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Abstract. I review in this paper the basic Hebrew planetary terminology. To complete the picture I accompany it with some historical and cultural context, and compare it to the planetary terminology in Arabic, the most widely spoken Semitic language.

Keywords. history and philosophy of astronomy

1. Introduction

As part of the International Year of Astronomy activities in Israel, a public competition was announced, whereby the public was invited to propose Hebrew names for the planets Uranus and Neptune. All the other major planets have Hebrew names, dating back even to biblical times. On the other hand, Uranus and Neptune, which were discovered at times when Hebrew was not considered a living language, are simply termed ‘Uranus’ and ‘Neptune’

In this contribution, I will review the origins of the Hebrew names of the planets and their context, as well as some related notation. Appropriate historical consideration of the Hebrew language cannot ignore related languages, and thus I will also review the relevant Arabic notation.

2. Historical and linguistic background

A thorough account of Hebrew origins and history is definitely beyond the scope of this contribution, so I will give here a very brief description, with only the very broad details, accounting for the major developments in the history of Hebrew.

Hebrew is a member of the Semitic languages family. The most widely spoken Semitic language today is Arabic, followed by Amharic, Tigrinya, and then Hebrew, usually considered the historic language of the Jews. Other important Semitic languages that played an important role in the history of the Middle East were Akkadian, Assyrian, Babylonian and Aramaic, most of them are now considered dead languages.

Between the 10th and the 4th century BCE, classical Hebrew flourished in ancient Israel as a spoken language. This was the language in which the bible was written. During the Hellenistic and Roman periods one finds the next phase of Hebrew – Talmudic Hebrew, between the 3rd century BCE and the 4th century CE. After this period, Hebrew ceased being a spoken language, and its use was generally confined to liturgical purposes and philosophical and scientific writings. This is Medieval Hebrew.

During the late 18th century, as part of the Enlightenment movement, Hebrew was revived as a journalistic and literary language. This tendency culminated in the 19th century in the work of Eliezer Ben Yehuda, who aimed to revive Hebrew as a mother tongue, as part of the Zionist ideology. Nowadays modern Hebrew is one of the two official

languages in Israel (the other is Arabic), and most of Israel's 7 million citizens speak it (Sáenz-Badillos 1993).

Modern Hebrew still has to rely on borrowing vocabulary from other languages, mainly European languages, and the process of adopting new words is constantly on-going. The Academy of the Hebrew Language is an official Israeli institute, one of whose directives is the development of current Hebrew vocabulary (Fellman 1974). The acceptance of the new vocabulary by the general public is usually a very slow process, which is not always successful.

3. Astronomy and judaism

Astral beliefs were prevalent among the nations that surrounded the ancient Israelites. The Mesopotamian religions were completely astral, where each deity had a specific astronomical manifestation, and the motion of heavenly bodies was considered a practical means of the gods to communicate with Man. The Jews oscillated among adopting characteristics of the surrounding beliefs of the Canaanites, the Phoenicians and their likes, the strong Assyrian influence from Mesopotamia, and their own unique monotheistic culture (Ness 1990, McKay 1973).

In this context, the main use of astronomy was for calendrical purposes, using methods developed by the Mesopotamians. However, astrology in its simplest form also infiltrated strongly to Jewish culture.

During the middle ages, Jews participated in the Islamic astronomical endeavor, and many renowned Arab medieval astronomers were Jews, such as Masha'allah Ibn Athari, Maimonides, Levi Ben Gershom, etc.

4. Astronomical terms

In what follows I will review the main planetary terminology, as well as basic astronomical terms, in Hebrew and in Arabic. I will present the words in the alphabet each language uses today, and I'll use English spelling as an approximate pronunciation guide. I preferred not to use a formal phonetic alphabet as the target readers of this publication are not necessarily linguists. I give the modern pronunciation of the Hebrew words, which is strongly influenced by European languages, and is probably extremely different from the original pronunciation in ancient times.

4.1. *Star, Planet*

The Hebrew word for *star* is כֹּכַב (kokhav), while *planet* is referred to as a 'walking star' – כּוֹכֵב לָכָה. Curiously, Arabic uses the same root to refer to *planet* – كَوْكَب (kawkab), while the word for *star* is نَجْم (najm) or نَجْمَة (najma). The common root for the Hebrew *star* and the Arab *planet* probably originates from the Akkadian word 'kakkabu' for *star*.

4.2. *Constellation*

Originally Hebrew used the word מָזָל (mazal) for the zodiacal *constellations*. In modern Hebrew, this word means 'luck', probably hinting at the astrological context of the word. This context is also related to the expression 'worshippers of stars and constellations': עוֹבְדֵי כּוֹכָבִים וּמָזָלוֹת (ovdey kokhavim umazalot), a derogative name for pagans. The word מָזָל probably originates from Akkadian, where 'manzaltu' means the place, or the home of the gods. This meaning is probably related to the Arab word مَنْزِل (manzil), which means a home, a dwelling, but also refers to a part of the Qur'an.

4.3. Earth

The Hebrew word for *Earth* is אֶרֶץ (eretz), and in spite of the similar sound, it is probably not related to the English word. Instead, it is definitely related to the Arab word with the same meaning أَرْض (ard). In both languages the word also means ‘land’, ‘ground’ and ‘country’. Another hint to the ancient origins of the word is its appearance in the first sentence of the Bible.

4.4. Sun

The *Sun* is called שֶׁמֶשׁ (sheme1sh) in Hebrew and شَمْس (shams) in Arabic. The similarity is obvious, and it goes back even to Mesopotamian mythology, where Shamash is the sun god. An alternative Hebrew name, with Talmudic origins, is חַמָּה (khamma), meaning ‘the hot one’. The *Sun* is considered one of the two luminaries whom God created on the fourth day of Creation. This year, on April 8th, Jews held בְּרִכַּת הַחַמָּה (birkat hakhamma). This is a rare ceremony which Jews celebrate every 28 years, when, according to an old tradition, the *sun* returns to its location and configuration at the moment of its creation.

4.5. Moon

The principal Hebrew notation for the *Moon* is יָרֵחַ (yareakh), while in Arabic it is قَمَر (qamar). Obviously, the *Moon* is also mentioned in the story of the Creation, where it is termed ‘the lesser light’. An alternative biblical name which is also used in modern literary Hebrew is לְבָנָה (levana), meaning ‘the white one’.

The word יָרֵחַ is also related to the word יָרַח (=yerakh), meaning ‘month’. Another term for the *Moon* is סָהַר (sahar), which is closely related to the Arab words شَهْر (shahr) meaning ‘month’, and سَهْرَة (sahra) meaning ‘evening’. Another interesting relation is between the principal Hebrew word for ‘month’ – חֹדֶשׁ (khodesh), which has the same root as the word חָדָשׁ (khadash), with the meaning ‘new’, probably because of the relation to the new *moon*.

The *Moon* has a central role in both Jewish and Muslim worship. The Hebrew calendar (originally Mesopotamian) is lunar-solar, while the Hijri calendar is completely lunar. A possible relic of the pagan *Moon* worship exists in Judaism in the form of the Benediction over the New Moon. The blessing is said outside the synagogue, in the light of the waxing moon. Therefore, it is written in large letters, with a special large font, termed ‘moon benediction letters’ – אוֹתֵיּוֹת קְדוּשׁ לְבָנָה (otiyot kidush levana), in order to ease the reading. It can sometimes be found written on the wall of the synagogue or on a marble plate.

4.6. Mercury

Mercury is called in Hebrew כּוֹכַב חַמָּה (kokhav khamma), i.e., the Sun’s star. Sometimes it is simply referred to as כּוֹכַב (kokhav) – ‘star’, with a similar usage by the Assyro-Babylonians, who called it simply ‘kakkabu’. I am not familiar with an etymology to explain the Arab name – عُطَارِد (utared), which is also used in Turkish and the other Turkic languages.

4.7. *Venus*

Venus has several Hebrew notations. The one most commonly used is נֹגַהּ (nogah). The equivalent Arab word is زُهْرَة (zuhra). Both the Hebrew and the Arab terms carry the meaning of 'brightness', 'shine'. It seems that in Hebrew, at least, there is a mix-up in the terminology between the planet *Venus* and the zodiacal light (Gandz 1970).

Other speculated biblical terms for *Venus* include אֵילַת הַשָּׁחַר (=ayelet hashakhar) and הֵילֵל בֶּן שָׁחַר (heilel ben shakhar). This last expression refers to the Canaanite myth of Heilel, the son of the dawn god (Shakhar, which is also the Hebrew word for dawn - שָׁחַר), who rebelled against 'Elion', the chief god, and was expelled from heaven as punishment – a Canaanite version of the myth of Lucifer. In this context, it is interesting to see that the Hebrew word for 'dawn', and the Arab word – فَجْر (fajr), are both built by different roots who carry a similar meaning of 'liberation', 'discharge', 'turning loose'.

4.8. *Mars*

The name for *Mars* is מַאְדִּים (ma'dim), with a pretty obvious etymology – it simply means 'reddening'. On the other hand, the Arab word is مِرِّيخ (mirrikh), and I have not found any plausible etymology for this name. The possibility that it relates to the Babylonian god Marduk, is somewhat dubious, since Marduk is already associated with the planet Jupiter. Another possibility is that it is some kind of a mispronunciation of the name 'Mars'.

4.9. *Jupiter*

Jupiter's Hebrew name is צֶדֶק (tzedek), whose usual meaning is 'justice'. The Arab name is اَلْمُشْتَرِي (almushtari), which means 'the buyer' or 'the owner'. A possible hint to a relation between these two seemingly different etymologies is mentioned in one tradition, according to which *Jupiter* shined all night during Abraham's fight with Chdarlaomer, king of Eilam. In the biblical text it is not mentioned, but it is mentioned that 'Malkitzedek' (מַלְכִּיצֶדֶק), king of Shalem (=Jerusalem) blessed Abraham. It is said that Malkitzedek is a priest of the god 'El Elion', who was described in an Ugaritic text as 'buyer (owner?) of the heaven and earth'.

4.10. *Saturn*

The current Hebrew name of *Saturn* is שַׁבְתַּי (shabtay), and one can easily hear an allusion to שַׁבָּת – Shabbat, the holy day of rest, saturday. This name appears first in the Talmud. It seems that at some point during the Talmud period the Jews adopted the planetary week, where *Saturn* rules saturday, and thus the Hebrew name actually means 'saturday's planet'. There is one appearance in the Bible of another name, with unclear vocalization: כַּיִן, which may read 'kayun', or 'kiwan' (Schiaparelli 1905). The source is probably Akkadian, where 'kayamanu' means 'the steady one', which is similar to Hebrew קָיָם (qayam) – 'exists', or Arabic كَوْن (kawn) – 'existence'. A relic to this ancient word exists in modern Persian, where *Saturn* is named 'kayvon'. It may well be that the name was chosen to refer to the fact that *Saturn* is the most 'stable' planet, i.e., it changes its position relatively slowly. As for the Arab name – زُحَل (zukhal), I suggest its meaning may be related to the same root in Hebrew, where it means 'to crawl', 'to advance very slowly'.

5. Summary

I have introduced in the previous paragraphs the basic planetary terminology in Hebrew and in Arabic. One can clearly see that contrary to the western planet naming scheme, which names all the planets after Roman gods, the Semitic ones are not as systematic. Each name of a planet carries its own unique story. The stories behind the names tell us of a distant past, the past of Mesopotamia and the Middle East, the ‘cradle of civilization’ (as some scholars call this area), with spicy scents of the Bible and very ancient lore. Astronomy certainly played a central role in those early civilizations, in the time keeping techniques and in the myths. It is interesting to see whether the names that will be elected for Uranus and Neptune in Israel this year will gain public acceptance among speakers of modern Hebrew, thus forming a continuing bridge to the beginning of Man’s fascination by the stars and planets.

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