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**Nazwy gwiazd nieba północnego o
etymologii arabskiej**

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Star names of Arabic etymology in the northern sky

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Treść streszczenia

Praca ta została napisana pod wpływem inspiracji rozgwieżdżonym niebem jak i wrodzonej ciekawości do zagadek etymologicznych. Głównym problemem jaki porusza jest geneza nazw gwiazd, które występują dzisiaj w powszechnym użyciu na całym świecie. Analizowane są gwiazdy o nazwach, których dzisiejsze wersje bazują na słowach bądź frazach arabskich. Celem jest zestawienie tych terminów oraz ich analiza pod kątem etymologicznym. Na początku, wyznaczony jest zakres obszaru badań, określona jest metodologia i zawartość rozdziałów pracy.

W pierwszym rozdziale zawarte są ramy teoretyczne, które zajmują się głównie dotychczasowym dorobkiem w dziedzinie nazewnictwa obiektów pozaziemskich z wyszczególnieniem osób, które wniosły najwięcej. Wykreślone są również etapy transferu nazw arabskich do języków europejskich.

Kolejny rozdział to kompilacja nazw gwiazd o etymologii arabskiej z gwiazdozbiorów półkuli północnej. Pogrupowane zostały one alfabetycznie według łacińskich nazw gwiazdozbiorów. Przy każdej gwiazdzie znajduje się jej oryginalna nazwa arabska oraz transkrypcja i tłumaczenie. Zawarte są również informacje na temat pochodzenia nazw.

Ostatni rozdział stanowi krótkie podsumowanie.

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INTRODUCTION

The reason why this thesis came into existence is because of my inclination to the stars. Together with my curiosity towards the meanings of the proper names the topic, which reads: *Star names of Arabic etymology in the northern sky* has come into being. Stars themselves are incredibly captivating, not only for their nomenclature. Those are potential worlds bursting with life ready to be discovered and perhaps in a few hundred years inhabited by humans. The dream of people living on a planet orbiting Vega, Deneb or Betelgeuse is a perspective worth sparing a moment of consideration. Keeping in use names they were given as far as thousands of years ago, made them immortal. They are an inspiring expression of the cultural heritage of ancient civilizations of the planet Earth.

The subject of this thesis is partly linguistic and partly astronomical. The history of astronomy constitutes the entire background while applied linguistics is the main focus. The area of my research comprises different designations for stellar objects throughout the ages of the existence of the Arabic civilization. The primary objective set to accomplish in this work is to gather information on the true etymology of stars names of the northern constellations based on the current data available on the subject.

For the purpose of the present study a choice has been made to focus on stars belonging to northern constellations. Such choice results from three facts. Firstly, these are the constellations that we, Europeans, have the opportunity to observe nightly. Watching those very stars rather than their southern counterparts made me curious about their names in the first place. Secondly, analyzing the origins of all the names would be a task of twice as big scale. Finally, many of the current southern constellations were introduced relatively late and as a result were named with modern words. Therefore, their rather short history in comparison towards the northern constellations hold much less appeal to me, as the analyzed content revolves primarily around ancient times. And thus, the following study includes only fully-visible circumpolar constellations¹ as visible from the North Pole (Ursa Major, Pegasus, Lyra and Cassiopeia among them). There is also a few selected constellations of the celestial equator² included, as they are of high significance, but only during some seasons (Orion, Eridanus, Leo and Aquila among them).

1 Constellations that never set from the viewer's perspective.

2 The projection of the Earth's equator onto the sky.

The star names that are the subject of this thesis come directly or indirectly from the Arabic language. Etymologically, each one included has roots in Arabic. Some have been named by the Arabs, Persians or Turks, while the others were translations of Greek names. There seems to exist a rule that if a name is a description of its position in the whole constellation (ex. Rigel, leg of Orion), it comes from Greek. Otherwise, it most likely comes from Arabic. It should also be noted that only the brightest of visible stars had a chance to be named with an original title (there are few exceptions³). There are currently 210 stars the names of which may be traced back up to medieval Arab countries. The current paper covers 123 star names. Each of them is officially approved by the International Astronomical Union (IAU), which is recognized as an international authority in designating celestial bodies, including stars. Every key organization – NASA, ESA, CSA, that focuses on space science follows those patterns (<http://www.iau.org/about/>).

The current forms of the names have, in many cases, drifted from the original versions being no more than their derivations at present. Each is written with Latin letters. As for pronunciation, their distinctive Arabic sounds have adapted to Latin losing their original value. The standard example being the three Arabic phonemes resembling the European *h* sounds, namely ح *h*, ح *h* and ة *h*, which in most cases were simply reduced to *h*. It should be noted that transliteration into Latin occurred as early as in the Renaissance and thus, was not always perfect. Omission of sounds, which are difficult to pronounce for a European was common. Sounds like ξ or the Arabic glottal stop ء were often simply skipped.

As far as the meaning is concerned, the general visual representation of Ptolemy's constellations⁴ is more or less preserved with stars describing attributes of the whole figure. However, in a number of cases, star names do not correspond to a given constellation attributes whatsoever. This phenomenon indicates that the Arabs did not adopt all the Greek sky figures. Moreover, some Arabic names are traced back to ancient Babylon or to ancient Egypt. For that reason it may be assumed that certain names of stars were based on constellations different than Ptolemy's.

3 See 2.21.1 ALSCIAUKAT (31 Lyncis).

4 See further clarification in chapter 1.

In order to understand the entire etymological process of naming a star it is essential to discover its origin. If asterisms⁵ to which Arabic star names refer to are in no way corresponding to the Greek constellations, an attempt has been made to define the original ones relying on what they had formerly represented.

The structure of this thesis is as follows: the first chapter contains information on the whole process of how Arabic names came to be used throughout the globe. Highlighting the most influential individuals of the process they are recognized by their contribution. Chapter 2 is the main body of the thesis. The stars are arranged by their constellation in an alphabetical order. Each constellation is a separate section given with its Latin name. Stars of the constellation follow in the subsections. These are comprised of an original name in Arabic, ISO 233 transcription and translation based on a reliable source. Necessary explanations are also provided, as well as relevant curiosities.

5 Patterns of stars recognized on Earth's night sky.

CHAPTER 1: HISTORICAL BACKGROUND

Astronomy owes a great deal of its progress to medieval Muslim scientists. Within the Islamic Golden Age (8th - 15th centuries) they translated the world's astronomical works of greatest importance into Arabic. Combining them with their own knowledge and practice they excelled in this field for many centuries (Pachniak 2010: 161).

Out of many works translated into Arabic Greek, Sassanian and Indian ones were particularly influential (Gingerich 1986: 74). Yet, if we were to name one work that inspired and influenced the development of Arabic astronomy in the most prominent way it would undoubtedly be *Almagest*⁶ by Claudius Ptolemy. It is especially interesting from the perspective of the present work as it lists 48 constellations along with 1025 stars belonging to them. However, only some of the brightest stars were given proper names (Thompson 2006). Nevertheless, the constellations proposed by Ptolemy were influential to Arabs to the degree that they were later adopted as their own. According to Robert Lebling:

the Arab astronomers translated Ptolemy's Greek star names into Arabic, and added some of their own that had been passed down by nomadic ancestors who used the stars and star-pictures to guide their passage through the great deserts of the Middle East (2010).

One of the most important treatises on medieval Arabic astronomy is كتاب صور الكواكب (*Kitāb suwar al-kawāḳib*) *Book of Fixed Stars* written in Arabic around 964 AD by a Persian astronomer عبد الرحمن الصوفي 'Abd al-Rahman as-Sufi known in Latin Europe as Azophi. His work contains a thorough analysis of the visible stars' properties based on *Almagest*. It includes updates on Ptolemy's stellar longitudes for they had changed⁷ since the 2nd century when the *Almagest* was compiled. As-Sufi described his methods on calculating precession, which is responsible for the overtime shift of the stellar longitudes. However, his calculations are not exactly precise, since he over-corrected the tables of Ptolemy. The main part of the *Book of Fixed Stars* is divided into segments, each dedicated to a constellation. Within each segment there are two illustrations of a constellation with major stars indicated (one as it appears on the sky and the other as it is drawn on a globe).

6 The name *Almagest* was given in Baghdad when the work was being translated into Arabic (Ridpath chap. 1, Arabic influences)

7 Due to a process called precession of the equinoxes.

These are going to be referred to in the main part of this study. Apart from charts there is always a table including ecliptic coordinates with estimated magnitudes and a detailed commentary. As-Sufi's book was translated into Latin, which resulted in it being an abundant source of today's star names. The book was relied upon for centuries as a textbook by the great Islamic astronomers. Surprisingly, As-Sufi's text has not yet been published in English, though a translation is being prepared by Ihsan Hafez of James Cook University, Townsville. (Kunitzsch 1987: 120-121; Pachniak 2010: 172; Hafez 2011: 121-127; Ridpath chap. 1, Arabic influences).

Another significant figure in the field of naming stars is an astronomer, mathematician and sultan known as Ulugh Beg. He was a grandson of the Mongol conqueror Timur. His catalogue of 1437, *Zij-i Sultani*⁸ was based on original observations of position, unlike many other works of the time. It is even claimed that: "from the time of Ptolemy in the second century until the middle of the fifteenth century, there exists no catalogue of stars made from original observations" (Knobel 1917: 5). He accomplished such a feat by employing the empire's best astronomers of the time in his observatory in Samarkand. Ulugh Beg's major work is also renowned for being a source of star names, which were later adopted by European scholars. His works were compiled and presented in the study *Ulugh Beg's Catalogue of Stars* by Edward Ball Knobel, published in 1917.

The process of adopting the 210 Arabic star names is described in a well-founded way by Robert Lebling. He depicts three main waves of transfer of those linguistic designations into Europe. The first wave took place in the Middle Ages, it is dated back to 10th - 13th centuries. The transmission came about in Spain where a number of Christian scholars studied Muslim works. Fascinated by astronomy, Alfonso X of Castile ordered a compilation of new tables, which were published over 200 years after his death. The first edition of the *Alfonsine Tables* appeared in 1483 (WDL 2011). The Castilian king's work was considerably influenced by As-Sufi's tables, of which he had ordered a free translation⁹. It is said that about 48 names were transferred this way as direct transliterations. We may recognize them as the ones that sound most similarly in both original Arabic names and latinized transcriptions, for example Aldebaran, Rigel or Algol

8 *Zij* is an astronomical Islamic table containing parameters used for calculating positions of the Sun, Moon, stars and planets (Pachniak 2010: 163).

9 This is a possible answer to the cause of some transcription errors that resulted in today's corrupted forms of star names.

(Lebling 2010).

The second wave took place during the late Renaissance in the 16th and 17th centuries. No Arabic sources were used at the time in adopting star names. Only translations of earlier mentioned works were used. For instance, Thomas Hyde completed his edition of Ulugh Beg's tables under the name *Tabulae longitudinis et latitudinis stellarum fixarum ex observatione Ulugbeighi* at Oxford in 1665. Having been corrected and reprinted multiple times, the work had a substantial influence on the subject.

Most of the star names introduced in Europe during this wave were the accomplishment of Johann Bayer, the very same person who introduced the ubiquitous designation, which has been the most common way of referring to stars so far. The system of applying a Greek letter followed by a Latin genitive form of its parent constellation proved efficient - especially in reference to dimmer stars, whereas the bright ones remained recognizable by their traditional names. Bayer's astronomical work, *Uranometria* is regarded as the first modern sky atlas and has been influential on any subsequent atlas to come. He relied a great deal on the first printed edition of *Almagest* in Latin¹⁰. Moreover, he used works that accounted for the astronomical opus of Alfonso X that included *Alfonsine Tables* and an old translation of the *Book of Fixed Stars* (Lebling 2010).

The titles that were absorbed in Europe up to 19th century encouraged further investigation. The third wave is dated to the early 19th century, the time of careful analysis of the gathered sources. The highest number of Arabic star names was absorbed during this period. The most notable figure of this phase is a Lombardian Giuseppe Piazzi. He created a catalogue of 6784 stars, published in 1803. The etymologically Arabic names that he included relied strongly on Hyde's translation of the Ulugh Beg star list (Lebling 2010). Piazzi, however, applied simplifications and generally did not follow Hyde's grammar (Kunitzsch as cited in Lebling 2010).

Ludwig Ideler (1766–1846) is another scholar who offered his contribution to this field. He differentiated between truly Arabic star names and those describing position in a constellation that the Arabs adopted from the Greeks (Lebling 2010). Nonetheless, however profound his investigation on the origin of star names is, having not had access to some vital sources including the *Book of Fixed Stars*, his work lacks completeness

¹⁰ It was based on an Arabic translation (Lebling 2010).

(Kunitzsch as cited in Lebling 2010).

Mohammad al-Achasi al-Mouakket was an Egyptian Sheikh of the Grand Mosque in Cairo. He completed his calendarium and catalogue of stars entitled *Durret al Muddiah Fih al Aamal al Shamsiah* (Pearls of brilliance upon the solar operations) in the 17th century (Knobel 1895: 429). European scholars were unfamiliar with his work until 1895 when it was transcribed and translated by Edward Ball Knobel. Arabic names included in the catalogue were the basis for certain Latin translations.

The last contributor to be included is a person to whom a major part of the essence of this thesis is owed, namely Richard Hinckley Allen (1838–1908). He wrote *Star-Names and Their Meanings* (1899), which was reprinted as *Star-Names: Their Lore and Meaning* (1963). His work chiefly relies upon Ideler's, whose work is considered outdated. Although some claim Allen's book is unreliable, it surely is a wealth of information on lore behind stars. His knowledge of Arabic was very limited, which resulted in unprecise transcriptions of Arabic words (Thompson 2001). Yet, his book consulted with other sources proves invaluable.

CHAPTER 2: NAMES OF STARS

2.1 ANDROMEDA

2.1.1 ALPHERATZ (Alpha Andromedae)

Alpheratz originated as سرة الفرس *surrat al-faras* «the horse's navel». In the past it was associated with Pegasus (Allen 1963: 35; Davies 1944: 11).

2.1.2 MIRACH (Beta Andromedae)

Presumably coming from المراق *al-marāqq* «the loins», the name of Beta Andromedae has the same origin as Merak (Beta Ursae Majoris). It is also often associated with منزر *mi'zar* «a girdle or waist-cloth». The evident resemblance of those titles with the ones of Ursa Major's is caused by the method Arabs undertook when they worked with Ptolemy's Almagest. They simply used descriptions of places to which a given star was assigned to in a figure (Allen 1963: 36; Davies 1944: 11).

2.1.3 ALMACH (Gamma Andromedae)

Known as well as Almak, Almaack, and Almaac or Almaak, Almach and its transliteration versions originated from عناق الأرض *'anāq al-'ard* «caracal, desert lynx» (Allen 1963: 36; Wehr 1976: 649).

2.2 AQUARIUS

2.2.1 SADALMELIK (Alpha Aquarii)

From سعد الملك *sa'd al-malik* «the luck of the king» (Allen 1963: 51).

2.2.2 SADALSUUD (Beta Aquarii)

Originated as سعد السعود *sa'd as-su'ūd* translated into «the luckiest of the lucky». Etymologically, “from its rising with the sun when the winter had passed and the season of gentle, continuous rain had begun” (Allen 1963: 51; Wehr 1976). Literally, «the luck of lucks», but may also be interpreted as «the luckiest». It is a standardized usage of the Arabic genitive construction إضافة *'idāfah*, when المضاف *al-muḍāf* (first unit) is followed with a plural of the same word as المضاف إليه *al-muḍāf ilayhi* (second unit) (Danecki 1994: 407-409).

In the catalogue of Al-Achasi al-Mouakket Beta Aquarii is included as نير سعد السعود

nīr sa'd al-su'ūd and translated into Latin as *Lucida Fortunæ Fortunarium* meaning «the brightest of luck of lucks» (Knobel 1895: 431; Wehr 1976: 410).

2.2.3 SADACHBIA (Gamma Aquarii)

From سعد الأخبية *sa'd al-'ahbiya* «the lucky one of the tents» (Davies 1944: 12; Wehr 1976: 224). Allen says that “the star was so called from its rising in the spring twilight, when, after the winter’s want and suffering, the nomad’s tents were raised on the freshening pastures, and the pleasant weather set in” (1963: 52).

2.2.4 SKAT (Delta Aquarii)

A clear reference to the star’s position in its constellation is given by the meaning of الساق *as-sāq* «the shin» (Davies 1944: 12).

2.2.5 ALBALI (Epsilon Aquarii)

The word comes from البالع *al-bāli'* «the swallower» It is connected with the 21st manzil¹¹ known as السعد البلع *as-sa'd al-bal'* «the good fortune of the swallower», which included Epsilon and Mu Aquarii. Epsilon being a magnitude brighter and close to Mu was said to have swallowed the dimmer star and taken its light (Allen 1963: 53; Lane 1863: 250).

2.3 AQUILA

2.3.1 ALTAIR (Alpha Aquilae)

Altair is a designation that has been in use since Medieval Ages. It is an abbreviated Arabic name for the constellation النسر الطائر *an-nasr at-tā'ir* «the flying eagle or vulture», which was used in the *Book of Fixed Stars*. The form possibly originated in the ancient Babylon as «the eagle star». Altair was featured in Mohammad al-Achsasi al-Mouakket’s catalogue and later translated into Latin as *Vultur Volans* (Davies 1944: 12; Kunitzsch and Smart 2006: 17-18; As-Sufi 1417: 131).

In Arabia, Aquila together with Lyra were called النسرين *an-nasrayn* «the two eagles or vultures». Astrolabes¹² of medieval England and Western Europe depicted Alphas of the two constellations (Altair and Vega) as birds (Davies 1944: 12; Lane 1863: 2780; Gingerich 1987: 89-104).

2.3.2 DENEK EL OKAB (Zeta Aquilae)

ذنب العقاب *danab al-'uqāb* «tail of the falcon». As-Sufi called the whole constellation of Aquila العقاب *al-'uqāb* «the falcon» (1417: 132).

11 One of 28 *manāzil*, part of the Arabic astrological system based on lunar mansions used for calendar.

12 Instruments used to make astronomical measurements, widely used in the medieval Islamic world.

2.4 ARIES

2.4.1 HAMAL (Alpha Arietis)

The Arabic name of the whole constellation, حمل *ḥamal* «lamb» or «ram» (Wehr 1976: 207). The title is derived from the phrase رأس الحمل *ra's al-ḥamal* «the head of the ram» (Allen 1963: 80).

2.4.2 SHERATAN (Beta Arietis)

Comes from the Arabic الشرطان *aš-šaraṭāni* «the two signs». The reason for the dual form is most likely the connection between Beta and Gamma Arietis. Known sources say those two were the points marking the northern vernal equinox, which is “the point at which the Sun crosses the celestial equator from north to south” (Davies 1944: 12; Ridpath chap. 3, Aries)¹³.

However, the name Sheratan originated most probably from the first Arabian Lunar Mansion (cf. explanation for manzil¹⁴), which is called by the same name and marked by the same two stars. Some added the star Hfamal (Alpha Arietis) to «the signs» introducing an alternative title الاشراط *al-ašrāṭ* (Allen 1963: 82; Davies 1944: 12).

2.4.3 MESARTHIM (Gamma Arietis)

Etymology of this name is unclear. According to Allen it may be connected with the Hebrew word for *ministers* (1963: 82). Davies claims it is from the Arabic المثرطم *al-muṭarṭim* «the extremely fat ram» (1944: 13) Some other sources suggest it means *servants* (Gibson).

2.4.4 BOTEIN (Delta Arietis)

The dual form of بطن *baṭn* «belly». It is unknown to what figure the title refers (Allen 1963: 83).

2.5 AURIGA

2.5.1 CAPELLA (Alpha Aurigae)

Capella is from the Latin «the little she-goat». However, it had been proclaimed *the goat star* long before, at the time of the Akkadian empire. Then, it was adopted into Arabic as العيوق *al-'iyūq* «the goat» (Davies 1944: 13). We may safely assume that today's Latin title Capella has roots in the Arabic name.

¹³ This point is not stationary and changes overtime due to precession of the equinoxes. It is now in Pisces.

¹⁴ See 2.2.5

2.5.2 MENKALINAN (Beta Aurigae)

From منكب ذي العنان *mankib dī-l-‘inān* «shoulder of the rein-holder» (Allen 1963: 89; Higgins 1882:29).

2.5.3 ALMAAZ (Epsilon Aurigae)

As opposed to Capella (the she-goat) Almaaz is from the Arabic الماعز *al-mā‘iz* «the he goat» (Allen 1963: 90; Kaler 1999).

2.5.4 ALKAB (Iota Aurigae)

From الكعب ذي العنان *al-ka‘ab dī-l-‘inān* «the heel of the rein-holder» (Allen 1963: 89; Kaler 1999)¹⁵.

2.6 BOÖTES

2.6.1 NEKKAR (Beta Boötis)

It is the Arabic name for the constellation. From بقار *baqqār* «the herdsman». The conspicuous change of the first radical is in all likelihood the effect of mistransliteration. Arabic letter ب *b* in initial position of a word differs from ن *n* only by the position of a dot¹⁶ (Allen 1963: 97). Similarly as with Betelgeuse (Alpha Orionis), the omission of dots could have contributed towards the erroneous name as well.

2.6.2 IZAR (Epsilon Boötis)

Most likely from إزار *‘izār* «loin-cloth» (Wehr 1976: 14).

2.6.3 MUPHRID (Eta Boötis)

مفرد الرامح *mufrid ar-rāmiḥ* «the (single) one of the lancer» (Cannon 1994: 264).

2.6.4 ALKALUROPS (Mu Boötis)

It has been Inkalunis of the *Alfonsine Tables* and Incalurus of the *Almagest*. Originated from Ptolemy’s Κᾰλᾰυροψ «the shepherd’s crook», from which the Arabs developed a transliteration adding the article al- (Allen 1963: 106; Davies 1944: 14; Higgins 1882: 18).

2.7. CANCER

2.7.1 ACUBENS (Alpha Cancry)

Acubens of the *Alfonsine Tables*. It could have undergone two consecutive translations, from Greek to Arabic and from Arabic to Latin like a number of titles proposed in the

¹⁵ The name is said to have been applied to Gamma Aurigae in the past, but now the star is considered to be a part of Taurus (Elnath, Beta Tauri) (Allen 1963: 90; Kaler 1999).

¹⁶ Old written Arabic sources often omit usage of dots making the two letters indistinguishable.

tables of Alfonso X. The Arabic name was الزبن *az-zuban* «the claw» (Higgins 1882: 43; Gibbson).

2.7.2 TARF (Beta Cancry)

Also referred to with Taraf. The origin is similar to Alterf's (Lambda Leonis). From الطرف *aṭ-ṭarf* «the eye, glance, look» or «the glance of the lion» (Gibson; Mohammad Odeh 1998; Wehr 1976: 558). Perhaps it marks the point, which the lion is gazing at.

2.8 CANIS MINOR

2.8.1 GOMEISA (Beta Canis Minoris)

Comes from غميصاء *gumaiṣā'*, the diminutive of غمصاء *gamṣā'*, which is a feminine form of أغمص *ʿagmaṣ* «blear-eyed» (Lane 1863: 2295; Wehr 1976: 684).

The title used to be one of Procyon's (Alpha Canis Minoris). It also refers to an Arabic myth concerning Sirius (Alpha Canis Majoris), Procyon and Canopus (Alpha Carinae). The myth said the three stars were sisters. The sisters were together until Canopus descended into the south and Sirius followed¹⁷. Procyon, who was the smallest of the sisters remained and wept for her loss (Davies 1944: 15; Lane 1863: 2296). This explains the etymology of Gomeisa: she was the smallest (diminutive) of the sisters who wept until her eyes got bleary.

2.9 CASSIOPEIA

2.9.1 SCHEDAR (Alpha Cassiopeiae)

The first known appearance of the traditional name in European culture was in the *Alfonsine Tables* of 13th century. The name Schedar is said to have come from صدر *ṣadr* «breast». In the visual representations of Cassiopeia Schedar marks her breast (Allen 1963: 146).

Ulug Beg called it in his tables ذات الكرسي *dāt al-kursiy* «the lady in the chair», with a literal meaning «she who has the chair». Although, this title did not find its way to contemporary use, it did somehow influence the perceiving of the constellation as a lady who always sits on the chair (illustration 2.6.1) (As-Sufi 1417: 94; Allen 1963: 146).

2.9.2 CAPH (Beta Cassiopeiae)

Caph comes from the Arabic كف *kaff* «palm» or «hand». It also is the name of Arabic letter ك Kaf. The name is connected with the pre-Islamic term الكف الخضيب *al-kaff al-ḥaḍīb*, «the

¹⁷ Both stars belong to southern constellations.

stained hand», which can be found on As-Sufi's manuscripts of the *Book of Fixed Stars* (Kunitzsch and Smart 2006: 26; Sufi 1417: 95; Wehr 1976: 831).

2.9.3 RUCHBAH (Delta Cassiopeiae)

ركبة *rukba* «knee»¹⁸. In the *Book of Fixed Stars* the star is designed الركبتيين *ar-rukbatayn* «the two knees» (Sufi 1417: 96).



Illustration 2.9.1: The lady in the chair from the *Book of Fixed Stars* (As-Sufi 1417: 94).

¹⁸ Not to be confused with Ruckbat (Alpha Sagittarii), which points the archer's knee.

2.10 CEPHEUS

2.10.1 ALDERAMIN (Alpha Cephei)

In Latin it was Al Deraimin of the *Alfonsine Tables* of 1521. The etymological origin of the word lies in the Arabic phrase الذراع اليمين *ad-ḍirā‘ al-yamīn* «the right arm» (of Cephheus) (Allen 1963: 158). However, this form is grammatically incorrect, because paired parts of the body always have feminine forms in Arabic, thus, making attributive adjectives feminine as well. The correct form would be الذراع اليمنى *ad-ḍirā‘ al-yumnā* (as cited in Turek 2003: 188)¹⁹.

2.10.2 ALFIRK (Beta Cephei)

A third magnitude star with the traditional name Alfirk الفرق *al-firq* «the flock» (Wehr 1976: 708). According to Allen, Ideler implicated that it is unreasonable that a single star would represent a flock. Therefore, Alfirk must have received its name by mistake. A possible clarification is offered by Ulug Beg who introduced the term كواكب الفرق *kawāḳib af-firq* «the stars of the flock», which refers to Alpha, Beta and Eta Cep (Davis 1944: 16; Allen 1963: 158).

2.10.3 ALRAI, ERRAI (Gamma Cephei)

Both traditional names Alrai and Errai derive from الراعي *ar-rā‘ī* «the shepherd». The title was given by indigenous Arabs (Allen 1963: 159).

2.10.4 KURHAH (Xi Cephei)

Kurhah is a derivation from القرحة *al-qurḥa* «the white mark in the face of a horse» (Davis 1944: 16; Lane 1863: 2510).

2.11 CETUS

2.11.1 MENKAR (Alpha Ceti)

From المنخر *al-minḥar* «the nostril», though it marks monster’s jaws rather than its nose.

The Arabs call Cetus القيطس *al-qīṭus*, which is translated as «the whale» or «sea monster» depending on the source (Wehr 1976: 806).

2.11.2 DENEK KAITOS, DIPHDA (Beta Ceti)

The brightest star of the constellation bears two names of similar usage today. Deneb Kaitos comes from ذنب القيطس الجنوبي *danab al-qīṭus* «the southern branch of the sea

¹⁹ Alderamin will become the Polaris (pole star) of the year 7500 (Allen 1963, 158).

monster's tail» (Davies 1944: 16-17).

The other name of the early Arabs comes directly from الضفدع الثاني *aḍ-ḍifdiʿ* / *ḍafdaʿ aṭ-tānī* «the second frog». This belonged to an asterism together with Fomalhaut²⁰, the former الضفدع الاول *aḍ-ḍifdiʿ* / *ḍafdaʿ al-awwal* «the first frog» (Allen 1963: 164, 346; Davies 1944: 17; Wehr 1976: 543).

2.11.3 KAFFALJIDHMA (Gamma Ceti)

Originally referred to all stars in the Whale's head كف الجذماء *kaff al-ğadmāʿ* «the cut-short hand». According to Allen, before the Arabs had a chance to get to know Greek constellations, they had divided Cetus into three very different asterisms. Among them today's Cetus' head as *the part of a hand*. He says it was a reference to *stained hand* (pre-Islamic representation of Cassiopeia and the etymology of Caph, Beta Cassiopeiae) (Allen 1963: 162; Wehr 1976: 117).

2.11.4 BATEN KAITOS (Zeta Ceti)

Derived from بطن القيطس *baṭn al-qīṭus* «the sea-monster's belly» (Davies 1944: 17).

Kaitos is a name that looks as if it was a mistransliterated القيطس *al-qīṭus*. Without diacritics it is hard to distinguish between the long vowel *ī* and the diphthong *ai*, which could be the case for this.

2.12 CORONA BOREALIS

2.12.1 ALPHEKKA (Alpha Coronae Borealis)

It is the Arabic name of Corona Borealis, الفكة *al-fakka*, the meaning of which is quite obscure. The root فك *fakka* means «to break, to separate, to fragmentize». This alludes to the shape of the constellation, which resembles a broken circle of stars (illustration 2.26.1). Thus, we may interpret الفكة as «the broken one, the fractured one» (Davies 1944: 17; Lane 1863: 2430-2431; Wehr 1976: 723).

2.12.2 NUSAKAN (Beta Coronae Borealis)

Some sources say it comes from النسفان *an-nasaqāni* «the two lines». It is mentioned by Kaler that the lines outlined a small part of the ancient Arabic constellation, the Pasture²¹. (1999; Davies 1944: 17; Wehr 1976: 962).

20 Alpha of the southern constellation Piscis Austrini, its name meaning *the fish's mouth* (Allen 1963: 346).

21 This ancient constellation was huge, comprised of several large constellations we know including Hercules and Ophiuchus (Kaler 1999).

صورة الفكرة على ما ترى في الكرة

فكرة الفكرة على ما ترى في الكرة
فكرة الفكرة على ما ترى في الكرة
فكرة الفكرة على ما ترى في الكرة



صورة الفكرة على ما ترى في السماء

صورة الفكرة على ما ترى في السماء
صورة الفكرة على ما ترى في السماء
صورة الفكرة على ما ترى في السماء



Illustration 2.12.1: Corona Borealis in the eyes of As-Sufi from the *Book of Fixed Stars* (As-Sufi 1417: 70).

2.13 CYGNUS

2.13.1 DENEK (Alpha Cygni)

One of many stars marking the tail of what the constellation represents²². In this particular case it is ذنب الدجاجة *danab ad-daḡaḡa* «the hen's tail» (Higgins 1882: 23).

What is intriguing about Cygnus is that to the Arabs it was a hen (illustration 2.12.1), whereas today it is seen as a swan. This probably happened when the Romans adopted the Greek constellation as their mythical swan. The Arabs on the other hand, interpreted it in their own way. Also, translation errors were a significant issue in the past. And thus, today we have Cygnus (swan) with a multitude of stars, the Arabic names of which are abbreviated from phrases connected with parts of hen's body. (As-Sufi 1417: 88; Allen 1963: 192).

2.13.2 ALBIERO (Beta Cygni)

The traditional title is a result of mistranslation. It is said to have originated as the Greek name for the constellation, *ornis*. Being corrupted into *urnis* in Arabic, it was later mistaken for the plant Erysimum, *Irio-onis* in Latin. Hence, in Almagest of 1515 it appeared as *ab ireo*; Arabic article *al* with Latin *Irio*. The one derivation that remained in use today is Albireo (Higgins 1882: 24; Allen 1963: 196).

2.13.3 SADR (Gamma Cygni)

A star name of the same origin as Schedar (Alpha Cassiopeiae). It is from صدر الدجاجة *ṣadr ad-daḡāḡa* «the hen's breast» (Davies 1944: 18).

2.13.4 GIENAH (Epsilon Cygni)

Derived from جناح *ḡanāḡ* «wing». Gienah is also the name of Gamma Corvi, where it represents a wing of the Crow. Similarity of names like those may be confusing. A distinction to Gienah Cygni and Gienah Corvi was established in order to deal with this issue (Kaler 1999).

22 Several different stars bear names related to tails of creatures, such as Denebola or Deneb Algedi.



Illustration 2.13.1: Cygnus as a hen in *Book of Fixed Stars* (As-Sufi 1417: 88).

2.13.5 AZELFAFAGE (Pi1 Cygni)

ظلف الفرس *zīlf al-faras* «the hoof of the horse» is the presumable form referring to the neighboring constellation of Pegasus (Allen 1963: 197; Higgins 1882: 24). According to Ideler:

It follows either that the foot of Pegasus [now marked by π Pegasi] extended to this star, or that in this region was supposed to be located the feet of the Stallion which, as we shall see farther on, some Arab astronomer introduced between Pegasus and the Swan (as cited in Allen 1963: 197).

A more suitable title, yet less common is ذيل الدجاجة *dayl ad-dağāğā* «the tail of the hen». The tail is exactly what the star marks in the constellation (Allen 1963: 198).

2.14 DELPHINUS

2.14.1 DENEK DULFIM (Epsilon Dulphini)

Yet another “deneb” (tail), this time belonging to a dolphin. From ذنب الدلفين *danab ad-dulfīn* «tail of the dolphin» (As-Sufī 1417: 135; Gibson; Wehr 1976: 290).

2.15 DRACO

2.15.1 THUBAN (Alpha Draconis)

The name of the star refers to the whole constellation of Dragon. It comes from Arabic ثعبان *tu‘bān* «snake» or «serpent» (Wehr 1976: 103), which seems logical due to cultural similarities between snakes and dragons. Furthermore, the constellation’s visual interpretations all have a rather serpentine look rather than a winged monster. The name itself was a translation of Ptolemy’s δράκων *drakon*, the Latin Draco. Although Thuban has been designated by Bayer as Alpha, it is hardly the brightest star in the constellation²³.

Sayce says that the great astrological and astronomical work compiled for the first Sargon, king of Agade, or Akkad, devoted much attention to this star, then marking the pole, as Tir-An-na, the Life of Heaven; Dayan Same, the Judge of Heaven; and Dayan Sidi, the Favorable Judge, — all representing the god Caga Gilgati, whose name it also bore (Allen 1963, 207).

²³ It is estimated that Thuban was the north pole star in 2700 BC through the process of precession, thus making it historically significant (Kaler 1999).

2.15.2 RASTABAN, ALWAID (Beta Draconis)

Rastaban is the common name for Beta Draconis. It originated as رأس الثعبان *ra's at-tu'bān* «head of the serpent» or «dragon's head» (Allen 1963:208).

The second title, Alwaid, refers to a different representation of the constellation. It was seen not only as a dragon, but also as a dramatic scene of mother camels (Gamma, Xi, Nu and Beta Draconis) surrounding a baby camel and protecting it from approaching hyenas. The name for the whole asterism given by nomadic tribes was العوائد *al-'awā'id* «the protecting mother camels»²⁴ (Bouw 2002: 53-56).

2.15.3 ETANIN (Gamma Draconis)

It is practically synonymous to Thuban (dragon). The name comes from the Arabic التنين *at-tinnin* Hebrew תַּיִן «the dragon» or «the great serpent». With this name As-Sufi entitled the whole constellation (Davis 1944: 18; Lane 1863: 318; Sufi 1417: 53).

2.15.4 ALTAIS (Delta Draconis)

It is known that apart from a very common Latin name for this star, Nodus Secundus, it has two other titles with Arabic etymology, namely Altais and Aldib (Kaler 1999; Bakich 1995: 184). Altais is from Arabic التيس *at-tays* «the he-goat». The title is equally applicable to three stars in the constellation with slight variations. Delta Draconis as Altais, Pi Draconis as Tais I and Rho Draconis as Tais II (Wehr 1976: 100; Rhodes 1971). According to Allen, the name was in use during the late period of Arabic indigenous astronomy. Together with Epsilon Draconis (Tyl) the above mentioned stars were to form an asterism, which was also known as التيس «the he goat». At the time, Arabs were known for calling stars with animal names (Allen 1963: 210).

The star has another title, Aldib, which comes from الذئب *ad-di'b* «the wolf», and is probably related to the idea of mother camels protecting a little one from attacking predators.

2.15.5 ALDHIBAH (Zeta Draconis), ALDHIBAIN (Eta Draconis)

الضباع *ad-dibā'* «the hyenas» refers to a couple of stars associated with the scene where instead of a dragon, the constellation presents hyenas waiting for the moment to strike and mother camels (head of the dragon) protecting a baby camel (a faint star in the head) (Allen 1963, 210). الضبعان *ad-dab'ān* «the two hyenas» is related to the most distinctive hyenas only (Zeta Draconis, Eta Draconis) (Rumrill 1936: 139–154). The form Aldhibain consists of two vowels *i* which are both absent in the Arabic word. Although, vowels are

²⁴ Arabic letter ع is sometimes simply omitted in transliteration.

usually not written, which might be the cause of this mistransliteration.

2.15.6 EDASICH (Iota Draconis)

The current title of Edasich originated as الذبيح *ad-dīḥ* «the hairy male hyaena». (Allen 1963: 211; Davies 1944: 18). Today, however, the term is also used for male, not necessarily hairy dogs.

2.15.7 GIANSAR (Lambda Draconis)

Also known as Giausar or Giauzar, the origin of those names is traced back to Persian جوزهر *ġawzahr* «the dragon's head and tail» (Davis 1944: 18-19).

2.15.8 ARRAKIS (Mu Draconis)

Arrakis or Errakis are both transliterations of الراقص *ar-rāqiṣ* «the dancer»²⁵ (Allen 1963: 212; Lane 1863: 1136). The dancer in this case could signify “the trotting camel”, which would represent one of the camels running to join the mothers protecting a little one (Dragon's head) (Kunitzsch and Smart 2006: 35; Allen 1963: 212).

2.15.9 GRUMIUM (Xi Draconis)

One of العوائد *al'awā'id* «the mother camels» (Allen 1963: 207). Grumium is probably a barbarism of γέvuς, used for the star in Ptolemy's Almagest (Allen 1963: 212).

2.16 EQUULEUS

2.16.1 KITALPHA (Alpha Equulei)

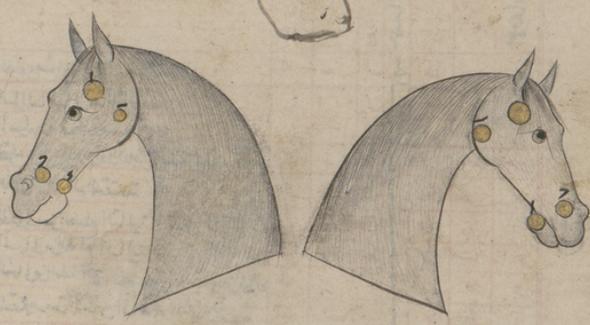
It comes from the phrase قطعة الفرس *qiṭ'at al-faras* «part of a horse». Only the head and shoulders of Equuleus are displayed as seen on the illustration 2.22.1 (As-Sufi 1417: 138; Davies 1944: 19; Kaler 1999).

²⁵ The name Arrakis was featured as a fictional desert planet in a popular science fiction series by Frank Herbert, Dune.



صورة قطعة الفرس على رجب السماء

صورة قطعة الفرس على ما يرى في الكرم



جدول كو كبر قطعة الفرس مراده سميت على ما في المجسط في الطول

العرض	الطول	اسماء الكواكب
١	١	المتقدم من الاثنين اللذان في الرأس
٢	٢	التالي منهما
٣	٣	المتقدم من الاثنين اللذين في النجم
٤	٤	التالي منهما

فذلك كو كبر من باقي الفدر الربع **١** والخامس **٢** والسادس **٣**

دوم

Illustration 2.22.1: Equuleus from *Book of Fixed Stars* (As-Sufi 1417: 138).

2.17 ERIDANUS

2.17.1 ACHERNAR (Alpha Eridani)

Transliterated version of the Arabic آخر النهر *āḥir an-nahr* «the end of the river». The title was originally applied to Theta Eridani (Davies 1944: 19).

Eridanus is said to have been regarded as a river in the times of the Babylonian empire, with certain Greek and Egyptian myths originating from it. It was presumably known as *the Star of Eridu* (MUL.NUN.KI²⁶). Eridu was an ancient city near the mouth of the Euphrates River (White 2008: 98). It is claimed by Brown that the Euphrates was associated with the sky figure (as cited in Allen 1963: 216).

2.17.2 CURSA (Beta Eridani)

Orion is such a distinctive constellation that it brings in substantial influence onto the surrounding stars²⁷. One example of this is Cursa. It is a derived form of الكرسي الجوزاء *al-kursī al-ǧawzā'* «the footstool (or chair) of the central one». The footstool is actually an asterism composed of Beta Eri together with Tau Ori, Lambda Eri and Psi Eri. Still, only the brightest ones inherited the title (Allen 1963: 218; Kaler 1999).

2.17.3 ZAURAK (Gamma Eridani)

“It is just the sort of star you would expect to find floating in Eridanus” as Kaler describes it in connection with the word’s etymology (1999). Zaurak is from the Arabic phrase النائر الزورق *an-nā'ir az-zauraq* «the bright one of the boat» (Davies 1944: 19).

2.17.4 AZHA (Eta Eridani)

Azha is recognized as a corrupted form of ادحي from ادحي النعام *udḥī an-na'ām* «the hatching place of the ostrich». The letter ڍ was mistakenly written as ز by a copyist. The erroneous copies were later the basis for creating the transliterated title of Azha (Davies 1944: 19; Gibson).

2.17.5 ACAMAR (Theta Eridani)

The star that originally bore the title of Alpha Eridani (Achernar). Similarly to Achernar, Acamar is a transliteration of آخر النهر *āḥir an-nahr* «the end of the river», although a more distorted one (Davies 1944: 19).

2.17.6 BEID (Omicron¹ Eridani)

From بيض *bayḍ* «eggs». The meaning concerns the ostrich’s nest (Allen 1963: 219).

²⁶ An entry in MUL.APIN, a compedium of Babylonian atronomy and astrology.

²⁷ After all it is the Central One (see 2.23.1)

2.17.7 KEID (Omicron² Eridani)

The eggshells thrown out from the nest, قبيض *qayd* «eggshell» (Allen 1963: 220; Wehr 1976: 806).

2.18. GEMINI

2.18.1 ALHENA (Gamma Geminorum)

This name comes from الهنعة *al-han'a* and is usually translated as «the brand-mark on the right side of a camel's, or horse's neck» (Allen 1963: 231; Davies 1944: 20; Knobel 1895: 429).

2.18.2 WASAT (Delta Geminorum)

Coming from وسط *wasat* «middle» or «center», the name has preserved itself in a form that is still a frequently used Arabic word (Wehr 1976: 1066). The star name may refer to its central position in the Gemini constellation²⁸ (Allen 1963: 235).

2.18.3 MEBSUTA (Epsilon Geminorum)

To ancient Arabs this star and Zeta Geminorum were paws of a lion and do not correspond in any way with today's Gemini as twins. Mebsuta is ذراع الاسد المبسوطة *dirā' al-asad al-mabsūṭa*, «the outstretched paw» (Davies 1944: 20).

2.18.4 MEKBUDA (Zeta Geminorum)

Mekbuda's name comes from ذراع الاسد المقبوضة *dirā' al-asad al-makbūḍah* «the lion's folded» (Davies 1944: 20).

2.19 HERCULES

2.19.1 RASALGETHI (Alpha Herculis)

The mythological divine Heracles was degraded by Arabian astronomers to being a kneeler. Rasalgethi is رأس الجاثي *ra's al-ḡāṭī* «the kneeler's head» based on the name of the constellation: جاثي على ركبتيه *ḡāṭī 'alā rukbatayhi* «the kneeler on both his knees» (Davies 1944: 20).

Observing the visualized version of the constellation in relation to Draco we see a man above the dragon's head. Furthermore, it may correspond to an Akkadian myth where it was Gilgamesh standing on the head of the conquered dragon (Vonnegut).

²⁸ Very close to Delta Geminorum lies a radiant point (center) for annual Geminids meteor shower with a maximum in December.

2.19.2 MARFIK (Kappa Herculis)

Also known as Marfak, Marsic and Marfic, all the titles come from مرفف *marfiq* «the elbow», though Marfik is the most accurate transliteration (Allen 1963: 244).

2.19.3 MAASYM (Lambda Herculis)

From معصم *mi'ṣam* «wrist» (Allen 1963: 244). Although, the traditional name looks and sounds oddly similarly to the plural form of the word: معاصم *m'āsim* «wrists», it has not been taken into account in any etymological analysis (Wehr 1976: 617).

2.20 LEO

2.20.1 REGULUS (Alpha Leonis)

Alpha Leonis' name dates back to the Bronze Age, when its title was *kakkab šarru* in Babylonian-Assyrian «the star of the king». To Arabs it was الملكي *al-malikī* «the royal (star)». The present version of the Latin name Regulus (prince or little king) was introduced by Copernicus and it is a diminutive form of Rex, the King (Davis 1944: 21; Allen 1963: 256).

In the reference to the whole constellation Alpha Leonis also bore the name قلب الأسد *qalb al-'asad*, «the heart of the lion». Regulus is listed in MUL.APIN as LUGAL, which means *the star that stands in the breast of the Lion: the King* (Rogers 1998: 18).

2.20.2 DENEbola (Beta Leonis)

Denebola is the modern name for the Arabic ذنب الاسد *danab al-'asad*, «tail of the lion» (Allen 1963: 258).

2.20.3 ALGIEBA (Gamma Leonis)

According to English astronomer Smyth (1788-1865) the star:

has been improperly called Algieba, from Al jeb-bah, the forehead; for no representation of the Lion, which I have examined, will justify that position, — (as cited in Allen 1968: 260).

As the positioning of the star does not match its name, الجبهة *al-ğabha* «the forehead», then it must be due to an error in transcription or by design (Allen 1963: 260).

2.20.4 ALGENUBI (Epsilon Leonis)

Epsilon Leonis has been designated by the Arabs as رأس الأسد الجنوبي *ra'ās al-'asad al-ğanūbī* «the southern of the lion's head». It is scarcely known as Ras Elased Australis, which is transliteration of the Arabic phrase. *Australis* is the Latin equivalent for *southern*.

Algenubi is generally a more recognizable name. However, both titles of this star are rather rarely in use today (Allen 1963: 260).

2.20.5 ADHAFERA (Zeta Leo)

Among with two dimmer stars in the constellation, it was designated as ضفيرة *ḍafīra* «plaited or twisted hair». The three stars point at the Lion's mane (Davies 1944: 21; Wehr 1976: 543)

2.20.6 CHERTAN (Theta Leonis)

The title Chertan originated as الخراتان *al-ḥarātān* «the two small ribs». Theta Leonis shared this title with Delta Leonis as the other rib (Davies 1944: 21).

2.20.7 ALTERF (Lambda Leonis)

It comes from Arabic الطرف *aṭ-ṭarf* «the eye, glance, look», it is also interpreted as «the glance of the lion». The star should point at the Lion's eye, yet not all illustrated modern maps succeed in doing so (Allen 1963: 263; Davies 1944: 21; Mohammad Odeh 1998; Wehr 1976: 558).

2.20.8 RASALAS (Mu Leonis)

The northern companion of Algenubi (Epsilon Leonis) is رأس الأسد الشمالي *ra'as al-'asad aš-šamālī* «the northern (star) of the lion's head». In modern lists it stands as an abbreviated form Rasalas (Allen 1963: 263).

2.21 LYNX

2.21.1 ALSCIAUKAT (31 Lyncis)²⁹

From شوكة *šauka* «thorn». This star is surprisingly dim to receive a proper name (Kaler 1999).

2.22 LYRA

2.22.1 VEGA (Alpha Lyrae)

It is the second brightest star in the northern hemisphere. Vega is a loose transliteration of the word واقع *wāqi'* «falling» from the phrase النسر الواقع *an-nasr al-wāqi'* «the falling eagle or vulture». The significance of Alpha Lyrae has been prominent since the times of ancient cultures³⁰. It has already been represented by an eagle or a vulture in ancient India

²⁹ The only star included in this paper that does not even have Bayer designation.

³⁰ Around 12,000 BC Vega was the pole star and will become one again around AD 14,000. It was the brightest of pole stars for Earth (Allen 1963: 287)

(Allen 1963: 282; Sufi 1417: 83).

The constellation also used to be represented by an attacking predator. As Allen points out, contrasting towards visual representation of Aquila, Lyra's stars form a bird with half-closed wings swooping down onto its prey (1963: 283).

2.22.2 SHELIQ (Beta Lyrae)

A derivation from Greek into Persian شليق *šalyāq* «the tortoise». The title originated from the little tortoise that was used by mythological Hermes to construct the first stringed musical instrument (Davies 1944: 22).

The name is often associated with the whole constellation. At some point Lyra must have been seen as a turtle (Staal 1988: 185)³¹.

2.22.3 SULAFAT (Gamma Lyrae)

From the Arabic السلحفاة *as-sulḥafāt* «the turtle» (Wehr 1976:421).

2.23 ORION

2.23.1 BETELGEUSE (Alpha Orionis)

Betelgeuse is the brightest star in the Orion constellation as well as one of the largest stars known.³² It stands as a good example of how scholarly errors can creep into language. Experts claim its name traces back to يد الجوزاء *yad al-ḡawzā'* «hand of the giant» named at least as early as the star charts of As-Sufi in 10th century, but probably much earlier than that. The initial Arabic letter of the word *hand* ي *y* was confused with ب *b* differing by the number of dots underneath and lead to mistransliteration into medieval Latin by John of London, whose star table from 13th century names the star Bedalgeuze. European scholars, including Joseph Scaliger, accepted this form believing the name came from إبط الجوزاء *ibṭ al-ḡawzā'* «the armpit of the giant» (Lebling 2010).

The original meaning of الجوزاء *al-ḡawzā'* refers to the Gemini constellation (and is sometimes translated as Gemini) to the stars of which Betelgeuse had been likely matched before it was organized by Ptolemy. *The hand of the giant* – *the giant* being Orion – is another translation used, which puts a reference to the Greek mythology. The Giant is directly connected to Algebar, الجبار *al-ḡabbār* in Arabic³³. It is also referred to as *the*

31 Fine harps were traditionally made from tortoiseshell.

32 If it were put in place of our own sun, its outer surface would reach Mars.

33 The Armenians have long known Orion as *Haik*, yet another Giant being a propagator of Armenian nation.

central one (Allen 1963: 306-307).

2.23.2 RIGEL (Beta Orionis)

Universally used name is Rigel, from رجل الجوزاء اليسرى *riġl al-ġawzā' al-yusra* «the left leg of the giant» (Allen 2003: 312). It has been stated that the name dates from the 10th century and is one of the oldest extant Arabic star names in Western astronomy. (Kunitzsch 1959: 46).

Another Arabic name is رجل الجبار *riġl al-ġabbār* «the foot of the giant», which is also the source of the rarely-used variant names Algebar or Elgebar. Arabs also used راعي الجوزاء *ra'ī al-ġawzā'* «the herdsman of the giant», which was given by As-Sufi. The herdsman's camels were Alpha, Beta, Gamma and Kappa Orionis (Allen 1963: 312).

2.23.3 BELLATRIX (Gamma Orionis)

Bellatrix, alternatively known as the Amazon Star is Latin for Female Warrior. According to Allen, it is a freely made translation (*Alfonsine Tables*) of the Arabic النجيد *an-naġīd* «the conqueror» and was introduced by the Persian astronomer Kazwini. The star is also referred to as a herald roaring in order to announce himself, Rigel or the whole constellation (1963: 313).

2.23.4 MINTAKA, ALNILAM, ALNITAK (Delta, Epsilon, Zeta Orionis)

An asterism of three bright stars Alnitak, Alnilam and Mintaka is commonly known under the name of the Orion's Belt or the Belt of Orion. Among many names in different cultures the Arabic ones include النجاد *an-niġād* «the sword belt», النسق *an-nasaq* «the line», الالفاظ *al-'alqāṭ* «the golden grains» «the golden nuts» and, in modern Arabic, ميزان الحق *al-mīzān al-haqq* «the accurate scale beam» (Allen 1963: 315; Wehr 1976: 944).

Individually, each of the stars possesses a name originating from the collective terms and thus are connected with the same notion. Mintaka's name as well as Alnitak's are connected with the core – نطق. Mintaka is منتقة *minṭaqa* «the belt»; Alnitak is النطاق *al-niṭāq*, «the girdle» and Alnilam is النظام *al-niẓām* «the regularity» or «the string of pearls» (Davies 1944: 23; Wehr 1976: 974, 978).

The Arabic titles of those stars are comparable and currently used individually, however the Arabs applied the names to all three inseparably (Allen 1963: 315). This brings light to understanding the notion of the Belt or the String not as single points, but rather a straight line composed of three similarly bright stars. Especially to a medieval viewer using eyes unaided by magnifying instruments.

2.23.5 SAIPH (Kappa Orionis)

Originally named رجل الجوزاء اليمنى *riġl al-ġawzā' al-yumnā* «the right leg of the giant», Kappa has inappropriately³⁴ changed its meaning to سيف *sayf*, «sword» (Allen 1963: 313). Drawings of Orion often include a long sheathed sword attached to his belt marked by Saiph (illustration 2.23.1).

2.23.6 MEISSA (Lambda Orionis)

The star marking the «head of the giant» رأس الجوزاء *ra's al-ġawzā'*. The name, however, had not maintained and has been superseded by الهقعة *al-haq'a* «the white spot», which refers to a faint light of another star in the background of Meissa.

The etymology of the name we use now goes back to an error made in 14th century supposedly by Arabian lexicographer Al Firuzabadi. He mistook the title of Alhena (Gemini Geminorum), which then was الميسان *al-maysān* «the shining one» and applied it to Lambda Orionis (Allen 1963: 318).

³⁴ “Al-Tizini designated ι as Nā'ir as-Sayf, the Bright One in the Sword, but it is practically unnamed with us, although far more deserving of the title Saiph than is the succeeding star kappa” (Allen 1963: 313).



Illustration 2.23.1 Orion as imagined in the *Book of Fixed Stars* (As-Sufi 1417: 281).

2.24 PEGASUS

2.24.1 MARKAB (Alpha Pegasi)

In Arabic Markab is مركب *markab* «saddle», «ship» or essentially «anything ridden upon». In spite of such a diversity of meanings that may be associated with the title, a saddle seems to be the most representative. Especially that Alpha Pegasi is situated on the horse's back³⁵ (Davies 1944: 24; Lane 1863: 1145; Wehr 1976: 356).

2.24.2 SCHEAT (Beta Pegasi)

According to Allen, the traditional name of modern star catalogues could have come from الساعد *as-sā'id* «the forearm» (1963: 325). Yet Davies claims it comes from الساق *as-sāq* «the leg» (1944: 24). It could be a corrupted transliteration that is responsible for the development to the current form Scheat.

2.24.3 ALGENIB (Gamma Pegasi)

It would be convenient if the star's label was derived from Arabic جناح *al-ġanāḥ* «the wing», as it marks the tip of the wing of the Pegasus. However, it was much more likely derived from الجانب *al-ġānib* «the side» (Allen 1963: 325). This may lead to a speculation whether the constellation of Pegasus was adopted from Ptolemy.

2.24.4 ENIF (Epsilon Pegasi)

Undoubtedly, the form indicates Arabic انف *anf* «nose» (Davies 1944: 24). Not only thanks to the fact that the transliteration is accurate, but also when it comes to visual representations of Pegasus, Enif always marks the nose (illustration 2.10.1) (As-Sufi 1513: 93).

2.24.5 HOMAM (Zeta Pegasi)

Homam is claimed to come from the phrase سعد الهمام *sa'd al-humām* «the lucky star of the hero» (As-Sufi 1417: 142).

This Arabic Sa'd is our "Good Luck" and a component word of many titles in the Desert sky, all of which seem to have been applied to stars rising in the morning twilight at the commencement of the pleasant season of spring. Al Sa'dain, the dual form, was the title for Jupiter and Venus, the Two Fortunate Planets; Al Nahsān, the Unlucky, referring to Mars and Saturn (Allen, 1963: 329).

It is also mentioned as الهمام *al-hammām* «the whisperer» (Allen 1963: 328).

35 To Arab astronomers the Greek Pegasus was a horse before the introduction of Ptolemaic constellations.



Illustration 2.24.1: Pegasus from *Book of Fixed Stars* (As-Sufi 1513: 93).

2.24.6 MATAR (Eta Pegasi)

Originated as سعد المطر *sa'd al-maṭar* «the lucky star of the rain» or «the fortunate rain» it is currently known under the common word مطر *maṭar* «rain» (Allen 1963: 328; As-Sufi 1417: 142; Davies 1944: 24)

2.24.7 BAHAM (Theta Pegasi)

Possibly from سعد البهائم *sa'd al-bahā'im* «good luck of the beasts». *bahā'im* is the plural form of بهيمة *bahīma* «beast». The second of the beasts is Nu Persei, a dimmer star in close proximity to Theta Pegasi (Allen 1963: 328; Davies 1944: 24).

2.24.8 SADALBARI (Lambda Pegasi)

The designation is derived from the phrase سعد البارع *sa'd al-bārī'* «good luck of the one excelling in knowledge and virtue» (Davies 1944: 24).

2.25 PERSEUS

2.25.1 MIRFAK (Alpha Persei)

From مرفق الثريا *mirfaq, marfiq* «elbow». It was adopted from the phrase مرفق الثريا *mirfaq at-turiyyā* «the elbow of the pleiades». Bright cluster of the Pleiades³⁶ was the center of an ancient Arabic constellation and Alpha Persei was a part of *the outstretched right hand of the Pleiades*. (Davies 1944: 25; Higgins 1882: 27; Wehr 1976: 351).

The star was also named Algenib, which is the title of Gamma Pegasi as well (see 2.24.3 ALGENIB).

2.25.2 ALGOL (Beta Persei)

One of the best known stars for its extraordinary attributes³⁷. The name Algol originated as رأس الغول *ra'as al-ġūl* «the demon's head» The title has probably been adopted from Ptolemy where Algol represented Medusa's head held by Perseus. In English it is commonly called Demon Star and regarded as unlucky (Allen 1963: 332; Sufi 1417: 102).

2.25.3 MENKIB (Xi Persei)

From منكب الثريا *mankib at-turiyyā* «the shoulder of the pleiades». Refers to the same figure as Alpha Persei (Davies 1944: 25; Wehr 1976: 997).

2.25.4 ATIK (Omicron Persei)

Synonymous to Xi, عاتق الثريا *ātiq at-turiyyā* «the shoulder of the pleiades» (Davies 1944:

36 See 2.28.1

37 It is a highly variable star with significant change of brightness every 3 days (Kaler 1999).

25; Wehr 1976: 589)³⁸.

2.26 PISCES

2.26.1 ALRESCHA (Alpha Piscium)

Derived from الرشاء *ar-rišā'* «the cord» or «the rope» (Allen 1963: 342; Wehr 1976: 342).

2.26.2 FUM AL SAMAKAH (Beta Piscum)

From فم السمكة *famm as-samaka* «the fish's mouth» (Allen 1963: 343; Kaler 1999).

2.27 SAGITTA

2.27.1 SHAM (Alpha Sagittae)

From سهم *sahm* «an arrow». It is also the name for the whole faint constellation representing an arrow shot by Sagittarius (the archer) (Kaler 1999; Wehr 1976: 438).

2.28 TAURUS

2.28.1 ALDEBARAN (Alpha Tauri)

From الدبران *al-dabarān* «the follower», presumably because it seems to follow the Seven Sisters – a very distinctive star cluster known as Pleiades (As-Sufi 1417: 178; Kaler 1999).

The title could be connected with the term دبر *dabar* «a tract of the western sky at sunset». From the Arabic-English Lexicon by Edward William Lane:

إِذَا رَأَيْتَ النَّوْثِيَّ بِدَبْرِ فَشَهْرٌ نَبَاجٌ وَشَهْرٌ مَطَرٌ وَإِذَا رَأَيْتَ الشَّعْرَى بِقَبْلِ فَمَجْدُ
فَتَى وَجَمَلٌ جَمَلٌ meaning *When thou seest the Pleiades near to setting with
sunset, then [is a month which] is a time of breeding of camels, and [a
month which is] a time of rain: and when thou seest Sirius [near to
rising] with sunset, [then is the glory of the generous man, and the time
for the burden of the full-grown he- camel]* (Lane 1863: 845).

Perhaps Alpha Tauri came to be associated with this region, as it was the brightest star in site, and inherited the title, thus becoming Aldebaran.

2.28.2 ELNATH (Beta Tauri)

Interchangeably with Al Nath, it is from الناطح *an-nāṭih* «the one butting with horns» (Davies 1944: 27; Wehr 1976: 973)

³⁸ Dimmer stars of the constellation were also a part of *at-turiyyā*, but we did not inherit their titles (Davies 1944: 25).

2.28.3 AIN (Epsilon Tauri)

Ain lies where the bull's eye is and that is exactly what its name means. From عين 'ayn «eye» (Kaler 1999).

2.29 TRIANGULUM

2.29.1 MOTHALLAH (Alpha Trianguli)

The traditional name Mothallah or Muthallah is a derivative translation of the Latin Caput Trianguli into رأس المثلث *ra'as al-muṭallaṭ* «head of the triangle» (Allen 1963: 416; Wehr 1976: 105).

2.30. URSA MAJOR

2.30.1 DUBHE (Alpha Ursae Majoris)

The brightest star of the Large Bear (Ursae Major) is referred to with Latin Dubhe (Kunitzsch 1959: 158). It comes from the Arabic ظهر الدب الأكبر *zahr ad-dubb al-'akbar* «the back of the greater bear» through an abbreviated form دب *dubb* «bear» (Allen 2003, 437). As Przemysław Turek presumes, the form Dubhe could have had its origin in word دبة *dubba*, a hypothetical feminine form of «bear», *hē 'árktos* in Greek (2003: 191).

2.30.2 MERAK (Beta Ursae Majoris)

It comes from المراق *al-marāqq* «the loin of the bear» (Allen 1963: 438).

2.30.3 PHECDA (Gamma Ursae Majoris)

Derived from فخذ *al-fahid*, «the thigh» from فخذ الدب الأكبر *fahid ad-dubb al-akbar* «the thigh of the greater bear» (Allen 1963: 438; Wehr 1976: 699).

2.30.4 MEGREZ (Delta Ursae Majoris)

مغرز ذنب الدب الأكبر *magraz ḍanab ad-dubb al-'akbar* «root of the tail of the greater bear» (Wehr 1976: 312; Davis 1944: 27).

2.30.5 ALIOTH (Epsilon Ursae Majoris)

With a rich history and many derivations there are quite a few possibilities. The one representing today's version in the most accurate way is اليات *alya*, a plural form of الية *alyāt* «fat of the tail of a sheep», introduced by Scaliger. In this case, syllable *al* does not represent the Arabic definite article as it usually does, taking other star names under consideration (Allen 1963: 439; Lane 1863: 87). Another one is الحور *al-ḥawar* «the

extremely bright one» (Davies 1944: 28). Davies claims that Alioth is a ridiculously corrupt form of عيوق *‘ayyūq*, an old Arabic proper name of Capella (Alpha Aurigae) (1944: 27).

2.30.6 MIZAR (Zeta Ursae Majoris)

As suggested by Allen, Zeta Ursae Majoris was named with the same title as Merak (Beta Ursae Majoris), which was later inappropriately changed to Mizar by Scaliger. It comes from the Arabic منزر *mi'zar*, «a girdle» or «waist-cloth» (1963: 440).

Being only 11'48" apart from another star, Alcor, those two were treated as eyesight practice for Bedouins. Seeing both stars with naked eye proved one's good eyesight.

2.30.7 ALKAID, BENATNASH (Eta Ursae Majoris)

The first star of the Big Dipper's handle is known by two titles, both of which are derived from the same phrase قائد البنات النعش *qā'id al-banāt an-na's* «the leader of the daughters of the bier» (Wehr 796: 979). Known as well as the Mourning Maidens, Alkaid, Mizar and Alioth stand in front of the bier, represented by Megrez, Phecda, Merak, and Dubhe. (Brill 1987, 1078; Sufi 1417: 45).

2.30.8 TALITHA BOR, TALITHA AUS, TANIA BOR, TANIA AUS, ALULA BOR, ALULA AUS (Iota, Kappa, Lambda, Mu, Nu, Xi Ursae Majoris)

Names of those six stars all refer to leaps of an antelope or a gazelle. The pattern formed by the dots forms what has been considered a trace left by the animal. Talitha is ثالثة *tālīta*, «third (leap)». Australis and Borealis (Aus and Bor) are Latin equivalents for South and North. Tania ثانية *tāniya*, «second (leap)» and Alula الأول *al-'ula*, «first (leap)» (Kaler 1999).

2.31. URSA MINOR

2.31.1 KOCHAB (Beta Ursae Minoris)

Etymologically, the name originated from Arabic الكوكب الشمالي *al-kaukab al-šamālī*, which stands as «the north star»³⁹. The word كوكب is now the common Arabic equivalent for the word *star* (Davies 1944: 29; Wehr 1976: 846).

Passage of time changes the position of the celestial equator. This leads to understanding that the North Star, a title for the center of northern sky, is now the name for

39 „Kazwini mentioned belief of the common people that a fixed contemplation of Al Kaukab would cure itching of the eyelids, — ophthalmia, then, as now, being the prevalent disease of the Desert” (Allen 1963: 458).

Beta rather than Alpha (Polaris Ursae Minoris), the actual current center.

Earlier it was even more familiar to the Arabs as another Bier⁴⁰; and they called the three stars in the tail of the figure البنات النعش الصغرى *al-banāt an-na ʿaṣ-ṣuġrā* «the daughters of the lesser bier» (Bouw 2002: 8).

2.31.2 PHERKAD (Gamma Ursae Minoris)

Pherkad comes from Arabic فرقد *farqad* «calf» (Wehr 1976: 709), which derives from أخفى الفرقدين *ʾahfā al-farqadayn* «the dimmer of the two calves». The other calf is said to have been Kochab (Beta Ursae Minoris), the earlier name of which is انوار الفرقدين *ʾanwār al-farqadayn* «the brighter of the two calves»⁴¹ (Allen 1963: 459-460; Kaler 1999).

40 Similarly to the bigger bier formed by the Big Dipper (see 2.30.7)

41 Together, the two stars are also known as the Guardians of the Pole, as both are bright and circulate close around Polaris.

CHAPTER 3: CONCLUSIONS

The study shows how Arabic entered the international astronomy. Throughout the centuries the Arabic names evolved, were translated back and forth on multiple occasions. Now, they are approved worldwide and have become a living heritage of ancient cultures.

Understanding the meanings of names given many centuries ago proved to be an interesting pursuit. Numerous names altered their forms and in many cases became corrupted along the way of being adopted into astronomical nomenclature. It is an actual challenge to trace those names back to their original meanings. Fortunately, it is not an unfamiliar field to scholars. On the other hand, the more individuals engage in the subject the more different variants of a star name's origin appear. To see the problem from a linguistic point of view provides a unique opportunity to elaborate on this field. Many scholars, including Allen, who produced an extensive research on star name etymology had no knowledge of Arabic. In which case it may result in copy erroneous forms of phrases suggested in older resources. An example of this may be observed in names composed of the Arabic genitive construction – idafa. Multiple sources provide incorrect forms, which overuse the definite article *al-* in the first unit of idafa where under no circumstances should it be. It is now very common that popular internet encyclopedias, for instance Wikipedia, include those incorrect phrases. Another issue concerning mistakes in the development of star titles is a faulty transcription. Scholars of the past responsible for transliterating the names from Arabic to Latin had a tendency to simplify. As of today, the debate on one uniform system of transcription for Arabic is still not resolved. As a result, there are versions differing in transcription format, which does not help the research on the origin of star names.

Famous traditional designations for stars outlasted numerous generations of man. Even to As-Sufi, who lived during the 10th century, certain names were too old to understand their meanings and origin fully⁴². Many of them have been lost, but some have endured and are now unlikely to be forgotten. As the names that once were Arabic passed the test of time - it may be hoped - they will outlive many generations to come.

42 Babylonians created star lists that are dated to 687 BC. They were based on Sumerian constellations from about 2000 BC (Ridpath chap. 1, Stars and storrtellers).

REFERENCES

As-Sufii, ‘Abd al-Rahman ibn ‘Umar. 1417. كتاب صور الكواكب. Accessed September 20, 2013.

<http://www.wdl.org/en/item/2484/>

As-Sufii, ‘Abd al-Rahman ibn ‘Umar. 1513. كتاب صور الكواكب. Accessed September 20, 2013.

<http://expositions.bnf.fr/islam/gallica/arabe4.htm>

Allen, R. H. 1963. *Star Names — Their Lore and Meaning*. Dover: Dover Publications.

Bakich, M. E. 1995. *The Cambridge guide to the constellations*. Cambridge University Press.

Brill, E. J. 1987. *E.J. Brill's First Encyclopaedia of Islam 1913-1936*. Brill.

Bouw, G. D. 2002. *Draco the Dragon*. *Biblical Astronomer* 100: 51-58. Accessed September 20, 2013.

<http://www.geocentricity.com/constellations/>

Bouw, G. D. 2005. The Ursas. *Biblical Astronomer* 111: 5-14. Accessed September 20, 2013.

<http://www.geocentricity.com/constellations/>

Cannon, G. H. 1994. *The Arabic Contributions to the English Language: An Historical Dictionary*, Wiesbaden: Harrassowitz.

Danecki, J. 1994. *Gramatyka Języka Arabskiego*. Warszawa: Wydawnictwo Akademickie Dialog.

Davies, G. A. JR. 1944. *The Pronunciations, Derivations, and Meanings of a Selected List*

of *Star Names*. *Popular Astronomy* 52: 8-30. Accessed September 20, 2013.
<http://articles.adsabs.harvard.edu//full/1944PA.....52...8D/0000030.000.html>

Gibson, S. *Star Names*. Accessed September 20, 2013.
<http://www.naic.edu/~gibson/starnames/>

Gingerich, O. 1986. *Islamic Astronomy*. *Scientific American* 254: 74-83. Accessed September 20, 2013. doi:10.1038/scientificamerican0486-74.

Gingerich, O. 1987. *Zoomorphic Astrolabes and the Introduction of Arabic Star Names into Europe*. *Annals of the New York Academy of Sciences* 500: 89-104. Accessed September 20, 2013. doi:10.1111/j.1749-6632.1987.tb37197.x.

Hafez, I., F. R. Stephenson, and W. Orchiston. 2011. *Abdul-Ramān al-Şūfī and His Book of the Fixed Stars: A Journey of Re-discovery* In *Highlighting the History of Astronomy in the Asia-Pacific Region: Proceedings of the ICOA-6 Conference*, edited by Wayne Orchiston, 121-138. New York: Springer.

Higgins, W. H. 1882. *The names of the stars and constellations compiled from the Latin, Greek, and Arabic; with their derivations and meanings*. London: Hamilton, Adams, & CO.

Kaler, J. 1999. *Stars*. Accessed September 20, 2013.
<http://stars.astro.illinois.edu/sow/sowlist.html>

Knobel, E. B. 1917. *Ulugh Beg's Catalogue of Stars*. Washington: The Carnegie Institution of Washington.

Knobel, E. B. 1895. *On a Catalogue of Stars in the Calendarium of Al Achsasi Al Mouakket*. *Monthly Notices of the Royal Astronomical Society* 55: 429-438.

Kunitzsch, P. 1987. *Peter Apian and Azophi - Arabic Constellations in Renaissance*

Astronomy. Journal for the History of Astronomy 18: 117-124.

<http://articles.adsabs.harvard.edu//full/1987JHA....18..117K/0000120.000.html>

Kunitzsch, P. 1959. *Arabische Sternnamen in Europa*. Wiesbaden: Harrossowitz.

Kunitzsch, P., and T. Smart. 2006. *A Dictionary of Modern star Names: A Short Guide to 254 Star Names and Their Derivations* (2nd ed.). Cambridge, MA: Sky Publishing.

Lane, E. W. 1863. *Arabic-English Lexicon*. London: Willams & Norgate. Accessed September 20, 2013.

<http://www.tyndalearchive.com/tabs/lane/>

Lebling, R. W. 2010. *Arabic in the Sky*. Saudi Aramco World September/October 2010: 24-33. Accessed September 20, 2013.

<http://www.saudiaramcoworld.com/issue/201005/arabic.in.the.sky.htm>

Odeh, M. 1998. *Arabic Star Names* Accessed September 20, 2013.

<http://www.icoproject.org/star.html>

Pachniak, K. 2010. *Nauka i kultura muzułmańska i jej wpływ na średniowieczną Europę*. Warszawa: Trio.

Pittich, E., and D. Kalmančok. 1990. *Niebo na dłoni*. Warszawa: Wiedza Powszechna.

Rhoads, J. W. 1971. *Technical Memorandum 33-507 A Reduced Star Catalog Containing 537 Named Stars*. California: Jet Propulsion Laboratory, California Institute of Technology. Accessed September 20, 2013.

http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19720005197_1972005197.pdf

Ridpath, I. *Star Tales* Accessed September 20, 2013.

<http://www.ianridpath.com/startales/contents.htm>

Rogers, J. H. 1998. *Origins of the ancient constellations: I. The Mesopotamian traditions*.

Journal of the British Astronomical Association no.1 108: 9–28.

Rumrill, H. B. 1936. *Star Name Pronunciation*. Publications of the Astronomical Society of the Pacific 48: 139-154. Accessed September 20, 2013.

<http://adsabs.harvard.edu/full/1936PASP..48..139R>

Staal, J. D. W. 1988. *The New Patterns in the Sky: Myths and Legends of the Stars*. McDonald & Woodward Pub Co.

Thompson, G. D. 2006. *Modern Western Constellations*. Accessed September 20, 2013.

<http://members.westnet.com.au/gary-david-thompson/page11-26.html>

Thompson, G. D. 2001. *Studies of Occidental Constellations and Star Names to the Classical Period: An Annotated Bibliography*. Accessed September 20, 2013.

<http://members.westnet.com.au/Gary-David-Thompson/page5.html>

Turek, W. P. 2003. *Gwiazdy o nazwach pochodzenia arabskiego na polskim niebie*. Przegląd orientalistyczny 3-4: 187-195.

Vonnegut, K. *Constellations: Hercules 'the Strongman'*. Accessed September 20, 2013.

http://h2g2.com/approved_entry/A29778916

Wehr, H. 1976. *A Dictionary of Modern Written Arabic*. New York: Spoken Language Services, Inc.

White, G. 2008. *Babylonian Star-lore*. London: Solaria Publications.

World Digital Library. 2011. *Book of the Alphonsine Tables*. Last modified November 9 2011. Accessed September 20, 2013.

<http://www.wdl.org/en/item/7326/#q=alfonsine+tables&qla=en>