# Astronomy in the Bible



No systematic observations of the heavenly bodies were made by the Jews. Astral worship was rife in Palestine, and they could hardly have attended closely to its objects without yielding to its seductions. Astronomy was, under these circumstances, inseparable from astrolatry, and anathemas of the prophets were not carelessly uttered. As the most glorious works of the Almighty, the celestial luminaries were indeed celebrated in the Scriptures in passages thrilling with rapture; but the appeal to them for practical purposes was reduced to a minimum. Even the regulation of times and seasons was largely empirical. The Jews used a lunar year. It began, for religious purposes, with the new moon next after the spring equinox, and consisted normally of twelve months, or 354 days. The Jewish calendar, however, depended upon the course of the sun, since the festivals it appointed were in part agricultural celebrations. Some process of adjustment had then to be resorted to, and the obvious one was chosen of adding a thirteenth, or intercalary, month whenever the discrepancy between the ripening of the crops and the fixed dates of the commemorative feasts became glaringly apparent. Before the time of Solomon, the Jews appear to have begun their year in the autumn; and the custom, revived for civil purposes about the fifth century B.C., was adopted in the systematized religious calendar of the fourth century of our era.

Both the ritual and civil day commenced in the evening, about half an hour after sunset. Its subdivisions were left indeterminate. The Old Testament makes no mention of what we call hours; and it refers to the measurement of time, if at all, only in the narrative of the miracle wrought by Isaias in connection with the sundial of Achaz (2 Kings 20:9-11). In the New Testament, the Roman practice of counting four night-watches has superseded the antique triple division, and the day, as among the Greeks, consists of twelve equal parts. These are the "temporary hours" which still survive in the liturgy of the Church. Since they spanned the interval from sunrise to sunset, their length varied with the season of the year, from 49 to 71 minutes. Corresponding nocturnal hours, too, seem to have been partially used in the time of the Apostles (Acts 23:23).

As might have been expected, the Sacred Books convey no theory of celestial appearances. The descriptive phrases used in them are conformed to the elementary ideas naturally presenting themselves to a primitive people. Thus, the earth figures as an indefinitely extended circular disk, lying between the realm of light above and the abyss of darkness beneath. The word *firmamentum*, by which the Hebrew *rakia* is translated in the Vulgate, expressed the notion of a solid, transparent vault, dividing the "upper waters" from the seas, springs, and rivers far below. Through the agency of the flood-gates, however, the waters sustained by the firmament were, in due measure, distributed over the earth. The first visibility after sunset of the crescent moon determined the beginning of each month; and this was the only appeal to the skies made for the purposes of the Jewish ritual. Eclipses of the sun and moon are perhaps vaguely referred to among the signs of doom enumerated by the Prophets Joel and Amos, who may have easily have enhanced their imagery from personal experience, since modern calculations show solar totalities to have been visible in Patestine in the years 831, 824, and 763 B.C., and the moon reddened by immersion in the earth's shadow is not an uncommon sight in any part of the world. But the passages in question cannot be literally associated with mere passing phenomena. The prophets aimed at something higher than intimidation. An express warning against ignoble panic was indeed uttered by Jeremias in the words: "Be not afraid of the signs of heaven which the heavens

fear", (x, 2). The stellar vault, conceived to be situated above the firmament, is compared by Isaias to a tent stretched out by the Most High.

# Astronomical allusions in the Old Testament

The "host of heaven", a frequently recurring Scriptural expression, has both a general and a specific meaning. It designates, in some passages, the entire array of stars; in others it particularly applies to the sun, moon, planets, and certain selected stars; the worship of which was introduced from Babylonia under the later kings of Israel.

## The planets

Venus and Saturn are the only planets expressedly mentioned in the Old Testament.

Isaiah 14:12 apostrophizes the Babylonian Empire under the unmistakable type of *Helal* (Lucifer in the Vulgate), "son of the morning".

Saturn is no less certainly represented by the star *Kaiwan*, adored by the reprobate Israelites in the desert (Amos 5:26). The same word (interpreted to mean "steadfast") frequently designates, in the Babylonian inscriptions, the slowest-moving planet; while *Sakkuth*, the divinity associated with the star by the prophet, is an alternative appellation for *Ninib*, who, as a Babylonian planet-god, was merged with Saturn. The ancient Syrians and Arabs, too, called Saturn *Kaiwan*, the corresponding terms in the Zoroastrian *Bundahish* being *Kevan*. The other planets are individualized in the Bible only by implication. The worship of gods connected with them is denounced, but without any manifest intention of refering to the heavenly bodies. Thus, *Gad* and *Meni* (Isaias, lxv, 11) are, no doubt, the "greater and the lesser Fortune" typified throughout the East by Jupiter and Venus; *Neba*, the tutelary deity of Borsippa (Isaias xlvi, 1), shone in the sky as Mercury, and *Nergal*, transplanted frorn Assyria to Kutha (2 Kings 17:30), as Mars.

## Kimah and Kesil

The uranography of the Jews is fraught with perplexity. Some half-dozen star-groups are named in the Scriptures, but authorities differ widely as to their identity. In a striking passage the Prophet Amos (v, 8) glorifies the Creator as "Him that made *Kimah* and *Kesil*", rendered in the Vulgate as Arcturus and Orion. Now *Kimah* certainly does not mean Arcturus. The word, which occurs twice in the Book of Job (ix, 9; xxxviii, 31), is treated in the Septuagint version as equivalent to Pleiades. This, also, is the meaning given to it in the Talmud and throughout Syrian literature; it is supported by etymological evidences, the Hebrew term being obviously related to the Arabic root *kum* (accumulate), and the Assyrian *kamu* (to bind); while the "chains of Kimah", referred to in the sacred text, not inaptly figure the coercive power imparting unity to a multiple object. The associated constellation *Kesil* is doubtless no other than our Orion. Yet, in the first of the passages in Job where it figures, the Septuagint gives *Herper*; in the second, the Vulgate quite irrelevantly inserts Arcturus; Karstens Niebuhr (1733-1815) understood *Kesil* to mean Sirius; Thomas Hyde (1636-1703) held that it indicated Canopus. Now *kesil* signifies in Hebrew "impious", adjectives expressive of the stupid criminality which belongs to the legendary character of giants; and the stars of Orion irresistibly suggest a huge figure striding across the sky. The Arabs accordingly named the constellation *Al-gebbar*, "the giant", the Syriac equivalent being *Gabbara* in old Syriac version of the Bible known as *Peshitta*. We may then safely admit that *Kimah* and *Kesil* did actually designate the Pleiades and Orion. But further interpretations are considerably more obscure.

## Ash

In the Book of Job — the most distinctively astronomical part of the Bible — mention is made, with other stars, of *Ash* and *Ayish*, almost certainly divergent forms of the same word. Its signification remains an enigma. The Vulgate and Septuagint inconsistently render it "Arcturus" and Hesperus". Abenezra (1092-1167), however, the learned Rabbi of Toledo, gave such strong reasons for *Ash*, or *Ayish*, to mean the Great Bear, that the opinion, though probably erroneous, is still prevalent. It was chiefly grounded on the resemblance between *ash* and the Arabic *na 'ash,* "a bier", applied to the four stars of the Wain, the three in front figuring as mourners, under the title of *Benât na 'ash*, "daughtters of the bier". But Job, too, speaks of the "children of Ayish", and the inference seems irresistible that

the same star-group was similarly referred to in both cases. Yet there is large room for doubt. Modern philologists do not admit the alleged connection of Ayish with *na 'ash*, nor is any funereal association apparent in Book of Job. On the other hand, Professor Schiaparelli draws attention to the fact that ash denotes "moth" in the Old Testament, and that the folded wings of the insect are closely imitated in their triangular shape by the doubly aligned stars of the Hyades. Now Ayish in the Peshitta is translated *Iyutha*, a constellation mentioned by St. Ephrem and other Syriac writers, and Schiaparelli's learned consideration of the various indications afforded by Arabic and Syriac literature makes it reasonably certain that *Iyutha* authentically signifies Aldebaran, the great red star in the head of the Bull, with its children, the rainy Hyades. It is true that Hyde, Ewald, other scholars have adopted Capella and the Kids as representative of *Iyutha*, and therefore of "*Ayish* and her children"; but the view involves many incongruities.

## Hadre Theman (Chambers of the South)

The glories of the sky adverted to the Book of Job include a sidereal landscape vaguely described as "the chambers [i.e. *penetralia*] of the south". The phrase, according to Schiaparelli, refers to some assemblage of brilliant stars, rising 20 degrees at most above the southern horizon in Palestine about the year 750 B.C. (assumed as the date of the Patriarch Job), and, taking account of the changes due to precession, he points out the stellar pageant formed by the Ship, the Cross, and the Centaur meets the required conditions. Sirius, although at the date in question it culminated at an altitude of 41 degrees, may possibly have been thought of as belonging to the "chambers of the south"; otherwise, this spendid object would appear to be ignored in the Bible.

## Mezarim

Job opposes to the "chambers of the south", as the source of cold, an asterism named Mezarim (xxxvii, 9). Both the Vugate and the Septuagint render this word by *Arcturus*, evidently in mistake (the blunder is not uncommon) for Arctos. The Great Bear circled in those days much more closely round the pole than it now does; its typical northern character survives in the Latin word *septentrio* (from *septem triones*, the seven stars of the Wain); and Schiaparelli concludes from the dual form of *mezarim*, that the Jews, like the Phoenicians, were acquainted with the Little, as well as with the Great, Bear. He identifies the word as the plural, or dual, of *mizreh*, "a winnowing-fan", an instrument figured by the seven stars of the Wain, quite as accurately as the Ladle of the Chinese or the Dipper of popular American parlance.

## Mazzaroth

Perhaps the most baffling riddle in Biblical star-nomenclature is that presented by the word *Mazzaroth* or *Mazzaloth* (Job 38:31, 32; 2 Kings 23:5) usually, though not unanimously admitted to be phonetic variants. As to their signification, opinions are hopelessly divergent. The authors of the Septuagint transcribed, without translating, the ambiguous expression; the Vulgate gives for its equivalent Lucifer in Job, the Signs of the Zodiac in the Book of Kings. St. John Chrysostom adopted the latter meaning, noting, however, that many of his contemporaries interpreted *Mazzaroth* as Sirius. But this idea soon lost vogue while the zodiacal explanation gained wide currency. It is, indeed, at first sight, extremely plausible. Long before the Exodus the Twelve Signs were established in Euphratean regions much as we know them now. Although never worshipped in a primary sense, they may well have been held sacred as the abode of deities. The Assyrian *manzallu* (sometimes written *manzazu*), "station", occurs in the Babylonian Creation tablets with the import "mansions of the gods"; and the word appears to be etymologically akin to *Mazzaloth*, which in rabbinical Hebrew signifies primarily the Signs of the Zodiac, secondarily the planets. The lunar Zodiac, too, suggests itself in this connection. The twenty-eight "mansions of the moon" (*menazil al-kamar*) were the leading feature of Arabic sky-lore, and they subserved astrological purposes among many Oriental peoples. They might, accordingly, have belonged to the apparatus of superstition used by the soothsayers who were extirpated in Judah, together with the worship of the *Mazzaroth*, by King Josias, about 621 B.C. Yet no such explanation can be made to fit in with the form of expression met with in the Book of Job (xxxviii, 32). Speaking in the person of the Almighty, the Patriarch asks, "Canst thou bring forth Mazzaroth in its time?" — clearly in allusion to a periodical phenomenon, such as the brilliant visibility of Lucifer, or Hesperus. Professor Schiaparelli then recurs to the Vulgate rendering of this passage. He recognizes in Mazzaroth the planet Venus in her double aspect of morning and evening star, pointing out that the luminary designated in the Book of Kings, with the sun and moon, and the "host of heaven" must evidently be next in brightness to the chief light-givers. Further, the sun, moon, and Venus constitute the great astronomical triad of Babylonia, the sculptured representations of which frequently include the "host of heaven" typified by a crowd of fantastic animal-divinities. And since the astral worship anathematized by the prophets of Israel was unquestionably of Euphratean origin, the designation of Mazzaroth as

the third member of the Babylonian triad is a valuable link in the evidence. Still, the case remains one of extreme difficulty.

### Nachash

Notwithstanding the scepticism of recent commentators, it appears fairly certain that the "fugitive serpent" of Job 26:13 (*coluber tortuosus* in the Vulgate) does really stand for the circumpolar reptile. The Euphratean constellation Draco is of hoary antiquity, and would quite probably have been familiar to Job. On the other hand, *Rahab* (Job 9:13; 21:12), translated "whale" in the Septuagint, is probably of legendary or symbolical import.

### Summary

The subjoined list gives (largely on Schiaparelli's authority) the best-warranted interpretations of biblical star-names:

- *Kimah*, the Pleiades;
- the *Kesil*, Orion;
- *Ash*, or *Ayish*, the Hyades;
- *Mezarim*, the Bears (Great and Little);
- *Mazzaroth*, Venus (Lucifer and Hesperus);
- *Hadre theman* — "the chambers of the south" — Canopus, the Southern Cross, and a Centauri;
- *Nachash*, Draco.

## Astronomical allusions in the New Testament

The New Testament is virtually devoid of astronomical allusions. The "Star of the Magi" can scarcely be regarded as an objective phenomenon; it was, at least, inconspicuous to ordinary notice. Kepler, however, advanced, in 1606, the hypothesis that a remarkable of Jupiter and Saturn, which occurred in May of the year 7 B.C., was the celestial sign followed by the Wise Men. Revived in 1821 by Dr. Münter, the Lutheran Bishop of Zealand, this opinion was strongly advocated in 1826 by C.L. Ideler (Handbuch der Chronologie, II, 399). But the late Dr. Pritchard's investigation (Smith's Dict. of the Bible, Memoirs Roy. Astr. Society, XXV, 119) demonstrated its inadequacy to fulfil the requirements of the Gospel narrative.



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