The famous story of Joshua commanding the sun to stand still is indicative of חמה as light-giver (Josh. 10.12-13). The many passages which deal with eclipses also demonstrate that the sun gives light (Is. 13.10; Ezek. 32.7; Joel 2.10, 31; 3.15; Amos 8.9; Mic. 3.6). In general, wherever the sun is mentioned, it is as a source of light (Is. 60.1-2, 19-20; Jer. 31.35; Ezek. 43.1-6; 44.1-2; Ps. 74.16; 136.7-8; Job 30-28). The question we must ask concerns

the sun (שמש) as a source of heat. In Isaiah 49, we read that the Hebrews are being led out of captivity under God's protection: "neither heat (חום) nor sun (שמש) shall smite them" (Is. 49.10). This ostensible separation of heat and sun, as well as the preponderance of passages which speaks only of the sun as a source of light, leads to the tentative conclusion that שמש as the sun is a source of light only. חום, however, refers to the parching effect of the sun's heat;[10] and in that verse, is an intensification of the heat in the desert. Other selections also speak of the heat of שמש (Ps. 19.7, 121.6).

Additional functions are carried out by the sun (שמש). The produce of the earth was understood to be brought out by the sun. When Joseph is blessed, a part of this blessing is the bountiful harvest which is ripened by the sun (Deut. 33.14). It was also realized that the sun could tan the skin. In the Song of Songs, the beloved protests that she is black because she has been darkened by the sun (1.6).

The moon also has several appellations. It is the lesser light of Genesis 1.16-18, and illumination is its basic function. חדש which usually refers to a month is a derivative of the חדש which is the new moon. This is due to the fact that the month begins with the new moon. "Month" is the more normal usage for חדש in the Bible. A more common word for the moon is לבנה. The meaning comes from לבן ("white" or "pale"). It is most often seen written in conjunction with ירח, one of the words for the sun. All of the passages in which both appear are poetic in their imagery (Is. 24.23; 30.26; Song. 6.10). The best example of this is the Song of Songs verse mentioned earlier where the beloved was pictured as being pure (or radiant) as the sun (ירח)

and "fair (pale?) as the moon (יפה כלבנה)" (6.10). In addition, the places in which חמה and לבנה appear are considered to be post-Exilic.[11] This suggests a Babylonian influence which is a general topic to be presented later.

The word which is most often used for the moon is ירח . This word, as is שמש for the sun, seems to be the astronomical term for the moon. It is the one used in connection with other heavenly bodies, e.g., in one of Jacob's dreams the moon appears with the sun and stars (Gen. 37.9). ירח has a secondary meaning of month since the moon determines the length of the month; however, חדש is the more common term.[12] In any event, the moon's purpose is to furnish light at night.[13] On the day of the Lord in Isaiah 13, we come across the phrase "the moon will not cause her light to shine" (v. 10). When deprived of this function, the moon no longer has a purpose. In the glorious future proposed in Isaiah 60, the moon will no longer give light nor withdraw itself for God will shed light and do so everlastingly (vv. 19-20). The moon can also be darkened by God which indicates that it is a light-giver. This topic will be examined under the section dealing with eclipses.

The moon (ירח) has certain secondary functions. One of these is to mark the progress of the seasons (Ps. 104.19; cf. footnote 12). In the blessing of Joseph mentioned in connection with the sun, we notice a possible task for the moon. As a parallel to the produce of the sun, we read of the גרש ירחים . Brown-Driver-Briggs suggests that this means "produce in its season."[14] An alternative to this suggestion, keeping the parallel in mind could be "produce of the moons." (Deut. 33.14). The former possibility seems to be the more likely since it has already

been noted that יָרֵחַ does relate to the seasons. There is also a sinister influence attributed to the moon. We saw that the sun had the power to injure a man by its heat. יוֹמָם is usually a cruel deity to the desert dweller who prefers to travel at night under the benevolent light of the moon. But Psalm 121 in speaking of God's protection says, "the sun shall not smite you by day nor the moon by night" (v. 6). What the nature of this injury might be is unsure. It is the only reference to a possibly dangerous effect of the moon. In all likelihood, it merely serves to complete the parallelism of the verse.

D-2. Laws of the Sun and Moon

As is every object in the skies, the sun and moon are governed by ordinances (חֻקִּים). Each has a regulated path to follow from its place of rising to its place of descent. This natural order may be set aside only by God who established the laws as He did for Joshua (Josh. 10.12-13). Perhaps the best description of the pattern followed by the sun is given in Psalm 19A. Here it is said that the end of the heavens has been set up as a tent for the sun. From it, he rises "from his chupah as a bridegroom and exults like a strong man to run his course." He sets out from one end of the sky and his circuit goes to the other, covering in that period the entire earth (Ps. 19.5-7).

This idea of a habitation for the sun is common in the Bible. We may see it specifically or by allusion (Hab. 3.11; Mal. 4.2; Ps. 75.7; 104.19; 113.3; Job 38.12, 19-21; Eccles. 1.5). The allusions derive from

the fact that the expression for the sun's setting is בא (it "enters" a habitation), and one of the words for its rising is יצא ("coming forth"). The other word for the rise is זרח which means to "shine." A secondary meaning is to "rise" from the appearance of the first rays of the sun shining over the horizon. In fact, the words for sun rise and sun set have come to stand for East and West, respectively. The time and the place for these phenomena are rigidly structured. The sun has a specific time to set: "the sun knows its setting" (Ps. 104.19). Limits are set for light and darkness (Job 26.10). And finally, the eternal repetition of the sun's motion is observed. "The sun rises and the sun sets and hastens to the place where it rose" (Eccles. 1.5). Just how the sun makes its way back to the place from which it will rise is unknown to the biblical authors. In fact, one of the taunts hurled at Job is that he does not know where the light dwells or what its paths are (Job 38.19-21).

One concluding remark should be made. The sun, in all of these verses, moves by the will of God. It is not, as in Greco-Roman and other mythologies, a deity riding in a chariot across the sky. The one possible allusion to such a belief is found in the historical books. There we find that during the reign of Josiah there was a destruction of the chariots of the sun and a removal of those horses who were to be offered to השמש (2 Kings 23.11). This seems to be an idea foreign to the Bible and is found there only.

The moon's motion is also governed by law. We do not find elaborate descriptions such as those we saw for the sun, but the implied facts are plain. The statements that God causes the moon to stand still

(Josh. 10.12-13; Hab. 3.11) imply an otherwise normal motion. And Job speaks of the moon walking (הלך) in brightness (Job 31.26). The laws regulating the moon are usually coupled with those of the other features of the night. So we read in Jeremiah that God ordained that the moon and stars should furnish light by night (31.35-36). This last thought leads us to another idea applicable to both the sun and the moon. These laws which govern the moon and the stars are presented as a picture of permanence, for they are compared to the promised endurance of Israel as a nation (Jer. 31.35-36). This eternity of the ordinances of heaven is frequently stated as a part of the promise by God to Israel to guarantee her long life as a nation in the future (Ps. 72.5, 17; 80.37-38).

D-3. Sun-shine (and Moon-shine)

As the basic function of sun and moon is illumination, it is necessary to examine how this process is carried out. The word " אור " describes the light of these bodies as we saw in the beginning of this section. The hiphil of this verb is often used to describe the body causing light (i.e., shining), e.g., הֵאִיר (Is. 60.19-20; Ezek. 32.7). Another term which describes the shining of the sun and moon comes from the root √זרח (or √זרה). This verb means to "shine" when it appears alone or to "give forth light" in conjunction with אור (Is. 13.10; Job 25.5; 31.26). The stars also give light in this fashion as we shall see. The root √כוכב will be of interest to us as a possible reference to the planet Venus (כוכבה), the planet which

shines most brightly to an observer (Is. 14.12). One other verb, נגה in conjunction with זרח also means to "give forth light." The moon is so described in Isaiah 13.10.

D-4. Eclipses

After studying the light of the sun and moon, it is now time to note those occasions when such light is cut off. As we have seen, God can determine whether or not the lights will shine. Therefore, it is logically within the scheme of things that eclipses are possible. These eclipses are either alluded to in the Day of God (יום יהוה) passages or in general messages of awesome portent. The question at issue here is whether actual eclipses are alluded to or whether we have only a general statement of God's power to do whatever He wills in His creation. Certainly eclipses must have been known in Israel. Lunar eclipses occur on the average of twice a year throughout the world. Solar eclipses are more rare; but during the span of the Bible, we do know that such events did take place which were visible in that area. Through astronomical calculations, we may establish that Israel was witness to solar eclipses on such dates as 31 July, 1063 B.C., 15 August, 831, 15 June, 763, 18 May, 603, and 28 May, 585. All of these are mentioned because they are recorded in contemporary near Eastern literature although there are no direct references to them in the Bible itself.[15] Moreover, it is likely that any reference to an eclipse can be justified as having been derived from an eye-witness account in that total solar

eclipses occur approximately every 18 years (in contrast to the moon's eclipses every six months or so).

Let us now examine those references which appear to describe eclipses one by one. To proceed from the most obscure allusions to the more specific, we find in Isaiah two possible references to both solar and lunar eclipses. The first of these occurs in Isaiah 13.10 where it is said that the sun will be darkened on the Day of God when it rises and "the moon will not cause her light to shine." The next selection speaks of the Day of God's punishment in which the sun will be ashamed and the moon confounded (Is. 24.23). What better way to confound these bodies than to withhold from them their ability to give light? Possibly another eclipse is foretold in Jeremiah when God speaks of bringing calamity to His people. In a possible analogy to the implied eclipsing of Israel, it is said that her sun has descended while it was yet day (Jer. 15.9).

All of the above passages do not supply enough evidence to definitively describe eclipses. Two other selections provide us with more certainty. In an address by Micah which attacks the false prophets, he says that these prophets shall have night so that they shall receive no visions, and "the sun shall go down over the prophets and the day shall be dark over them" (Mic. 3.6). The prophet uses the eclipse as an analogy to the blinding of the false seers. In another incident, when Job curses the day on which he was born, he speaks of the "blackenings of the day"[16] (Job 3.5). Shortly thereafter, there is also a statement about the darkening of the stars (Job 3.9). The stars are often considered to be darkened in passages about eclipses as we will see in additional selections. The book of Ezekiel contains one such passage. The prophet takes a message to Pharoah warning of disaster: "I will cover

the heaven and make the stars dark; I will cover the sun with a cloud and the moon will not give her light. All the bright lights of heaven will I make dark over you and set darkness upon your land" (32.7-8).

The best passages for our purposes are contained in Amos and Joel. One of these again leaves room for doubt. Amos 5.8 speaks of God making "the day dark with night." Amos 8.9 is more direct. The day of God was one which the people considered to be one of vast good. The irony of his message is that this day will bring punishment despite the people's hope. Similarly, one would expect light during the day, but instead: "and it shall come to pass in that day that I will cause the sun to go down at noon and I will bring darkness to the earth in daytime [literally-in the light of day]." Amos, who must have seen the solar eclipse of 763, certainly seems to have seized on the event to drive home his point when he spoke of the יום אור. It is only natural that the awesomeness of the occasion imprinted itself on his mind to be used to provide the analogy for his prophetic irony.

It is difficult to date the book of Joel. Parts of it are very late. Others have been suggested to be pre-Exilic. In general, the book may be ascribed to the fifth century B.C.[17] The vividness of Joel's descriptions indicate that he knew of both solar and lunar eclipses. However, when he saw an eclipse is not that easy to determine. The pertinent verses for us are 2.10, 31, and 3.15. In general, we notice the darkening of the sun and the moon and the withdrawal of the light of the stars. The point which especially attracts notice is contained in 2.31. There, the sun becomes darkened as normally occurs during a solar eclipse. The moon, however, is described as taking on the color of

of blood. We might think that this statement is only a figure of speech having no basis in fact. But just the opposite is the case. When the moon is in eclipse, it lies in the shadow of the earth. The rays of the sun are prevented from reaching the moon directly so that we cannot see that white light which is normally reflected from the moon's surface. A certain amount of light does strike the moon, however. In doing so, it is bent by refraction through the earth's atmosphere. This causes the moon to be a dull reddish color at totality. Even to our modern eyes, the moon seems to have the color of blood! In conclusion then, far from the moon's color casting doubt on the verisimilitude of the Joel verse, it lends support to the fact that Joel must be speaking of an actual eclipse to be able to report it so faithfully.

E. Planets

When we attempt to examine the planets as seen by the Bible, we move squarely into an area of controversy. There are few, if any, direct references to the planets in the Bible. The conjectures are based on passages with uncertain meanings or analogies to the surrounding near Eastern cultures. One of the ground rules that will be observed in this

study is that no textual emendations will be made if it is possible to avoid them. This thought leads directly into an analysis of the word מזלות found in 2 Kings 23.5. It will not be equated with the מזל of Job. The contexts of the two words are not parallel, and to suggest that they are the same word with the ת and ז interchanged raises far more problems than it eliminates. Thus, the מזלות will be studied alone.

The inclusion of מזלות in this section indicates a belief that the word means "planets." The basic reason for this statement is the succession of objects in the verse in 2 Kings. The context is the reformation of Josiah. Under his leadership, a group of idolatrous priests are being purged. These priests have demonstrated their apostasy by offering incense "to Baal, to the sun, to the moon, מזלות ת, and to all the host of heaven." A natural succession of astronomical objects would be: sun, moon, planets, and stars. The unknown word then should be "and to the planets." Moreover, all of the objects, except Baal, contained in the list have a dual nature. To the nations surrounding Israel, the sun, moon, planets, and stars were thought to be deities. This point will be expanded more fully shortly. Baal, of course, is a god. מזלות as "planets" then has an additional claim for justification in that planetary gods played an important role in the near Eastern hierarchy of the divine.

מזלות occurs nowhere else in the Bible in any form. Its possible root √תזל only appears in 2 Kings 23.5. This being the case, we cannot look anywhere in the Bible for hints to the word's meaning. What about the negative side to the argument? There are several prominent suggestions made for the meaning of מזלות. (Remember that

we are not allowing an equation with שדי .) One of these is that the word stands for the phases of the moon.[18] This suggestion makes no sense in the context of the verse nor does it have any ground in etymology. Schiaparelli includes three possibilities: the planets, Venus, and the Zodiac. He favors the idea of Venus. Basic to his argument is the link to שדי which we have rejected. He also insists that Venus was the primary planet for worship - an assumption which will be disputed in discussing the planets in particular. Moreover, when we reach that point, we will find a satisfactory word for Venus, כוכב . He makes an excellent case for the planets which he then ignores. As the argument is similar to the one presented above, there is no need for repetition.[19]

The most widely supported suggestion for the meaning of מזלות is the Zodiac.[20] Rather than examine all of the arguments involved, let it be observed that the concept of a Zodiac is not a simple one. As O. Neugebauer says: "Roughly to the same period, probably the fourth century, belongs also the invention of the zodiac. The constellations which lent their names to the zodiacal signs are, of course, much older. But it was only for mathematical reasons that a definite great circle which measured the progress of the sun and the planets with respect to exactly 30° long sections was introduced. Indeed, the zodiac was hardly ever more than a mathematical idealization needed and used exclusively for computing purposes."[21] His point is that mathematical astronomy, a more sophisticated approach to the science, did not begin until the fourth century; therefore, the concept of a zodiac (dependent on mathematics) could be no earlier. And, as the fourth century is late in the writing of the

Bible, let it also be suggested that the Zodiac plays no part in the Bible at all. Schiaparelli also denies that there are references to the Zodiac on similar grounds.[22] The argument seems cogent. Now, we return to the planets.

What about the individual planets? Five were available to the biblical writers: Mercury, Venus, Mars, Jupiter, and Saturn. The Earth is excluded as a planet in a geo-centric universe, and Uranus, Neptune, and Pluto are visible only through a telescope. As stated earlier, the identification of most of the planets depends on the relating of chance references to the planetary deities of other cultures. One possible exception to this view is כוכב, Venus. Let it be emphasized at the outset that we are in the realm of speculation.

To anticipate a later discussion of idolatry with regard to planetary deities, let it be noted that the book of Jeremiah twice mentions a queen of heaven worshipped by Jewish women. In both cases (7.18;44.17-19, 25), the women make offerings, such as cakes, to the מלכת השמים.[23] It is a practice condemned by the prophet. This מלכת השמים is usually identified with the cult of Astarte (or Ishtar, or whatever her many names may be). And Astarte is associated with Venus, the brightest of the planets. In Isaiah, we have a reference to some bright heavenly being (Is. 14.12-14). The word הילל (√הלל) means "bright" or "shining one." The latter use comes from its conjunction with the sun (Job 31.26) and the heavenly bodies in general (Is. 13.10).[24] Moreover, the verse involved reads: "How you are fallen from heaven, הילל, one belonging to the morning."[25] The obvious "morning star" alluded to is Venus. Now, notice the context

of this verse. It is a denunciation of the ruler of Babylon who will encounter destruction. He (or הֵילֵל) expected to ascend to heaven above the stars of God - to be like עֶלְיוֹן ("the most high"). הֵילֵל must furnish some reference to the king of Babylon if it is to fit into its context. Venus, when the morning star, always rises in the East, preceding the sun. Just as מִזְרַח שֶׁמֶשׁ refers to the East, so Venus here could be an allusion to Babylon which is East of Israel.[26] Alternatively, the verse could be a denunciation of the Venus cult and, thus, be linked to the passages in Jeremiah. However, based on the context, the first guess seems to be the more correct. In any event, הֵילֵל does seem to be Venus.

Another planet which may be directly mentioned in the Bible is Saturn. The dictionaries suggest that כִּיּוּן (Amos 5.26) is Saturn.[27] The Brown, Driver, Briggs definition points out that the word was probably כִּוָּן originally and changed to כִּיּוּן to suggest something "established" or "firm" from √כון .[28] Dr. Julius Lewy, in assigning the word to an Arabic or Syriac root, gives it a similar meaning.[29] As will be shown in a moment, קַיְמָן is also utilized to represent Saturn as the "stable one." Why this emphasis on stability? Dr. Roy Rosenberg suggests in his doctoral thesis that this is due to the rotation [sic - the correct word is revolution] of that planet which takes 29½ years.[30] This would certainly give it the slowest motion of all the planets known to the ancients, the nearest being Jupiter with a sidereal period of 11.8 years. But it still moves and that motion is apparent. Why, then, should stability be ascribed to Saturn? It is because that planet is so far away from the sun that every time the earth makes one complete

revolution about the sun, it needs to continue in its orbit only 13 more days until an observer on the earth would see Saturn in exactly the same position among the stars as the year before. It is for that reason Saturn was known as "the Stable One" among the peoples of the ancient near East.[31]

One should then be on the alert for Hebrew words meaning "stability" for their possible connections to Saturn. כיון is one as we saw above. In contexts, it is referred to as: "the star of your gods" (Amos 5.26); and Saturn is one of the most important deities in the Babylonian divine hierarchy. Another important term is כיס. Dr. H. Lewy in her article, "Origin and Significance of the Magen Dawid," goes into great detail to establish פדעיה as the city dedicated to the Saturn cult. Aside from the name itself, the child sacrifices held there fit in with the near Eastern worship of this planetary deity.[32] However, these and other references which might possibly refer to Saturn lead us astray in that we are concerned with the astronomy <u>per se</u> found in the Bible. Hidden references contained in theophoric names or traces of planetary cults are not in the direct path of this thesis.

For similar reasons, let us only mention in passing, possible references to the other planets. In associating mountains with the gods to whom they are dedicated, Mt. Nebo is identified as the mountain of the planet Mercury.[33] Thus, the two mentionings of this mountain on which Moses died could also be passing references to the planet Mercury (Deut. 32.49; 34.1). Nebo (נבו) is also mentioned as a god, in the company of Bel, who offers his subservience to Israel's God (Is. 46.1). The worship of Nergal (נרגל) by the men of Cuth alludes to the planet

Mars[34] (2 Kings 17.30). And the planet Jupiter may possibly be alluded to with the word כִּיּוּן . Again, questions crop up immediately. Dr. Rosenberg maintains that כִּיּוּן originally referred to the planet Saturn and was "stable,"[35] but at the time of Hezekiah it became identified with Marduk and his planet, Jupiter.[36] To take every כּוֹכָב or כִּיּוּן in the Bible as a reference to a planet is carrying these suggestions too far, however. Let us let the matter rest with the statement that there are few definite references to the planets in the Bible.

F. Stars

We have plentiful references to the stars in the Bible. כּוֹכָב ($\sqrt{ככב}$) means "round," "band," or "circle."[37] Thus, the stars are round points [forgive the contradiction in terms!] in the sky. They are also collected in bands (constellations). כּוֹכָב appears as a single star or as the stars in general. In the creation story of Genesis 1, the stars are created along with the sun and moon as "lights in the firmament to divide the night from the day," and "...for signs, seasons, days, and years" (Gen. 1.14-16). Generally speaking, their function is to give light. Thus, all the heavenly bodies are grouped as "sun, moon, and stars" in most of the verses where they appear. We shall examine this

more thoroughly after pointing out that the primary function of all the heavenly bodies for biblical man is illumination, and only secondarily, to serve as a distinguishing factor in units of time. We have noted this fact for the sun and the moon. We shall now see it with regard to the stars who, along with the moon, rule the night. Most of the verses that we looked at under the section, "Sun and Moon," must now be repeated for the information we may glean from them about the stars and their light-giving power (Ps. 136.7.9; and negatively, in the cutting off of stellar light: Is. 13.10; Jer. 31.35-36; Ezek. 32.7-8; Joel 2.10; 3.15; Job 9.7; 25.5). Indeed, we also have a special reference to the כוכבי אור ("stars of light") which praise God (Ps. 148.3).[38]

The division between night and day is indicated by the appearance of the stars. When they come out (כזה), the night begins (Neh. 4.15). As are the other heavenly bodies, the stars are controlled by ordinances and travel in courses (Judg. 5.20; Jer. 31.35-36). These laws are eternal (Jer. 31.35-36) as the stars themselves are eternal (Dan. 12.3). Not only did our Hebrew see that the stars moved in paths across the sky, he must have been enormously impressed by the number of stars. They were an uncountable magnitude. As such, they are used as an analogy to the future generations of Israel. In this light, we read of the promises by God to the patriarchs and Moses: their seed shall be as the stars of heaven (Gen. 15.15; 22.17; 26.4; Ex. 32.13; Deut. 1.10; 10.22; 28.62). In general, the stars are used as a metaphor for a large number, e.g., the people of Israel (Neh. 9.23; 1 Chron. 27.23) and in the statement: "you multiplied your merchants more than the stars of heaven" (Nahum 3.16).

The word כוכב , then, occurs as a star, as stars, or as the stars of heaven (שמים כוכבי). In the plural, they usually mean all of the host of heaven excluding the sun and the moon. Now, the host of heaven as a Hebrew phrase presents a problem. What are the צבא שמים ? צבא is a term applied to a military troop. From this original meaning, צבא comes to be applied to God's troops: the angels or heavenly beings. Correlative to this is the meaning of צבא as the stars.[39] The צבא in יהוה צבאות will be temporarily set aside. It is the שמים צבא in which we are now interested. Basically, צבא is used to mean all of the heavenly bodies, unless certain ones of them are specifically deleted, e.g., "sun, moon, planets, and all the host of heaven (i.e., stars)" (2 Kings 23.5; cf. Jer. 8.2). The host of heaven are usually described as objects in the sky which will endure as long as the heavens themselves (Is. 24.21; 34.4; 40.26; 45.12; Jer. 33.22; Zeph. 1.5; Ps. 33.6; 148.2; Dan. 8.10; 2 Chron. 18.18). Selections which mention the host of heaven do not necessarily mean the stars, however. The יהוה צבאות are living beings who are counselors of God and praise him. Two selections from the several involved will serve as illustrations. The prophet Micaiah tells Ahab that he saw God on His throne "with all the host of heaven standing on His right and on His left" (2 Chron. 18.18). In the following verses, these hosts speak to one another. Here, the description would suggest that the יהוה צבאות are alive (possibly angels?). We also read of the host seen on high which God brings out by number and calls by name (Is. 40.26). יהוה יהוה צבאות , then, may be either the God who orders the stars or the God

who leads the heavenly troops (or both - or both are one and the same).

This calling of the stars by name serves to guide us into our next major subject. The stars were not known anonymously only. They are named. In particular, noteworthy patterns among the stars are given names by man. As we shall subsequently notice, a part of God's superior knowledge is His familiarity with the names of the stars. But biblical man could call some of these patterns by name, and these are the constellations to which we shall now direct our attention.

G. Constellations

Before commencing this section, it is necessary to recall the introduction to the "Planets." As pointed out there, we are dealing with speculation. It would be next to impossible to prove conclusively that the identifications of the various constellations in the Bible are correct. Indeed, one cannot offer proof positive that the references in question are constellations at all. However, to the additional question which might be raised at this point, i.e., Do differences in time (over 2,000 years) and in latitude (between the United States and Israel) cause any problems in the shape or visibility of the constellations?,

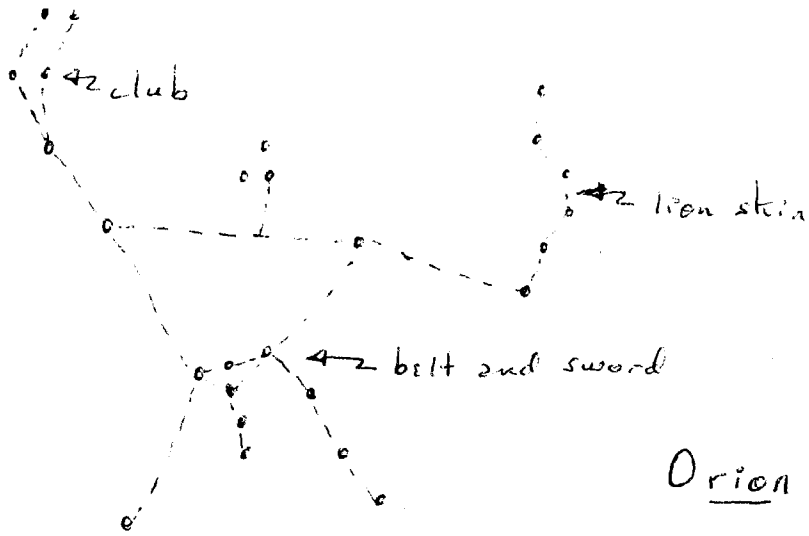
we may offer a firm negative answer. The movement of the stars, and particularly those in question, is not so great that the shape of the constellations was radically different then. Moreover, all of the constellations concerned are visible both to the United States and Israel. The two most important passages for our consideration are Job 9.9 and 38.31-32. In both, the context deals with God's power over nature. Earth, heaven, and sea are all mentioned in close proximity to the "constellations" as will be noted below. Aside from tradition which insists that these are truly constellations, we can also offer in evidence Job 38.33 which is a question about the ordinances of heaven. This immediately follows the listing of the "constellations" and lends support to the idea that they are, according to tradition, constellations. And, as we shall see, traditional interpretations will serve as one of our sources for identification.

Let us first name the four (or more) constellations to be examined: כִּימָה, כְּסִיל, עָיִשׁ (עַיִשׁ), מַזָּרוֹת, and עַיִשׁ כְּסִיל. With each, the procedure will be the same. We will look at the traditional translations. Next, we will study the modern suggestions; and, finally, an attempt at resolution will be made in each case. As might be surmised, עָיִשׁ and עַיִשׁ are to be equated by the similarity of their context.[40] Also, מַזָּרוֹת is to be distinguished from מַזָּלוֹת ("planets") as was explained previously. We shall begin with the easiest and move to the more difficult in the hope that a knowledge of the former will shed light upon the latter.

G-1. כסיל

The word כסיל occurs four times in the Bible (Amos 5.8; Is. 13.10; Job 9.9; 38.31). The Targum translates it as כסיל (כסיל) once and כסילא (כסילא, כסילי) three times. In the Septuagint, we find Ἀρειων and Ἀριωνος ("Orion") for כסיל as well as Ἑσπερος ("Hesper"). Amos 5.8 is omitted. By the time of the Vulgate, we find Orionem and Oriona ("Orion") and Arcturum and Arcturi ("Arcturus") in the verses mentioned.[41] In any event, we do see that כסיל is most often translated as "giant" or "Orion." From the story of Samson, we can point to a biblical example of a mighty man who acted foolishly. Now, the כסיל is found most often in the book of Proverbs where he is one who hates knowledge (Prov. 1.22) or acts in a mischievous fashion (Prov. 10.23). The acts of Samson certainly fall into this category. The link between the "fool" and the "giant" is readily apparent.

Following the general interpretation, as well as the logic of the situation, Orion seems to be a suitable translation for כסיל. The constellation of the giant armed with his club is one of the most obvious in the heavens. The picture is not a difficult one to imagine. And in all of the books used as references for this paper, none suggest anything other than Orion as the meaning for כסיל. It must be admitted that there are other ideas on the subject, but we shall not come across such a complete consensus for any of the other constellations.



Are there additional clues to this identification? For the moment כסיל ׳ כ׳ ס will be set to the side for later consideration (Is. 13.10). Only Job 38.31 provides any information about כ׳ ס other than the simple statement that God made it. Here we read: " מעדות כ׳ס תפתח." Job is asked if he can "loose the bonds of Orion." Theodore Gaster writes in his Thespis concerning the "Poem of Aqhat," that: "In Job 38.31 there is a specific allusion to the 'binding' of Orion ... consistent with the classical myth that, after his resuscitation, Orion was chained to the heavens in the form of a constellation."[42] If we follow another suggestion by Gaster[43] and by Buttenwieser,[44] Job 12.21 is to be translated as: "He poured contempt upon princes and loosed the girdle of the mighty." This, in context, refers to the way that God weakens the power of the strong. By comparison with Job 38.31, we have an indication of God's challenge to Job, i.e., can he weaken the mighty man of the sky, Orion? Thus, מזכיר is to be understood as a "belt" rather than "bonds." In any case, מזכיר still points to Orion.

"Belt" seems to be the more likely interpretation of משכות as it is a prominent feature of the constellation (see illustration). G. R. Driver supports this contention in his suggestion that √משך has the meaning of "grasp." "The משכות will then be so called either as the rope by which a captive may be dragged along or as the belt ... gripping his waist."[45] Moreover, as Cyrus Gordon points out in his article on "Belt-wrestling in the Bible World," Mesopotamian heroes wore wrestling-belts, even when not in combat, to show their status as heroes. In several pictures which demonstrate this fact, we also discover that the aim of certain wrestling contests was to strip off the belt of the opponent.[46] This provides further understanding of why Job is challenged to loosen the belt of Orion.

G-2. כימה

כימה is the constellation mentioned most often after כסיל. It is also always found in connection with כסיל (Amos 5.8; Job 9.9; 38.31). The ancient Versions suggest Πλειάδα and Πλειάδας ("Pleiad") in the Septuagint and Arcturum ("Arcturus"), Hyadas ("Hyades"), and Pleiades in the Vulgate. The Targum merely reads כימא (כימה, כימא, כימתא) which does not offer any assistance. The word is derived from √כום which means a "heap."[47] Thus, as Schiaparelli suggests, the reference is to a "cluster of stars closely packed together... it can refer to no other cluster than that of the Pleiades, which is the best known of these clusters and also the only one which

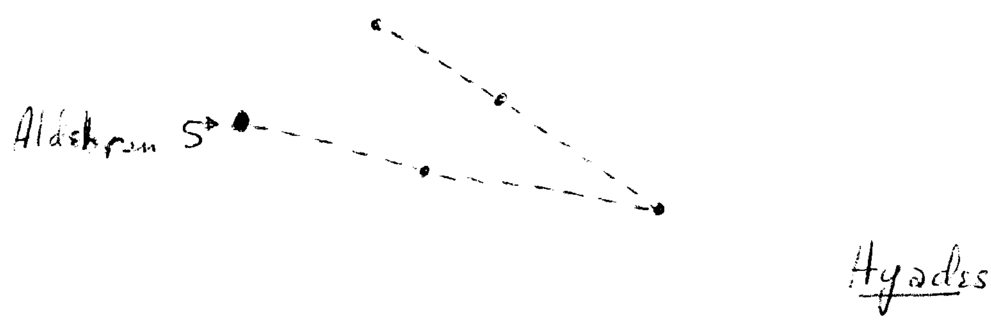
has in consequence of its conspicuous light awakened universal attention at every time and among all peoples."[48]

The Pleiades are a bright cluster located in the right shoulder of Taurus. The stars in it appear closely bunched to the observer. Turning to Babylonian literature, we find that the expression for the Pleiades is "MUL MUL," which means a bundle of stars (ein "Sternhaufen" - star cluster).[49] More will be given on this point later. But what additional information do we have other than the name כִּימָה itself? Again we must turn to Job 38.31 where we read: "הֲתִקְשֹׁר מַעֲדֹנוֹת כִּימָה." This is usually translated as: "Can you bind the sweet influences of the Pleiades"[50] What these "sweet influences" are, and what help they provide in identifying כִּימָה is unsure. Tur-Sinai (as others) suggests instead: "Can you bind the chains of the Pleiades," substituting מַעֲדֵי for מַעֲדֹנוֹת from עָדָה, "to bind."[51] This is more logical and suggests a chain which holds together the "bundle" of stars making up our constellation.

A final point should be made here. We have noticed that whenever כִּימָה occurs, כְּסִיל also appears. A connection between the two is suggested which is borne out by fact. The constellation Orion faces Taurus in which we find the Pleiades. Indeed, the belt of Orion serves as a pointer directing our gaze to the Pleiades.

G-3 עש

Between the Pleiades and Orion on the direct line marked out by the belt of Orion is the Hyades. It too is a bright and well-defined pattern in the sky. In form, the Hyades looks like a V. It, too, is in Taurus.



and forms the head of the Bull. We would expect to find an allusion to this group in the list of bright constellations in the neighborhood of Orion which we have so far established in כימה and כסיל. And, indeed, Job 9.9 and 38.32 offer us the word עש. The word itself means "moth" and is used frequently as such in the Bible. It requires little stretching of the imagination to see the V shape of the Hyades as a moth.

Now, what do the Versions suggest? They do not help much. The Targum suggests עש and גלתא,[52] the Septuagint contributes Ἀρκτοῦρον ("Arcturus") and Ἕσπερον ("Hesper"), and the Vulgate gives Arcturum and Vesperum. Returning to the Hebrew עש, it appears to offer us the best clue with its meaning of "moth."

What about context here? As usual, we turn to Job 38. Here we read in verse 32: " ועיש על בניה תנחם " ("Can you guide עיש with her children," translating תנחם as "guide" from √נחה).

What are עיש ? Do they help us to identify כסיל ? Let us look again at the Hyades as it appears in the sky. Apart from its shape, one fact is presented immediately to our attention. One star, Aldebran, stands out from the rest. It is a reddish, first magnitude star.[53] All of the other stars in the constellation are approximately fourth magnitude. This means that Aldebran seems to be 16 times more bright than the remaining stars which are aptly called the "minor Hyades." This is a possible explanation of עיש and is certainly an apt one for the description in Job 38.32. As to what the "guiding" is, we shall return to this point as we go to the last constellation of our group, the עיש .

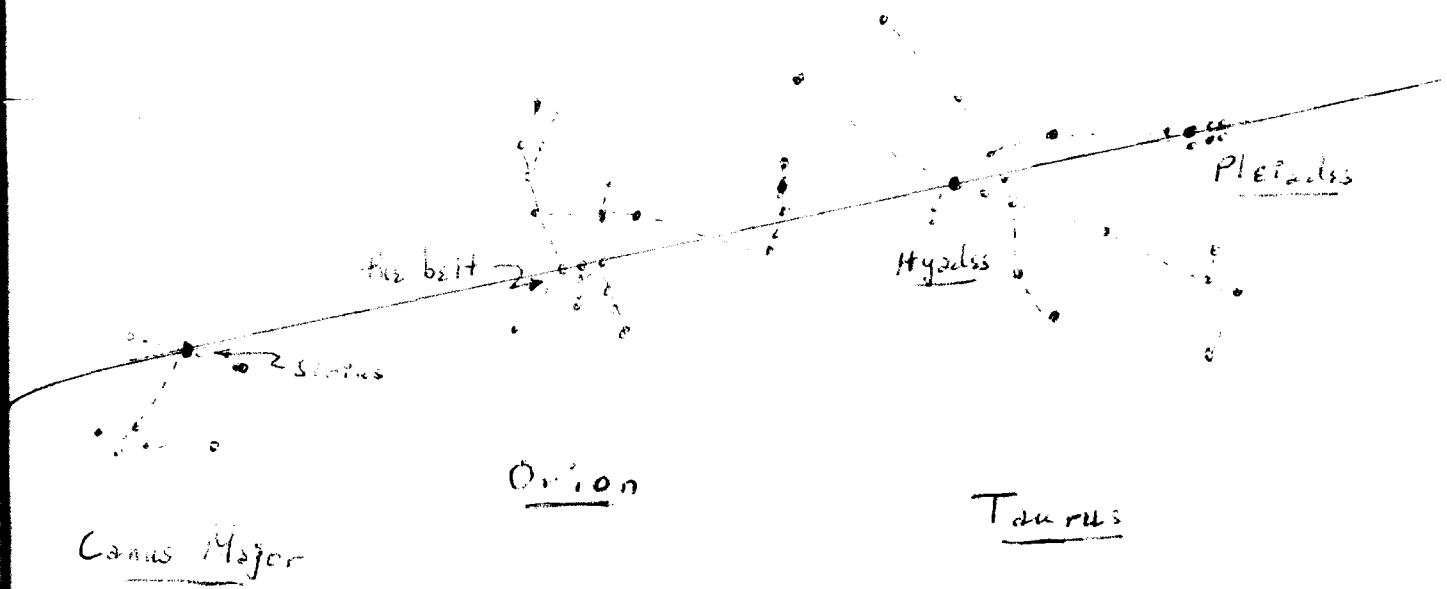
Two last words about כסיל: כ'ל and כסל are usually assumed to be a full and defective spelling of the same word. If this is not the case an interesting possibility occurs. Let us assume that כסל refers to the constellation of the Hyades. In that case, כ'ל is the most prominent star of the constellation and עיש comprise the rest of the Hyades. In equation form this would take the form: כ'ל (Aldebran) + עיש (the minor Hyades) = כסל (the Hyades)! And we may translate Job 38.32 as: "Can you guide the Hyades." We have no parallel examples to support this conjecture, however. In addition, the Hyades is not the only possible constellation to fit the Biblical כסל . Plausible suggestions have been made which identify it with Ursa Major, Leo, and others. Rather than discuss each of these arguments, however, remember that our policy is to only present the most plausible argument and the reasons for its acceptance.

G-4. כימה

Before diving immediately into the question of what the כימה is (or are), it is necessary to briefly review what has been posited so far strictly from an astronomical point of view. Look at a map of the skies, confining this view to the neighborhood of the constellations we have identified to this point. We notice immediately that this area of the heavens contains some of the brightest stars which may be found. The eye is attracted to Rigel (Orion), Betelgeuse (Orion), and Aldebran (Taurus) which are among the ten brightest stars that our Hebrew could have seen when he directed his gaze on high. The most obvious star in this neighborhood has been excluded so far from our consideration; and this star, Sirius, is the brightest stellar object outside of the sun itself. Of course, many bright stars have not been included in our list so that this fact alone is of minor importance.

Now look at the pattern of the constellations. So far we have followed an imaginary line through the belt of Orion to the north which gives us the Hyades and the Pleiades in Taurus. Now extend the line south, and we strike Sirius in Canus Major. Thus, we find a logical grouping of four constellations in the southern sky centering upon the most prominent as a reference point.

Schiaparelli, in quoting M. A. Stein, Die Sternbilder in Hiob, presents an argument to the effect that the primitive Greeks used only four of the bright southern constellations in most of their legends, the Dog (containing Sirius), Orion, the Hyades, and the Pleiades which "are contiguous and form a continuous belt in the sky." Moreover, they were used by the Greeks for the seasons of the year related to agricultural



purposes. Now, the verses in Job 38 immediately preceding and following vv. 31 and 32 also deal with weather.[54] So much of the argument concerns us; the rest goes too far and is ably disproved by Schiaparelli.

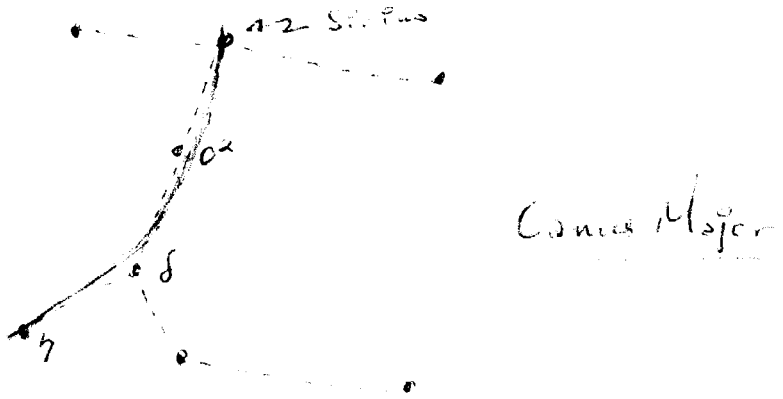
The weather concept is of interest, but the exact dates of the seasons in ancient Israel are too uncertain to build a firm case upon them. A difference of ten or fifteen days in the beginning of the winter rains would serve to change their association with the appearance of one constellation to another. To build somewhat on the argument stated above, let us examine the rising of these constellations.[55] During the summer, none of the groups with which we are concerned may be observed since they are below the horizon. By autumn, Taurus first makes its appearance.

In the winter and spring, all of our constellations are visible. They appear in the East and slowly move higher in a westerly direction as the year progresses. First come the Pleiades, then the Hyades, Orion, and Canus Major in that order. All of these constellations, the brightest ones of the winter sky, are seen on the western side of the great stellar highway, the Milky Way.

November is the month for the appearance of the Pleiades. It also marks the beginning of the rainy season and winter in Israel. We might also identify this season with the Hyades; but, in any event, there is a general correlation. The last of the rains occurs in April or May. This coincides with the setting of Orion and Canus Major. Further than this, we will not push the argument. Identifications have been made to associate all of the groups with the advent or ceasing of the rains, the flooding of the Nile, etc. But the question must be left as being uncertain. Let the matter rest with the idea that such a connection is valid. Thus, it seems that God's question to Job in chapter 38 is whether Job can control the weather by, e.g., weakening the influence of Orion. More of this later.

To come to the point which is not being made too subtly, physical considerations lead us to posit a group of four constellations: Orion, the Pleiades, the Hyades, and Canus Major. Job 9.9 and 38.31-32 also list four constellations. To stay with Job 38 at this time, it seems that the task now is to see if כסיל may be equated with Canus Major (or Sirius) rather than to find a meaning for כסיל and then try to see if some star or constellation will fit that meaning. Ancient versions of the Bible give us no help. When we turn to Babylonian astronomy,

we find no constellation called "dog."[56] What was identified with Sirius was a bow. This bow, the Babylonian term for which is KAK. SI. DI, is made up of Sirius itself, Canus Major α^2, δ or η.[57]



Now, the problem is to link מַשְׁמַר to a "bow" without forcing the meaning excessively. Several explanations have been given for מַשְׁמַר One of the common suggestions is to derive it from the Akkadian "massartu" ("guard"). Tur-Sinai is one who makes this suggestion. He points out that the "ṣ" (like a "צ") becomes a "ש".[58] This idea is attractive because, at first glance, one could make a case for the guard of Orion being his watchdogs (Canus Major and Minor). Since the dog has been rejected, however, "guard" makes no sense and gives us no constellation which would be appropriate. Moreover, G. R. Driver comments that the Babylonian "ṣ" and the Hebrew "ש" are not interchangeable. In consequence, he rejects the meaning of "guard."[59] Other possibilities include " מִזְמַר " for " מִשְׁמַר " with the "ז" and "ש" exchanged. This we, as others, have already rejected. The root √זמר also presents possibilities and consequent difficulties. For an attempted solution, we turn again to Driver who offers a derivation from √שמר . "That this word is derived from the √ZR ... is grammatically fully

justified; for an original מזלות may have become מזלת exactly as מאכלת has become מאכל 'food' from אכל 'ate.' The Heb. זלל 'girded,' which comes from a common Semitic root, can then be the source of a derived מזלות > מזלת 'engirding; girdle;' and this is a highly suitable name for the Zodiacal system."[60] Others have suggested the Zodiac as a translation of מזלות for reasons which were not as good. But the Zodiac has been excluded from the Bible for reasons already stated.

What does the girding refer to then? Frequently in the Bible, when men dress (or gird) themselves for war, a part of the process is to take bow (קשת) in hand. Thus, we read in the song of Hannah in the book of Samuel: "The bow (קשת) of mighty men are [sic] broken, and those who stumbled are girded (חגרו) with strength" (1 Sam. 2.4). The parallelism of the verse suggests a close connection between the "girding with strength" as contrasted to the undoing (ungirding) of the mighty men by breaking their bow. Other selections describe men preparing themselves for battle by girding (√חגר) themselves and taking up the bow (2 Sam. 22.35 and 40 = Ps. 18.33 and 35; Is. 5.27 and 28). When we use another word for girdle, we read that when Jonathan strips himself to provide accouterments for David, he even gives up his sword, bow, and girdle (חגורה - 1 Sam. 18.4). Also observe that the expression "to draw a bow" is " קשת דרך " (1 Kings 22.34; cf. 2 Chron. 18.33; Is. 66.19). Keep this in mind as well as the כסיל of Orion.

Now, this connection, admittedly not too strong, is but the first arrow in our quiver. The second is taken from Gaster's attempt to link

the myth of Orion to that of Aqhat in his book, Thespis. He observed that: "The theme of the myth is ... not only the death and (apparent) resurrection of the huntsman but also the loss and (apparent) recovery of the bow."[61] Thus, we are given an additional reason for a link between the Bow[62] and Orion, one of our first three constellations. And logically, one would expect our mighty man who is girded with the מושכות which Job is challenged to loosen to have a bow ready to hand. The very choice of " מושכות ," an unusual word for belt (usually אזור , חליצה , or חגורה , indicates the possibility that a bow is somewhere present, as indeed it is in the words immediately following the מושכות כסיל , and in the sky with the conjunction of Orion and the Bow. The מזרות then is that which girds Orion along with his belt and club, i.e., his bow.

One last word about Job 38.32 in particular. We read: " התציא מזרות בעתו " ("Can you bring forth the Bow in its season"). The בעתו should meet the question that might arise from the plural form of מזרות (which we have emended to מזרת) if such a question still exists.[63] בעתו also indicates that the appearance of מזרות is seasonal. It is not a constellation which can be seen throughout the year. And finally, התציא furnishes us with a parallel to חדרי which we left open in the discussion of עש . These constellations are brought onto the heavenly stage (יצא) by God and led along established routes from East to West in the southern sky (חדרי).[64]

G-5. חדרי תמן

Job 9.9 contains a list of constellations similar to that of Job 38. Some important differences exist, however. The listing of the former chapter is a simple enumeration; the latter contains some information about each constellation. Furthermore, the order of the list in Job 38 follows the actual appearance of the stars with the single exception of עש which is added to the list at its conclusion. Job 9.9 gives us עש (second in order to rise), כסיל (third), כימה (first), and חדרי תמן. And, of course, חדרי תמן is not the same word as מזרות . Again, the Versions offer no assistance in an effort to decipher " חדרי תמן." The usual translation is "chambers of the South." Little criticism may be brought against the meaning other than that it does not tell us very much. We may have to be satisfied with that suggestion, however, and try to pass it off by saying that the other three constellations are in the South; therefore, חדרי תמן refers to all of the other constellations in the southern sky which are of lesser import.

This possibility does have a certain appeal, especially when we digress for a moment to bring up the question of כסיליהם which is now appropriate. Isaiah 13.10 reads: "כי כוכבי השמים וכסיליהם לא יהלו" ("for the stars of the heaven and כסיליהם shall not shine"). Two translations are offered: "their Orions," "their constellations." Brown, Driver, and Briggs suggests "their Orions" and explains the verse by saying: "Orion and other constellations of the same brilliance."[65] Koehler-Baumgartner offers: "Orion and its constellations."[66]

With all of the previous discussion in mind, the latter translation is to be preferred although both are possible. Orion is easily the dominant constellation in the southern sky. As a consequence, our group of four could be logically identified as "Orion and its constellations." This passage in the book of Isaiah, which singles out Orion and its constellations from among all the stars of heaven, lends further support to our belief concerning the identification of the constellations in Job and their being chosen for mention there.

With the above paragraph in mind, it would not be inappropriate to say that כסיל וכימה is to be associated with עש בנות. The problem is that two of the three constellations identified with Orion are already mentioned in the verse. An important one is missing. And as to supposing that additional minor constellations are included in the כסיל וכימה, the idea is possible but a slim possibility at that because the rest of the stellar groups in the South are neither important nor obvious. We cannot completely reject the suggestion, but it would be profitable to seek another answer. As Job 9.9 and 38.31-32 are a list of individual constellations with the only possible exception being the כסיל וכימה, it is worth while to investigate the possibility of its being the name of a specific star group.

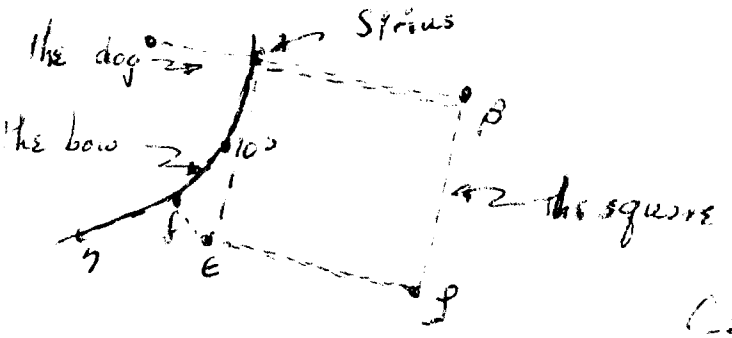
Many suggestions have been offered. The one most plausible has been made by Dr. H. Lewy in a personal discussion of the question. She refers to Weidner's Handbuch der Babylonischen Astronomie: "Text VAT 9416, section BI, ll. 1-4 describes these stars as follows: the constellation Ikû (i.e., "square") which stands where the east-wind rises 'blocking the road to the south,' this constellation is the star of the beginning

of the year; it is the captain of 'those of Ea' (i.e., the southern stars)." She points out that "חדר" is found to mean "square," and its form is found in a Babylonian Ziggurat which is dedicated to the square (חדר) of Ea. The Babylonian heavens were divided into three parts, each under the rule of a god. The Great Square in Pegasus forms an obvious square in the northern sky. It is her position that a similar square must exist in the South to correspond to this. She finds this square in Cetus, with the prominent star, Mira Cetus, included.[68]

The basic difficulty here is that the other stars which are needed to complete the figure of the "square" are anything but prominent. These stars are β and ν Cetus and an unnamed star. ν Cetus is fifth magnitude; the unnamed star is so because it is sixth magnitude. Now, the sixth magnitude is considered to be a cut-off point for visibility. Only under exceptional circumstances can such a star be seen by the naked eye. Most stellar maps do not even include this particular star unless a telescope is suggested for use with the map. Even assuming this star was visible, the square formed by the stars in Cetus would certainly not be one which is obvious in the portion of the sky belonging to Ea.

A square is a figure which can be frequently found in the sky. Thus, חדרי תמן as the square of the South would have to be especially noticeable. If we return to our guide, the belt of Orion, and follow it south in pursuit of a square, we may easily find one. Look again at the drawing of Canus Major. A bow was the suggested figure seen by the ancients. However, we are not limited by the fact that the stars are imagined in the shape of a bow. Ursa Major is not only the Great Bear as its name implies; our Western eyes have come to see it as

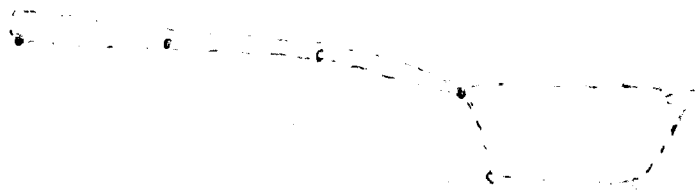
the Big Dipper. The two figures are not congruent. In the stars of Canus Major, we find an obvious square. And later ages saw a dog in



these stars! To return to the square, however, the stars β, ε, and ζ Canus Major and Sirius itself furnish us with the figure needed. ζ Canus Major is third magnitude; β and ε are second, and Sirius is the brightest star in the sky (-1.58 magnitude). Thus, we have a square, to which we are led naturally, which contains stars bright enough to attract attention.[69] נגב עשׁ can then be satisfactorily translated as "the square of the South" (the portion of the sky belonging to Ea) or "the square to the south of Orion." In conclusion, if נגב עשׁ is truly one constellation and not several of them, it would seem that the square based on Sirius is the logical nominee for the position. Moreover, this would provide a complete parallel to Job 38 and complete the group of four constellations suggested in the preliminary statements on כסיל.

H. Questionable Passages

Are there any other passages in the Bible containing astronomical references? The answer is obviously yes. Each one of them presents its own difficulties which would involve considerable time to analyze. However, it would be profitable to look at them on the surface at least. As we have been examining the constellations, it would seem reasonable to stay with them at this point. Schiaparelli finds in Job 37.9 another constellation. In his comments on the מִן־חֶדֶר תָּבוֹא סוּפָה, he says that חֶדֶר of Job 37.9 is that place from which the south wind issues. As a contrast, the cold is said to come from the מְזָרֶה. He takes this word to be formed from √זָרָה and, with a change in the pointing, comes up with מִזְרֶה. Since the hot whirlwind comes from the South,[70] the cold wind must logically originate in the North. The most obvious constellations associated with the North are Ursa Major and Minor, the latter including the pole star.[71] As זָרָה means a winnowing fan, מְזָרֶה would lead us to a pair of such fans in the sky. The Big and Little Dipper easily qualify for such a form. Indeed, the picture is more obvious than one of a bear. Thus, he concludes that מְזָרֶה



Ursa Major

(the two winnowing fans) are Ursa Major and Ursa Minor.[72] The argument is clear and there seems to be no reason to dispute it.

For those who would find dragons or Leviathan in the sky, it must be pointed out that such constellations represent an attempt to fill the entire heavens with figures. Presently, our sky contains 88 constellations. In the fourth century B.C., the mathematician Eudoxus described all of the constellations then recognized - some 44 in number. A Greek poet, Aratus, has preserved this list for us in one of his poems, The Phenomena, written in 270 B.C.[73] The early Greeks had many vacant areas in the sky. Long, winding figures such as serpents represent an attempt to fill these vacancies and can be considered to be from a time later than the Bible. So far, remember, we have only succeeded in identifying six constellations mentioned by the Bible. As attractive as it might have seemed, the Rahab myths shall have to be excluded from consideration for their astronomical value is nil. Such selections as Job 26 which deals with God's battle with Rahab (cf. Is. 27.1; 51.9; Ezek. 29.3; Ps. 89.11) may be reflections of earlier myths, but they do not deal with figures placed in the sky as the result of a titanic struggle.

It would be worthwhile to state a general principle at this point. There is a major difference between having an elaborate mythology and, in attempting to see these creatures in the sky, making stellar configurations accord with such pre-conceived ideas; and the observance of obvious figures in the heavens and simply naming them. To illustrate: כִּמּוֹן means "a heap." The Pleiades (or Seven Sisters) are the representation of an elaborate legend. The former is merely a name for an obvious star cluster; the latter represents the finding of the same

cluster, notingthat seven stars made up the group, and callingit the Pleiades. The Bible contains the obvious constellations and gives them descriptive names; "heap," "big fool," "moth," "bow," "square," and "winnowing fan." This is why serpent forms are to be excluded. It is also why Taurus was not found to be known in the Bible whereas the Hyades and the Pleiades (obvious forms within Taurus) were.

Amos 5.9 could also represent a list of constellations. This verse is a difficult one to translate. With the use of emendations, we may read: "המבליג שר על עז ושר על מבצר יביא." Setting aside for the moment our prejudices against emendations, and the fact that the above emendations cause the verse to be awkward in its context, what do we now have? "Who [speaking of God's control of nature supposedly] causes the Zodiac to rise- ox (Taurus) following on goat (Aries), and to set - ox following on מבצר (a star in Virgo)."[74] Technically, this list is correct for the rising and setting of objects in the Zodiac. But again, our comments about the Zodiac apply here as well as the statement concerning Taurus. Moreover, Aries and Virgo are not obvious constellations. Driver has identified מבצר as Vindemiator, but again this would not particularly catch the eye and is a star rather than a constellation.[75] We have dealt with constellations only. For these reasons, Amos 5.9 must be excluded from our further consideration with one more comment. It is necessary to mention Driver's other suggestion about the verse, i.e., עז is Capella, a star in Auriga.[76] Capella is a brilliant first magnitude star. It is also near Taurus (if we allowed for Taurus). Amos 5.9 would then contain two stars (Vindemiatrix and Capella) and a constellation (Taurus) with one of the

stars not being anywhere near Taurus (Vindemiatrix). And Auriga would not fit the order of rising of constellations as well as Aries. Why Capella for עיש ? Mythologically, Capella represents the she-goat which suckled the infant Jupiter. Therefore it is known as "the goat." But this is not biblical mythology nor would it influence the Bible. Again, Amos 5.9 must be rejected.

As for other astronomical phenomena which may be found in the Bible, let us move systematically. Genesis 15.17 tells of a תנור עשן ולפיד אש ("a smoking furnace and a lantern of fire") in connection with the covenant of the pieces. A reference to meteors burning in their descent might be found here. Joshua 10.11 speaks of God casting "great stones from the heavens" upon the fleeing enemy as well as hail stones ("אבני גדלה מן השמים"). Joel's יום יהוה also indicates the possibility of meteors as well as eclipses and earthquakes (Joel 2.1-11). And finally, in the Psalms, we read of God's anger which causes upheavals of the earth, storms, darkness, and flaming stones (Ps. 18.7-16.) The evidence is not conclusive, but the awesome appearance of a flaming meteor as it burns and even explodes in the sky is indicated. Certainly, the amber color of brightness in the midst of fire is an apt description of a meteor in Ezekiel's fantastic vision (Ezek. 1.4).

Amos 5.6 and Zephaniah 1.5 refer to מלכם which, in context, appears to be a deity of some kind, possibly a planetary one, but which one it is, is unclear. The obvious god is Moloch. The astronomical value of the two verses is little. Ecclesiastes 12.2 speaks of a span of time "while the sun (השמש) or the light (האור) or the Moon (הירח) or the stars are not yet darkened...." What is האור ?

It cannot be a heavenly body other than those listed. The order of the verse does not tell us much as וְאֶת separates the sun and moon which usually appear together. The latter part of the verse deals with lights of the night sky; the first may speak of lights of the day especially as the sun is mentioned. But what else appears during the day? The only possibility would be the moon which does appear in the day at certain times of the month. But this is obviously the moon. Probably, it merely refers to the fact that all of the objects in the verse are light-givers.

Last, we come to the book of Daniel. In the second section of the book, we read of a vision in which the prophet sees the Ancient of Days on His throne garbed in white. "A fiery stream issued and came forth from Him; ten thousands ministered to Him and ten times ten thousands stood before Him" (Dan. 7.10). This stream of God's attendants could possibly be an allusion to the Milky Way. The conclusion is somewhat far-fetched. Daniel 8.8-10 speaks of the ram's horn which ascends to the host of heaven and casts down some of the host. A reference to Aries would be attractive if we had not already rejected it. The lateness of the passage in Daniel, however, could suggest that a fuller picture of the heavens was known by this time so that previous statements concerning Aries are now invalid. If such is the case, the ram mentioned could well be Aries. As the context is a fanciful vision, we can learn little of the biblical astronomy from it.

I. Conclusion

We conclude this portion of the thesis which dealt with the brute astronomy of the Bible. We have seen that our Hebrew was aware of the obvious events in the skies. He knew the major heavenly bodies and could pick out some of the constellations. He was aware of a repeated pattern, or law, of stellar motion. Where did this knowledge come from? And, more important, what purpose does it serve in the Bible?

Chapter 2 - Influence of Neighboring Lands Upon Israel

When we examine the totality of the passages in which astronomical references are made, we find that one important fact emerges. By far the majority of verses involved were written in the post-Exilic period. Job, of course, is customarily dated around 400 B.C. Much of the astronomy of the Bible is found in that book. If we accept Buttenweiser's dating of the Psalms, we find that the bulk of the Psalms which contain stellar allusions are post-Exilic. The astronomical references of the book of Isaiah are mostly those which are found in that part of the book known as III Isaiah or some writer who lived after the Babylonian Exile. The point seems clear. Before 587, the Bible contains little astronomy; after 538, the opposite is the case - relatively speaking, since there is not that much astronomy in the whole of the Bible.

The Jews seem to have acquired their notions about the heavens somewhere. Such ideas do not appear in vacuo. Now, the astronomy of the Bible is basically simple observation of the events of the heavens, as has been pointed out previously. But a certain amount of sophistication is present which does not seem to be original with Israel. From whence came the astronomy? The evidence indicates Babylonia. Before exile to that country, the Jews did not refer to astronomical events in their Bible. After the Exile, they did so. Moreover, the Babylonians were the great astronomers of the age. Before the Greeks entered the stage of history, the Babylonians were scientifically systematizing their knowledge of the heavens. Mathematics was used as a tool in this task.

O. Neugebauer is a leading figure in the studies of this subject. He points out that as early as 700 B.C. in the "mul apin" texts, we have a summary of the astronomical knowledge of the Babylonians. "Around 700 B.C., under the Assyrian empire, we meet with systematic observational reports of astronomers to the court. ... In these reports no clear distinction is yet made between astronomical and meteorological phenomena.[77] ... It is very difficult to say when this phase developed into a systematic mathematical theory. It is my guess that this happened comparatively rapidly and not before 500 B.C. ... Mathematical astronomy is fully developed at 300 B.C. at the latest."[78]

The Jews came into contact with Babylon at a time when that country's astronomy was in the process of development. This we can see by our description of the astronomy in the Bible. It is the result of observation, not yet that of calculation. The Jews acquired many ideas in Babylonia. Some of them they consciously rejected; others they unconsciously retained. It will be our contention that astronomy falls into the latter category. And astrology, that sister to astronomy in this early Babylonian science, falls into the former category.

A. Astrology

What is astrology? It is the idea that the stars somehow control life on earth. The sky has seasons in the appearance of various constellations which correspond to the seasons of the earth. This coincidence can be interpreted as influence. The movement of stars in the sky controls the movement of the seasons upon the earth. From control, this simple astrology leads to a deification of those heavenly beings which rule such an important part of life on earth. Planets also take their place in this picture because they move rapidly (speaking relatively) through the constellations. Their appearance in a particular constellation heralds whatever event the astrologer seeks to find. In the more complicated astrology of a later day, it is the planets' wandering through the Zodiac which is of particular interest to its practitioners.

Now, when we look at the pattern of deification in the ancient near East, we notice that the first gods were usually weather gods. These deities later became stellar gods. Thus, Enlil, the storm god, was also the god of the central part of the sky. This pattern is not present in the development of all deities to be sure. However, the pattern is informative. Astrology was employed to learn from the gods what would happen on earth. And Israel, too, made use of this pseudo-science inherited from its neighbors. Judaism has long been both an innovating and a syncretizing religion. In close contact with her neighbors, Israel could not have avoided being influenced by them.

This influence we may observe by noting some of the theophoric names in the Bible. The name יכניה (1 Chron. 4.26) is derived from the old West Semitic sun-god, יכן , and means "the sun is god."[79]

More prominent is the derivation from Šalim (Saturn). The city of Jerusalem is that city dedicated to the god which is the planet Saturn. David's sons, Absalom and Solomon, also take their names from the divine protector of the city.[80] But does the use of these names mean an allegiance to the particular gods concerned? It is possible but somewhat doubtful. In today's world, Mr. Kaufman does not think of his ancestor, the merchant; Mr. Schwartz is usually unaware that his name means "black"; and Mr. Fletcher has little knowledge that one of his distant relatives made arrows. Michael, unless he knows Hebrew, has not the slightest idea that his is a theophoric name - מִיכָאֵל. Names are given for many reasons - to honor parents, current popularity, and their association with renowned figures. Their origins are usually forgotten and play no part in the naming process. Thus, we may suspect an influence because of the Babylonian theophoric names, but not necessarily a devotion to the gods of that country.

Similarly, Israel was influenced by Babylonian astrology. The Jews may have consciously rejected such ideas (as we shall contend), but they were definitely influenced by them. Certainly the prophets found it necessary to condemn both the astrologers and those who followed them. It is obvious that the book of Jeremiah would not contain a warning to the people that they should not learn the ways of the heathen nor fear the signs of heaven unless such a present condition existed (Jer. 10.2). II Isaiah also challenges astrology, e.g., his presentation of God's challenge to the astrologers to foretell the future and save the people: "let your astrologers, stargazers, and monthly prognosticators stand forth and save you ..." (Is. 47.13). It is worthy of note that this

passage is Exilic with the assumed date of II Isaiah at that time. Moreover, the Jeremiah passage is also thought to show the influence of /II Isaiah[81] and would also have to show the strong Babylonian influence (and here, threat) of the Exile.[82]

Thus, our point is that astrology did influence the people of Israel. However, this influence plays no great role in the Bible. Indeed, all we find in the Bible are scattered protests against astrology. There are no recommendations to favor such a study or descriptions of its methods. But, if the Bible shows no inheritance of overt astrology, what may we say about astronomy?

B. Astronomy

We have pointed out that the astronomy of the Bible is basically an observance of the obvious physical facts of the universe. Its study was important in Babylonia because of its primary role in astrology. Astrology has a purpose - to foretell what will happen to man and his environment; astronomy supplied the information from which astrology could predict. A science usually has a specific purpose before developing in the abstract. Geometry provided important information about land

boundaries before it was developed into a "pure mathematics." A "pure science" need have no relation to the world as we observe it. All that is demanded is a self-consistency within the game. But this comes after the development of the science in the first place.

Judaism may have rejected astrology, but it was willing to accept the "pure science" which was a part of it. The Bible had no reason to reject Babylonian astronomy. But again we face the question, Did Judaism take over the developing astronomy of Babylon or does the Bible present a science solely developed within Israel? Schiaparelli feels that there is little or no connection between the countries and their astronomies. He points out, as his basic argument, "the deeply significant fact that of the five or six names of constellations occurring in the Old Testament, not one has hitherto been recognized among the numerous names of constellations found on the cuneiform inscriptions."[83] The study of the near East has progressed considerably, however, since Schiaparelli's time. The Pleiades (כִּימָה - Hebrew = MUL MUL - Babylonian = "heap"), for one, disproves his allegation.

Does all of the Hebrew astronomy derive from Babylonia, to go to the opposite extreme? Not necessarily. In a course in biblical history that I had several years ago, a professor (Dr. Samuel Iwry) pointed out that questions of originality are often misleading. In a comparison between the code of Hammurabi and the casuistic law of the Bible, we find many similarities. This does not mean that one is necessarily a derivative of the other. To use a modern analogy, look at the traffic laws of our day. Any of the countries which has traffic problems also has laws to contend with those problems. Are French traffic laws derived from Italian ones because, after all, they are remarkably similar? No. All

we may say is that two countries faced with similar traffic conditions enacted similar laws. So it was with the casuistic law of the Bible. In agricultural or pastoral countries, similar laws were enacted for similar conditions. It would be difficult to prove that one set of laws is derived from another.

The Pleiades appear to the eye as a heap or cluster of stars. To say that כימה is derived from MUL MUL or vice versa is to suggest more than can easily be proved. Suffice it to say that the simple astronomy of the Bible could easily have been developed without the influence of Babylonia. However, a stay in Babylonia (the Exile), where there was a greater concern for astronomy than in Israel, spurred the interest of the Hebrews. Moreover, it was not the study of astronomy so much that was excited, but the use of astronomical terms in common speech. The Hebrew had a new set of similes to use in writing the Bible. Thus, the power of God could be seen not only in His creation in general, but in His control of stellar phenomena in particular as we shall later demonstrate. By way of analogy again, a man may eat coffee and rolls for breakfast all of his life; but only after a trip to Europe does this meal become a "continental breakfast." What was familiar in the past becomes elevated to special prominence in the present with the addition of a dressier term! A rekindled interest in astronomy now provided the biblical authors with a richer language for describing the natural world.

Chapter 3 - God and the Heavens

What then is the purpose of the astronomy in the Bible? The Jews, in rejecting astrology, denied the Babylonian purpose of the science. They found it useful in enriching their language, e.g., in the praise of God. The magnificent God of nature was the God who controlled, among other things, specific stellar events. In Psalm 148, for example, all of creation is called upon to praise God. Included in the specific features of the world are the sun, moon, and stars (Ps. 148.1-6). The Psalms, as a whole, call upon the heavens to praise God, as we saw earlier. This serves as one of the functions of astronomy. Are there any others? And specifically, do the features of astronomy play any special role not given to other objects of nature? It is our contention that in rejecting astrology, the Bible implicitly rejects idolatry; and that the concept of the heavenly bodies moving in regulated paths under God's law reflects the development of monotheism in the Bible.

Ludwig Köhler notes this in his Old Testament Theology. "It is only late and gradually that heaven acquires significance ... in the Old Testament. The title for Jahweh, 'the God of heaven,' 2 Chron. 36:23 = Ezra 1.2, Neh. 1:4, 5; 2:4, 20, Jonah 1.9, is apologetic and polemic. It is addressed to an age which saw divinities in sun, moon and stars, the chief luminaries of heaven. The same purpose is served by the expression: Jahweh is God in heaven above and upon the earth beneath, Deut. 4:39, Josh. 2.11. It makes clear also that 'in heaven' indicates a sphere of influence more than a habitation. ... It is likewise apologetic and polemic when it is claimed expressly and vigorously that God

made the heavens: Ps. 33:6; 96:5; 102:25; 136:5; Neh. 9.6; 1 Chron. 16:26; Prov. 3:19. The heavens which are made are a created thing, not an independent being and certainly not a divinity. ... And on account of the variety of these expressions, ... one may doubt whether the statement that heaven is God's habitation - one may doubt whether this statement says anything about God at all or whether its real purpose is not to take from heaven its claim to divinity by asserting that it serves to house God."[84]

In brief, the argument is that the God who creates the heavenly bodies is superior to them and to any possible claims to divinity which they may possess. Now, we may define two stages in theology. They are polytheism and monotheism. A system in which we have the worship of many stellar deities of similar rank may be termed polytheism. If any of these deities, or an outside god, is elevated to a position where he rules the other gods, or the other gods are manifestations of one god's overlordship of the world; we have a form of polytheism which we shall call henotheism.[85] Monotheism, to the contrary, is the worship of one god only and the absolute denial of the existence of others.

The struggle of the biblical authors to move from polytheism, where the God of Israel was one among the gods, to monotheism is reflected in the astronomy of the Bible. Henotheism is a way-station in this movement. The Bible frequently speaks of other gods. The prophet Elijah is presented in a pitched battle between himself and the prophets of Baal (1 Kings 18.17-46). The battle is symbolic of the struggle between God and Baal. When Elijah's God wins the contest, it proves that

He is superior to Baal. It is not until the time of Jeremiah and II Isaiah that the other gods are considered to be no gods at all. Jeremiah states that such gods are לא אלהים , "no gods"[86] (Jer. 2.11; 5.7). II Isaiah brings the concept of universal monotheism to its greatest flowering in saying the יהוה alone is God, and it is He who created the heavens and the earth (Is. 41.28-29; 42.17; 43. 10-11; 44.7-8; 45.5-6, 14-17, 21-22; 46.1-2, 8-11; etc.) Isaiah 40.25-26 sounds the keynote for our theme. "To whom shall you liken Me and to whom shall I be compared - says the Holy One. Lift up your eyes on high and see who created these, who brings out their host by number; He calls them all by name in the greatness of His might...." Not even the stars can be compared to God. In a context where other nations believed in stellar deities, this statement not only denies their power but their very existence.[87]

Henotheism occurred in other lands. The Babylonian planetary god, Saturn, is the embodiment of the universe as we read in the hymn to Ninurta. The deified astral phenomena are represented as parts of the body of Ninurta and act as executors of the divine will.[88] This is an example of what we are calling henotheism. Another god who controls the stars is found in the Akkadian Creation Epic:

> "ASHARU, who, as is his name, guided the gods of destiny;
> [...] of all the gods is verily in his charge.
> NEBIRU shall hold the crossings of heaven and earth;
> Those who failed of crossing above and below,
> Ever of him shall inquire.
> Nebiru is the star (Jupiter) which in the skies is brilliant.
> Verily he governs their turnings, to him indeed they look,

Saying: 'He who the midst of the Sea restlessly crosses,

Let "Crossing" be his name, who controls its midst'."[89]

This too is henotheism - lesser deities looking to a superior deity.

The Bible also speaks of God controlling the heavens as we have mentioned earlier. His control, however, manifests God's sole power in the sky. This is more than henotheism; it is monotheism. The stars are the creation of God. They are not gods in their own right.[90] What distinguishes the biblical conception of God's controlling the universe from the accounts of other peoples? We have a clue in Psalm 97. "For all the gods of the peoples are idols (אלילים - nothing[91]), but God made the heavens." (Ps. 96.5) The contrast establishes that the stellar deities are "no gods" (אלילים) for it is the one God who made the heavens. It is God's creation of the universe which sets the tone for the Bible's understanding of the phenomena of astronomy. When God is spoken of as the ruler of the heavens, He is also said to have created them, e.g., "I have made the earth and created man upon it; I have stretched out the heavens by My hand and commanded all their hosts" (Is. 45.12). And, in Jeremiah, we read that Israel is to tell the nations that God is the creator. "Thus you shall say to them [what follows is in Aramaic - so that "they" will understand?]; the gods did not make heaven and earth, they shall perish from the earth and from under the heavens. [continuing now in Hebrew] He [God] made the earth by His power ... and stretched out the heavens" (Jer. 10.12-13). These verses appear in a context where the heathen are pictured worshipping the signs of heaven (Jer. 10.2).[92] To further multiply examples: "You, You are יהוה alone, You have made the heavens ... and all their host ...

and you sustain all of them ..." (Neh. 9.6);" ... and He is to be feared above all gods. For all the gods of the people are idols, but יהוה made the heavens" (1 Chron. 16.25-26); and finally, "They [the heavens] shall perish, but You will endure ..." (Ps. 102.26).

By the act of creation, יהוה is distinguished from the gods of other peoples. He is not a supreme deity who controls other gods (henotheism); rather, He is a God who created the world and, by His creation, rules the world. This is a monotheism. This is the argument implied in the statements made by the biblical authors when they ascribed the act of creation to God. It is not only a polemic against polytheism, in general, it is a flat denial of henotheism as well. There is no room for any gods besides יהוה in the astronomical descriptions contained in the Bible.

This polemic also appears in specific attacks. Psalm 104 bears a strong similarity to the Egyptian "Hymn to the Sun of Ikhnaton." Buttenwieser maintains that the two poems differ in their nature. "Our analysis, then, of the points of contact the psalm has with the hymn shows that there is not a single instance of mere copying but rather that the psalmist has assimilated whatever he appropriated from the hymn and has recast it to serve his own purpose."[93] The important contrast which is made lies in the following argument: "... in the Egyptian hymn the sun is deified, is described as the force behind all forces, ... in the psalm the sun is looked upon as the handiwork of God, whose will it must obey like all other forces of nature."[94] The conclusion which we may draw at this point is that we have a specific instance of henotheism versus monotheism. The recasting of the hymn as a Psalm is a pointed

denial of the sun-god. To amplify Dr. Buttenwieser's point, then, and to go beyond it, it is our contention that Psalm 104 is not just a remembrance of the "Hymn to Ikhnaton" recast by the Psalmist, but a deliberate reworking of that hymn to make it clear that יהוה is the only God. The hymn begins with an address to Aton,[95] "Thou living Aton"[96] - the sun. The Psalm is addressed to יהוה, "Bless the Lord, O my soul" (v. 1). Both describe the actions of the deity in nature until we reach a description of the sun itself. The hymn says, "when thou settest in the western horizon the land is in darkness."[97] - a description of sunset. The Psalm says, "You [God] make darkness and it is night." (v. 20). In other words, when Aton is absent, the land is in darkness; but God is the one who causes the sun to set and makes the world dark. Control passes from the sun to its maker who is always present. The sun, in the Psalm, is only another one of God's creations, not a god in its own right.

To examine another instance of this type of polemic, we turn to Morgenstern's analysis of Psalms 8 and 19A. He observes that the two Psalms, especially 19A, show the traces of an earlier mythology but that they now represent the offering of praise to God. The mythological element, among other topics, deals with a deified sun.[98] The mythology is again transformed. To return to the creation motif, while remaining with Dr. Morgenstern's article, we find a discussion of how the book of Psalms presents the theme of creation. In an analysis of Psalm 136 where we read of the God of gods who alone created the heavens by His plan, he notes: "This statement ... that He is the supreme, divine being, is of more than passing significance. It seems to have a polemic value, as if it were refuting the claim that there might be other gods

besides Him or to be compared to Him, by pointing to the creation of the wonderful universe and emphasizing that He created it by plan or supreme intelligence alone and unaided."[99]

We have so far examined the various ways the Bible uses astronomy as one of its tools to establish that יהוה is the sole God against any claimants to divinity. It must be admitted that the Bible also shows a strong trace of solar worship - despite the polemics presented above. Such passages as the consecration vision of Isaiah (Is. 6) and the dream - visit of Ezekiel to the Temple in Jerusalem (Ezek. 8-11) are illustrative of the probably worship of שמש in Israel. This theme is developed fully by several scholars. It is not our purpose here to describe the nature of the sun-cult in the Bible. We are interested, however, in how this cult was undermined and reworked so that שמש is deprived of his divinity to become merely a tool of the true God. In so doing, we will see the most prominent example of how יהוה took His place in the heavens as the sole and supreme God.

As a basic reference for this subject of solar worship, we shall use Dr. Morgenstern's The Fire upon the Altar. The sun-god in the Bible is often referred to as the כבוד יהוה . " ... I have discussed the k^{e}bôd Yahweh in considerable detail and have endeavored to show that originally it was the first rays of the rising sun upon the morning of the fall equinoctial day, the New Year's Day of the solar calendar, shining directly in through the eastern gate of the Temple at Jerusalem...."[100] The כבוד יהוה here, then, is the radiance of the sun-god. However, in later biblical writing, e.g., Isaiah 60, which we shall present below, the כבוד יהוה is

deliberately distinguished from the sun, in effect making ρΝΕ a mere part of the natural order under the control of God.

Can we mark a point where this change takes place? To do so, we turn again to Dr. Morgenstern. Ezekiel 43.1-7 and 44.1-2 describes the events to take place in the newly consecrated Temple. In particular, the))/)) ' ʒ/ר כ will return to dwell within it permanently, "It is self-evident that Ezek. 43.1-7; 44.1-2 is endeavoring to inaugurate, as a distinct innovation, the concept of the permanent dwelling of the Deity in the form of the k^{e}bôd Yahweh within the Temple. ... Furthermore, it is clear that the authors of Ezek. 43.1-7; 44.1-2 are standing at the very beginning of that stage of the evolution of the concept of the k^{e}bôd Yahweh by which the original solar elements inherent in the representation of the k^{e}bôd Yahweh as the first rays of the rising sun ... were gradually suppressed until at last the theological principle that the deity in the form of the k^{e}bôd Yahweh, a radiant, fiery apparition, had taken up permanent residence within the sanctuary ... had acquired definite and realistic form and expression. In the Ezekiel passages the solar origin of the concept ... are still plainly manifest. In fact, the picture of k^{e}bôd 'e$_{l}$ôhê Yisra'el coming from the East and lighting up the earth with its radiance as it moves westward is the most realistic representation of the rising sun that can possibly be imagined."[101]

From this first attempt to separate the)) /)) ' ʒ/ר כ from the sun, we move to Isaiah 60. There we see that the)) /)) ' ʒ / ר כ will replace the sun as a source of light. And indeed, this new light will not be strictured by the bonds of night and day. "Arise, shine,

for your light will come and the glory of the Lord (יהוה כבוד) will rise upon you ... The sun (שמש) shall no longer be light by day for you ... for the Lord will be an everlasting light" (vv. 1-2, 19-20). Here the יהוה כבוד is clearly not the sun, and the sun itself is merely one of God's creations. There is an interesting cycle that is revealed here. In the first creation story of Gensis, we read that the divine light of the first day was replaced by two great lights - the sun and the moon - on the fourth day (Gen. 1.3-5, 14-16). In this eschatological passage from the book of Isaiah, the process is to be reversed. The divine light will again shine in place of the sun. One last passage will serve to conclude this thought: Isaiah 30.26 says that in the hoped-for future the light will be like the days of the creation.[102]

One final note concerning the de-deification (to coin a term) of the sun. Psalms 8, 19A, and 104 are dated by Morgenstern and Buttenwieser as pre-Exilic. Their polemical nature, then, was to combat a real situation existing in Israel. It is not until the Exile, and after, that we finally may dispose of the sun-god. With all this evidence in, we may add yet one more point. The section on "Eclipses" serves to show that God rules the sun and removes any thought of possible vestiges of divinity remaining to שמש.

In concluding this chapter, we may note that in the biblical condemnation of idolatry and attempt to establish monotheism, we have suggestions as to what the people are doing. They were worshipping (copying their neighbors) all of the hosts of heaven, including sun, moon, planets, and stars (2 Kings 17.30;[103] 21.3, 5; 23.4-5; Jer. 7.18; 8.2;

44.17-19, 25; Ezek. 8.16; Zeph. 1.5). That is the reason for specific prohibitions of this practice and the recognition that יהוה alone is God (Ex. 20.3-5; Deut. 4.15-19; 5.8; 17.2-3). To take one example, Deuteronomy 4.15-19 contains a prohibition of images "lest you lift your eyes to the heavens and see the sun and the moon and the stars, even all the hosts of heaven, that you be driven to worship them and serve them ..." (v. 19). God's relation to the heavens is that He alone is God, He is the יהוה צבאות - the Lord of hosts who rules the stars; and through His creation and control of the heavens is derived the maxim the Bible announces: "Hear, O Israel, יהוה, who is our God (henotheism), is the one Lord (monotheism)" (Deut. 6.4).

Chapter 4 - Man and the Heavens

So far we have considered the relation of God to the heavens. What is the purpose of astronomy vis a vis man's relation to the heavens? It is a reflection of man's attempt to find his place, as well as the place of his particular God, in the universe. The development of a monotheistic position, which we have discussed, established the Hebrew's God as the sole ruler of the universe. Concomitant with God's superiority to any heavenly bodies comes a קל וחומר argument. If God not only knows and understands the ways of the heavens, but also established them; how much more is He superior to man who only is a fraction of creation, has a limited knowledge of the heavens, and exercises no control over them whatsoever. By ascribing this position and power to God, man sets up a relation between himself and his deity. In his study of the skies, he comes to a partial understanding of their ways and of himself. He, thus, ascribes their laws to a superior being.

Let us repeat: when man beholds the heavens, he sees the glory of God. As a result, he knows his place in the universe and his relation to his God. This is not an eisegesis; the Bible makes the same point explicitly.

"O Lord, our God,
How glorious is Thy name in all the earth -
Thou whose majesty is reflected in the skies!
Out of the mouths of babes and sucklings hast Thou founded strength
To refute thine enemies, to silence unbelievers and doubters.
When I behold the sky, the work of thy fingers,

The moon and the stars, which Thou hast created;
I reflect, What is man that Thou art mindful of him,
Mortal man that Thou heedest him?
Yet Thou hast made him but little lower than God,
And hast crowned him with glory and majesty."

(Ps. 8.1-6[104]).

Here we have it all. In answer to those who would doubt - either God's place in the heavens or man's relation to that structure - one need only view the skies. Man may have dominion over the earth (as the Psalm goes on to say); but no matter how he may be exalted by God, he remains mortal. The heavens belong to God. Man beholds them with awe and reverence. Whenever he might be tempted to challenge God, he may be reminded of his place by a warning to look at the sky. It is in this context that we may now turn to the book of Job.

In, perhaps, no other place in the Bible can we see the position of man made so clear by astronomical references as in the book of Job. Psalm 8 was pre-Exilic (<u>cf</u>. p. 71). Job comes after the Exile. It was written at a time when astronomy was most prominent in the Bible. It takes the absolute power of God for granted. Thus it is ideal for our examination of the biblical view of man's relation to the heavens, and, therefore, to God. Job cries out in his agony -- how can man contend with God? (Job 9.2-3). The question is set up by chapter 9 of the book. God's power is seen in His shaking of the earth, commanding the sun, controlling the heavens and constellations - who can say to him, What doest Thou? (Job 9.4-12).

Nevertheless, it is the boldness of Job that he challenges God.

He refuses to believe that he is being punished for his sins. He seeks to strive with God if only he could. As "comforter" after "comforter" speaks with him, he rejects them all. Eliphaz understandsJob to be questioning the ability of God to know what is happening on the earth because He is too far removed. The "comforter" expresses this by asking: "Is not God in the height of the heavens? and behold the height of the stars, how high they are! And you say, How does God know?" (Job 22.12-13). Eliphaz then answers his own question by maintaining that God does know what is happening in the world, therefore Job should reconcile himself with his creator (Job 22.21-30).

But Job is not satisfied with such answers. Finally Elihu comes to contend with him. Whether or not this portion of the book is original, the responses to Job's questions are still pertinent to our presentation. Elihu also tells Job that he does not have the right to say that God is punishing him unjustly. He tries to awe Job with God's majesty and greatness. "Behold, God is great and we know it not (we cannot truly understand His greatness)" (Job 36.26). After recounting God's power as seen in nature, he tells Job to "Hearken to this, O Job; stand and consider the wonderful works of God" (Job 37.14).

Evidently, Job is still not satisfied for now God must intervene in the controversy. One of the problems in the study of the book of Job is that no answer is given to the question of theodicy brought up by the book. No matter how carefully the final answer - that of God to Job - is studied, no definitive statement is found with regard to the question of good and evil. Many interpretations have been offered, up to and including Archibald MacLeish's J. B. in which divine love is the answer.

The idea that Job must simply be content with the fact that he will receive no answer seems to be closest to the real meaning of the text. This idea is the argument that man cannot know the ways of God but must simply accept them. The righteous shall abide in his faith! But there is more to God's speech out of the whirlwind than this. Otherwise, the speeches of the three "comforters" and Elihu should have been sufficient. No, God's speech is to overwhelm Job. It is for this reason that these final words are put into the mouth of God. And the nature of the argument supports this contention.

God begins by saying:

"Who is this who darkens (denies) counsel
By words without knowledge?
Gird up your loins like a mighty man
For I will demand of you, and you shall answer Me.
Where were you when I laid the foundations of the earth?
Declare, if you have understanding! (Job 38.1-4)

Question after question pounds upon the rash creature who dared to contend with God. He is first warned to prepare for the fray. Then God begins the attack. Astronomy plays a principal part in the argument. Let us now return to Job 38.31-33. After questioning Job about the weather, and especially about rain, God asks:

"Can you bind the chain of the Pleiades
Or loosen the belt of Orion?
Can you bring forth the Bow[105] in its season
Or guide the Hyades[106]?
Do you know the laws of heaven

Or set its rule upon the earth?"

In this context, the specific question here seems to be: Can Job control those constellations whose appearance herald the beginning of winter and the rainy season? And the implied thought in the background is that God can and does do so. Here we are presented with a realm which is God's alone as we saw in Psalm 8. But the overwhelming of Job only begins here. From the stars, which are admittedly under the aegis of God and not man, we move to the earth which is supposedly under man's dominion. In Psalm 8, we saw the view that the earth was given to man. This is a reflection of Genesis 1.28-30. Yet, here God tells Job that he is not even master of his own world! He summarizes by returning the challenge to Job: "Shall he who contends with Shaddai (the Almighty) reprove Him?; he who reproaches God, let him answer Him" (Job 40.2). And Job can only reply: "Behold, I am too weak, how can I answer You? I lay my hand on my mouth ... I will proceed no further" (Job 40.4-5). But God is not content to end the contest here. He continues with the argument; He forces Job to go on. He asks if Job has power like God, and He offers an analogy of those proud beings who did attempt to strive with the Almighty (Job 40.8-41.34). God is not satisfied with a demonstration of Job's weakness; He must settle the issue completely. And, utterly routed, Job can only say in defeat, "I know that You are able to do anything and that no plan can be withheld from You .... Therefore I abhor and repent (all which I have said)" (Job 42.2-6).

The objects of astronomy have played an important role in this contest between God and Job. They served to emphasize the vast difference between the opponents. The purpose of astronomy in the Bible, then, is to accentuate the difference between man and God. This is a complement

to the emphasis on monotheism shown in those passages which contain astronomical references.

There are also certain lesser uses of astronomy of which we should be reminded here. One of these is its use in similes in connection with such concepts as God's promise of long life for Israel. Indeed, this particular simile is one of the major functions served by astronomy in this way. A sense of permanence is given to man and to Israel through the order and law of nature. One selection will illustrate this point already made: "So says the Lord, If My covenant is not with day and night, if I have not appointed the ordinances of heaven and earth; then I will also cast off the seed of Jacob and of David My servant ..." (Jer. 33.25-26).

The last function of astronomy to be summarized is that of calendation. The subject itself is a vast one and could easily be the topic of another thesis. A few comments may be made here to highlight earlier statements made on this subject in chapter one. The sun and the moon mark day and night. The moon also serves to determine the length of the month as we will remember from the comments on the words " חדש " and " ירח ." The question of a solar calendar or a luni-solar calendar is a big one and can be found in many writings on the topic. The stars also indicate the night, as well as certain seasons of the year. Our discussion of the constellations illustrated their purpose in marking seasons of the year.

In conclusion, we turn again to the classic text on astronomy in the Bible by Schiaparelli: "It would ... be incorrect to suppose that the Jews were indifferent to the facts of nature, that they paid no

attention to the spectacles provided by her in such marvelous variety, or that they made no attempt to offer any kind of explanation of them. On the contrary, in every part of their literary remains their profound feeling for nature rises to the surface; and it is manifest how open was their mind to acute observations of phenomena and to admiration for all that is beautiful and impressive in them. Their explanation of natural events (as far as it is still possible to trace it in the indications, fragmentary and often uncertain, which are scattered in chance references in the books of the Old Testament) seems to us, as always happens with primitive cosmologies, much more fantastic than rational; yet it was not so exclusively a work of the imagination as to degenerate into arbitrary or unbridled mythology, ... It was connected exclusively with the worship of Yahwe: to His omnipotence the Jews referred the existence of the world; they made its changes depend on His will, ... Hence they gained the foundations of a simple and clear cosmology, in perfect accord with religious ideas, ..."[107]

Not only did the astronomy accord with the religious ideas of the Bible; but, as we have tried to show, it played a part in the development of those ideas. The heavens are an impressive sight even in our sophisticated age. To study them, to learn their ways is the exciting task of astronomy, a science. To be inspired by them, to find a beauty and awe in their magnificence brings us to religion. Even though we separate these two areas, as we should, in our own time; we can understand the blend found in the Bible. We can understand and sympathize, for who among us would not attribute the laws we are discovering in the heavens to God who made them all? The man of the biblical age jumped directly

to this conclusion. We come to it in a more round-about fashion. But the concept of universal monotheism developed in the Bible is very much the same for us today.

Footnotes

1. Cyril H. Powell, The Biblical Concept of Power, p. 10f.

2. In addition to the references listed, there is, of course, the creation story itself in Genesis 1-2.

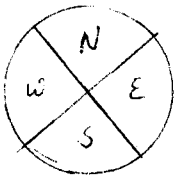
3. Amos 9.6 contains the word אֲגֻדָּתוֹ which may also refer to the vault of the sky. שָׁמַיִם is also used for heavens in certain passages of the Bible. Job 37.18 has it in connection with רָקַע as a verb. Psalm 89 uses שַׁחַק twice for heaven (vv. 7 & 38). The most frequently used words, however, are שָׁמַיִם and רָקִיעַ.

4. Ludwig Köhler, Old Testament Theology, p. 152f.

5. Giovanni Schiaparelli, Astronomy in the Old Testament, p. 31f.

6. Job 37.18, cf. note (3) above, does not use the noun רָקִיעַ, but the verb form תָּרְקַע in connection with שָׁמַיִם in referring to the firmament.

7. A quadrant is a fourth of a circle.



e.g. A wind from the North is one which originates in the north quadrant.

8. If we make the textual emendation often suggested, Isaiah 19.18 may also contain the word חֶרֶס (change ס to ש) and refer to a city of the sun (Heliopolis).

9. זֹהַר is derived from זָהַר and could also mean "shining" or "radiant."

10. Francis Brown, S. R. Driver, and Charles A. Briggs, A Hebrew and English Lexicon of the Old Testament, p. 1055.

11. In dating the Isaiah verses, refer to Sheldon H. Blank, Introduction and Notes to the Text of Isaiah, pp. 41, 54.

12. The Gezer Calendar suggests that יָרֵחַ is to be linked with an old (about 925 B.C.) agricultural calculation of the months. Each line begins with יְרֵחוֹ, and the year is divided into nine seasons containing one or two months each giving a total of twelve. The Calendar is translated by William F. Albright in Ancient Near Eastern Texts, James B. Pritchard, ed., p. 320.

13. It will be remembered that the moon is to be considered a source of light, not a reflector. The latter concept arose considerably later.

14. Brown, Driver, Briggs, op. cit., p. 177.

15. E. W. Maunder, The Astronomy of the Bible, p. 120f.

16. Tur-Sinai suggests that "the context requires that the Hebrew expression כמרירי יום, too, should convey an idea of darkness, and not of bitterness, which alone could be associated with מרירי, without the initial כ. This letter, therefore, is not to be understood as kaph of comparison, in any of its usages, as suggested by the punctuation כְּ, but as a radical part of the noun כמרירי, meaning something like '(forces) blackening out the day,' e.g., in solar eclipse, from כמר, which in Syriac means both 'to burn' and 'to darken, blacken' ..." - N. H. Tur-Sinai, The Book of Job, p. 54.

17. Suggested by Dr. Sheldon H. Blank.

18. Ludwig Koehler and Walter Baumgartner, Lexicon in Veteris Testamenti Libros, p. 509; cf. Ernst Müller, "Astronomy," Universal Jewish Encyclopedia, p. 571f.

19. Schiaparelli, op. cit., pp. 74-88.

20. Koehler and Baumgartner, loc. cit.; Brown, Driver, and Briggs, op. cit., p. 561; Müller, loc. cit.; Maunder, op. cit., pp. 243-255.

21. Otto Neugebauer, The Exact Sciences in Antiquity, p. 102.

22. Schiaparelli, op. cit., pp. 74-79.

23. The text reads מְלֶכֶת. The usual translation of the "queen of heaven" assumes the Hebrew reading מַלְכַּת.

24. Brown, Driver, and Briggs, op. cit., p. 237; Koehler and Baumgartner, op. cit., p. 235.

25. בן שחר is translated on the analogy of בן בקר, a calf - one belonging to the herd (Gen. 18.7).

26. It must be observed, however, that the East in the Bible usually refers to Elam. Our suggestion is based on the fact that Babylon is east of Israel and could be the allusion here. Another interpretation is suggested by Dr. Hildegard Lewy. In an analysis of the taunt song contained in Isaiah, she emends הילל to read אהולל (with the א from the previous word שמים) which is a fool or insane person. בן שחר is related to the belief that members of the Assyrian royal family were descended from the goddess Ishtar, and בן שחר means "son of Ishtar." This would give us: "How you are fallen from heaven, O insane one, son of Ishtar" and be a definite reference to Nabu-na'id, king of Babylon. But this requires an emendation which we are trying to avoid. It seems that our explanation serves the purpose of

identification more simply and without changing the text. See Hildegard Lewy, "The Babylonian Background of the Kay Kâûs Legend," Archiv Orientalni, XVII/2, p. 97.

27. Brown, Driver, and Briggs, op. cit., p. 475f.; Koehler and Baumgartner, op. cit., p. 433.

28. The pointing might also be derived from the vowels of שִׁקּוּץ ("abomination"). In this case, שִׁקּוּץ stands for the view that idolatry is an abomination. Such words which denote idolatry often take this form in the Bible. - William R. Harper, "Amos and Hosea," International Critical Commentary, p. 139.

29. Julius Lewy, "The Old West Semitic Sun-God Hammu," Hebrew Union College Annual, XVIII, p. 445f., n. 147.

30. Roy Rosenberg, Some Aspects of the Canaanite Cult of Jerusalem in Judaism and Christianity, p. 6.

31. The discussion of this name is taken from Hildegard Lewy, "Origin and Significance of the Magen Dawid," Archiv Orientalni, XVIII/3, p. 332.

32. Ibid., pp. 330-365.

33. J. Lewy, op. cit.,p. 459; H. Lewy, "The Babylonian Background of the Kay Kâûs Legend," p. 48.

34. Ibid.

35. Rosenberg, op. cit., p. 20.

36. Ibid., p. 90.

37. Brown, Driver, and Briggs, op. cit., p. 456f.

38. The stars, along with the other heavenly bodies, also have the task of singing God's glory (Job 38.7).

39. Brown, Driver, and Briggs, op. cit., p. 838f.

40. This emendation follows all of the sources used in writing this thesis.

41. It is to be noted that on the chart contained in Schiaparelli's book, in which these various forms are listed, there are considerable contradictions and confusions among the possible translations of the names of these constellations. However, they do serve as a starting point. Schiaparelli, op. cit., facing p. 53.

42. Theodore Gaster, Thespis, p. 322.

43. Ibid., p. 201 n.

44. Moses Buttenwieser, The Book of Job, p. 110.

45. G. R. Driver, "Two Astronomical Passages in the Old Testament," Journal of Theological Studies, 7/I N.S., p. 4.

46. Cyrus H. Gordon, "Belt-wrestling in the Bible World," Hebrew Union College Annual, XXIII/1, pp. 131-136 and plates facing p. 136.

47. Brown, Driver, and Briggs, op. cit., p. 465; Koehler and Baumgartner, op. cit.,p. 434.

48. Schiaparelli, op. cit. p. 62.

49. Franz X. Kügler, Sternkunde und Sterndienst in Babel, Ergänzungen, p. 151f.

50. cf. The King James Version.

51. Tur-Sinai, op. cit.,p. 531. Let this presumed metathesis be another of our accepted emendations.

52. Pleiades ? - Schiaparelli, op. cit., facing p. 53.

53. Magnitude is a term used to refer to the apparent brightness of a star as seen by an observer. The scale of magnitude is 2½ per division with lower numbers signifying the brighter stars.

54. Schiaparelli, op. cit., p. 165f.

55. Not all of the constellations can be seen at one time. As they emerge above the horizon due to the earth's canting in its orbit, they are said "to rise."

56. We have not used Taurus as a constellation because its form is not as obvious as are the other constellations discussed. Similarly, Canus Major does not look so much like a dog that it would be obvious to our Hebrew viewing the stars.

57. Kügler, op. cit.,pp. 156f., 201; cf. Alfred Jeremias, Handbuch der Altouientalischen Geisteskultur, p. 129; and Gaster, op. cit., p. 322.

58. Tur-Sinai, op. cit., p. 531f.

59. Driver, op. cit., p. 6f.

60. Ibid., p. 5.

61. Gaster, op. cit.,p. 326.

62. Gaster also identifies Sirius with the constellation of the Bow. - Ibid., p. 322.

63. Of course, כסיל should go with a masculine singular noun. But כסלת (fem. sing.) is in better agreement with כסיל than is כסלות (fem. pl.).

64. It is interesting to speculate on a further interpretation possible here of Job 38.31b and 32a. In 31b, Job is challenged to weaken Orion by loosening his belt. 32a might refer to the opposite: Can Job strengthen Orion by providing him with (bringing out for him) his bow?

65. Brown, Driver, and Briggs, op. cit., p. 493.

66. Koehler and Baumgartner, op. cit., p. 447.

67. Ernst F. Weidner, Handbuch der Babylonischen Astronomie, p. 76. Actually, Weidner does not contain the quotation. It is Dr. Lewy's correction of this book in her handwritten notes that supplies the necessary bringing up to date of the material in Weidner.

68. Mira Cetus is a prominent star because it is a variable. At its brightest, it reaches the second magnitude. 331 days later, it is invisible to the naked eye. It dwindles to tenth magnitude and can only be seen through a telescope. A star which appears and disappears would certainly attract the eye and wonder of an observer.

69. The rectangle of Orion is even more prominent than the square in Canus Major, but it is too elongated to be considered a true square.

70. Although Schiaparelli finds a different southern stellar group than the square of Canus Major, both of our constellations are notably in the South. Therefore, we find no objection to his argument at this point.

71. The position of the stellar North Pole has moved slightly due to the motion of the earth. However, it is not far now from its position then, and we may safely call today's Pole Star the same in the Bible.

72. Schiaparelli, op. cit., pp. 67-72.

73. Robert H. Baker, Introducing the Constellations, p. 4.

74. cf., Harper, op. cit., p. 117.

75. Driver, op. cit.,p. 1. Vindemiator is ε Virgo, Vindemiatrix, 6/4 times less bright than Spica which is the dominant star in the constellation.

76. Ibid.

77. As we saw in the Bible even at a much later date - M.A.

78. Neugebauer, op. cit., p. 101f.

79. J. Lewy, op. cit., p. 434, n. 39, cf. p. 473.

80. H. Lewy, "Origin and Significance of the Magen Dawid," pp. 331-334.

81. Sheldon H. Blank, Introductions and Critical Notes to Jeremiah, p. 25.

82. The astrologers in Daniel have been deliberately omitted because they are a phenomenon of the king's court and were not directly in contact with the Hebrew people.

83. Schiaparelli, op. cit., p. 21.

84. Köhler, op. cit., p. 153.

85. Normally, henotheism is defined as the worship of one god with the acknowledgment that others exist. For the purposes of this thesis, we have created an operational definition of henotheism which accounts for the description given and distinguishes it from polytheism in general.

86. אלילים is translated as "no gods" from its meaning of אל, אלה as "nothing" and is a disdainful term for foreign gods or idols. -- Koehler and Baumgartner, op. cit., p. 53. A possible alternative to this translation is "godlets"-so Dr. Sheldon H. Blank.

87. Although we are not examining rabbinical texts in this thesis, one Midrash is particularly interesting at this point. We earlier saw the use of astronomy in praising God. A midrash on Psalm 19 shows how this praise also serves to demonstrate God's power. "'The heavens recount the glory of God' (Ps. 19.1) - Rabbi Jacob ben Zabdi gave a parable of a mighty man who entered a province whose inhabitants did not know his strength. A wise man said: 'You will know his strength from the size of the stone that he lifts.' Similarly, we learn the strength of the Holy One, blessed be He, from the heavens." - The Midrash on Psalms, 19:6.

88. H. Lewy, "Origin and Significance of the Magen Dawid," pp. 354-356.

89. Translated by E. A. Speiser, in Ancient Near Eastern Texts, Pritchard, ed., p. 72.

90. cf. the שרי פרת which govern the heavens, pp. 11, 17-19.

91. cf. n. 86.

92. cf. Abraham Heschel, The Prophets, p. 240.

93. Moses Buttenwieser, The Psalms, p. 161.

94. Ibid., p. 159.

95. In Pritchard's Ancient Near Eastern Texts, the word Ikhnaton does not appear. Instead, it has Akh-en-Aton ("he who serves Aton"). Thus the hymn is a hymn to Aton, the god, by Ikhnaton, "the one who serves the god."

96. Translated by John A. Wilson, in Ancient Near Eastern Texts, Pritchard, ed., p. 370.

97. Ibid.

98. Julian Morgenstern, "Psalms 8 and 19A," Hebrew Union College Annual, XIX, pp. 491-516.

99. Ibid., p. 519.

100. Julian Morgenstern, The Fire upon the Altar, p. 7.

101. Ibid., p. 13f., cf. Julian Morgenstern, "The Cultic Setting of the 'Enthronement Psalms,'" Hebrew Union College Annual, XXXV, p. 1-42.

102. Lecture by Dr. Sheldon Blank.

103. cf. n. 23.

104. Translation taken from Buttenwieser, The Psalms, p. 177f.

105. Remember that the Bow is the constellation formed from our modern Canus Major.

106. Or "Aldebran and the minor Hyades," cf. p. 39.

107. Schiaparelli, op. cit., p. 1f.

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