the lesser wain
Is twisting round the polar star,—

one of the Greater Bear's titles being the Twister; and in the **Lazy Team,** a designation that it still more deserves than does Ursa Major.

In Proctor's attempt to reform constellation names he calls this simply **Minor,** the Greater Bear being **Ursa.**

Ursa Minor, as now drawn, is inclosed on three sides by the coils of Draco; formerly it was almost entirely so. Argelander here enumerates 27 stars down to the 5½ magnitude, and Heis 54.

one unchangeable upon a throne
Broods o'er the frozen heart of earth alone,
Content to reign the bright particular star
Of some who wander and of some who groan.
Christina G. Rossetti's *Later Life.*

α, Double, 2.2 and 9.5, topaz yellow and pale white.

Phœnice was the early Greek name, borrowed from its constellation, for this "lovely northern light" and the "most practically useful star in the heavens"; but for many centuries it has been **Stella Polaris,** the **Pole-star,** or simply **Polaris,**— Riccioli's **Pollaris;** this position seeming to be first recognized in literature by Dante when he wrote in the *Paradiso:*

the mouth imagine of the horn
That in the point beginneth of the axis
Round about which the primal wheel revolves.

Euclid said in his *Phainomena:*

A star is visible between the Bears, not changing its place, but always revolving upon itself;

Hipparchos, that the pole was "in a vacant spot forming a quadrangle with three other stars," both of these calling this Πόλος, the *Polus* of Lucan, Ovid, and other classical Latins; and Euphratean observers had called their pole-star **Pūl,** or **Bīl.** But, although other astronomical writers used these words for some individual star, there is no certainty as to which was intended, for it should be remembered that during many millenniums the polar point has gradually been approaching our pole-star, which 2000 years ago was far removed from it,—in Hipparchos' time 12° 24′ away according to his own statement quoted by Marinus of Tyre and cited by Ptolemy. Miss Clerke writes as to this:

The entire millennium before the Christian era may count for an interregnum as regards Pole-stars. Alpha Draconis had ceased to exercise that office; Alruccabah had not yet assumed it.

Kochab (the β of Ursa Minor), and κ of Draco, at different times in that epoch, may have been considered as this pole-star, the last a 4th-magnitude about 10° distant from the true pole; although the 5th-magnitude b, 4° away in Eratosthenes' day, perhaps was intended. And this is not unlikely, as this inconspicuous object, for some reason, was sufficiently noteworthy among the Chinese to bear the title How Kung, the Empress. The ἀεὶ φανής, "ever visible," of the 5th-century Stobaeus may have referred to our Polaris, then about 7° distant from the pole.

The fact that the Polaris of his day did not exactly mark the pole was noted by Pytheas, the Greek astronomer and navigator of Massilia, the modern Marseilles, about 320 B. C.; and till this discovery the belief was prevalent that the heavenly pole was absolutely fixed.

In none of the foregoing cases does a single star seem to be mentioned as a guide in navigation; but as knowledge in this art increased, our α took the place of its constellation as **Stella Maris**, a title that Saint Jerome, in his *Onomasticon*, applied to the Virgin Mary; there, however, with no marine, or stellar, connection. But a star, being always a symbol of sanctity, was peculiarly so of the holiest of women, so that this title of the chief star of heaven was adopted as one interpretation of her Jewish name Miriam.

Bayer's **la Tramontana** was well known before his day, for Eden translated from the *First Decade*, printed in 1511, "cauled by the Italians Tramontana"; and Jehan de Mandeville ("syr Iohn Maundauile") more than a century before the discovery of our continent, in his statement of his belief in the sphericity of the earth, wrote of it as

the **Sterre Transmontane**, that is clept the **Sterre of the See**, that is unmevable, and that is toward the Northe, that we clepen the **Lode Sterre**.

One derivation of this *transmontane* is from the fact that the nations along the Mediterranean saw the star beyond their northern mountain boundary; and the word appears in the popular saying, current among the Latin races, of a man's "losing his Tramontane" when one had lost his bearings. Another earlier and much more probable origin, however, is from a title for the constellation already alluded to. Similarly the Finns know Polaris as **Taehti**, the Star at the Top of the Heavenly Mountain.

Anglo-Saxons of the 10th century said that it was the **Scip-steorra**, the Ship-star; Eden, "cauled of the Spanyardes **Nortes**"; Bayer, **Angel Stern**, the

Pivot Star, and the Latin **Navigatoria**; while it was the **Steering Star** to early English navigators, who

knew no North, but when the Pole Star shone.

Andrew Marvell, strangely the common friend of John Milton and King Charles II, said:

By night the northern star their way directs;

and Thomas Moore wrote, in his *Light of the Haram:*

that star, on starry nights
The seaman singles from the sky
To steer his bark for ever by.

Thus, as the leading star, it became the **Loadstar,** or **Lodestar,** of early English authors; Spenser saying:

The pilot can no loadstar see,

and Shakespeare's Helena, in *A Midsummer Night's Dream*, tells Hermia

Your eyes are lodestars.

Bryant beautifully alludes to its office in these verses from his *Hymn to the North Star:*

Constellations come, and climb the heavens, and go.
Star of the Pole! and thou dost see them set.
Alone in thy cold skies,
Thou keep'st thy old unmoving station yet,
Nor join'st the dances of that glittering train,
Nor dipp'st thy virgin orb in the blue western main.

On thy unaltering blaze
The half wrecked mariner, his compass lost,
Fixes his steady gaze,
And steers, undoubting, to the friendly coast;
And they who stray in perilous wastes by night,
Are glad when thou dost shine to guide their footsteps right.

A beauteous type of that unchanging good,
That bright eternal beacon, by whose ray
The voyager of time should shape his heedful way.

And Wordsworth, in the *Excursion*, thus goes back to the earliest times:

Chaldaean shepherds, ranging trackless fields,
Beneath the concave of unclouded skies
Spread like a sea, in boundless solitude,

Looked on the polar star, as on a guide
And guardian of their course, that never closed
His steadfast eye.

Milton's *Comus* had the much quoted

Our Star of Arcady,
Or Tyrian Cynosure;

and *L'Allegro:*

The Cynosure of neighb'ring eyes,—

a designation of Polaris which has everywhere become common; while **Cinosura** and **Cynosura** regularly appeared in scientific works of the 17th and 18th centuries; but this was one of the ancients' titles for the whole of Ursa Minor, and never, by them, limited to the *lucida*. The **Star of Arcady** either referred to Arcadia, the earthly home of Kallisto, or to Arcas, her son, transferred to the skies by his father Jove, when ignorantly about to slay his mother after her transformation. The poet, however, followed a common error in locating Arcas here, for he properly was identified with Boötes.

The Chinese had several names for it,— **Pih Keih; Ta Shin; Tien Hwang Ta Ti,** the Great Imperial Ruler of Heaven, the circumpolar stars circling around it in homage, the whole forming the **Purple Subtle Enclosure;** and **Ti** or **Ti Tso,** the Emperor's Seat, this last also being borne by *a* Herculis. And it was **Tow Kwei,** as with Ursa Major, from its square of stars, β, γ, ζ, and η. Its first use in navigation is ascribed to their emperor Hong Ti, or Hwang Ti, a grandson of Noah! However this may be, it seems certain that some polar star, or constellation, has been used in China from remote antiquity.

In earliest Northern India the star nearest the pole was known as **Grahadhāra,** the Pivot of the Planets, representing the great god Dhruva, and Al Bīrūnī said that among the Hindus of his time it was **Dhruva** himself. It was an object of their worship, as our Polaris is to-day among the Mandaeans[1] along the Tigris and lower Euphrates.

The Arabs knew Polaris as **Al Ḳiblah,** "because it is the star least distant from the pole," although then 5° away, and helped them, in any strange location distant from an established place of worship, to know the points

[1] This strange people, fast dwindling to extinction, are also known as Nasoraeans, or Saint John Christians. In their representation

the sky is an ocean of water, pure and clear, but of more than adamantine solidity, upon which the stars and planets sail. Its transparency allows us to see even to the pole-star, who is the central sun around whom all the heavenly bodies move. Wearing a jewelled crown, he stands before Abāthūr's door at the gate of the world of light; the Mandaeans accordingly invariably pray with their faces turned northward.

of the compass and thus the direction of Mecca and its Ka'bah,[1] towards which every good Muslim must turn his head in prayer. They also called it **Al Jadi, the Young He Goat,** which subsequently degenerated to **Juddah,** as Niebuhr heard it a century ago, and known in Desert story as **Giedi,** the slayer of the dead man on the Bier of Ursa Major.

Wetzstein says that in Damascus it is called **Mismār,** a Needle or Nail.

As marking the north pole it bore the latter's title, **Al Ḳuṭb al Shamāliyy,** the Northern Axle, or Spindle, from Al Ḳuṭb, the Pin fixed in the under stone of a mill around which the upper stone turns; and this same thought later appeared in English poetry, as in Marlowe's *History of Doctor Faustus*, where he says of the stars that

> All jointly move upon one axletree
> Whose terminine is term'd the world's wide pole.

The Arabian astronomers knew it as **Al Kaukab**[2] **al Shamāliyy,** the Star of the North, an appellation perhaps given by their nomad ancestors to β as nearer the pole in their time.

Kazwini mentioned the 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.

The *Alfonsine Tables* of 1521 have **Alrucaba** *et est Stella polaris sive Polus;* and Bayer, **Alruccabah** *seu* **Ruccabah** *Ismaelitis*; but this was shared with the next star, as also with the constellation.

The Turks know it as **Yilduz,** the Star *par excellence;* and have a story that its light was concealed for a time after their capture of Constantinople.

Polaris is 1° 14′ distant from the exact pole, which lies on the straight line drawn from Polaris to ζ Ursae Majoris, and will continue in gradual approach to the pole till about the year 2095, when it will be only 26′ 30″

[1] This ancient Square House, probably an early Sabaean temple, was built, tradition says, first in heaven; then for Adam on earth as a tabernacle of radiant clouds let down by the angels directly under its celestial site. This, disappearing at his death, was replaced by one of stone and clay by the patriarch Seth, that in its turn was swept away by the Deluge. Lastly it was erected by Abraham and Ishmael to contain the Black Stone, Al Ḥajar al Aswad, a ruby, or jacinth, brought from heaven by Gabriel and now blackened by the pilgrims' tears, or because so often kissed by sinners; but it is generally regarded by unbelievers as a meteorite. The *Century Cyclopedia*, however, describes it as an irregular oval about seven inches in diameter, composed of about a dozen smaller stones of various shapes and sizes. The Stone is set into the northeast corner of the wall, at a convenient height for kissing.

[2] Kaukab is the same as the Assyrian and Chaldaean word Kakkab, the Hebrew Kōḥābh; this last also the fighting name of Bar Cochab, the Son of a Star, who was the leader of the second revolt of the Jews in 132-135, during the reign of Hadrian, his *shekels* bearing a star over a tetrastyle temple. The name was variously written, but correctly as Bar Coziba, from his birthplace.

away. It will then recede in favor successively of γ, π, ζ, ν, and α of Cepheus, α and δ of the Swan, and Wega of the Lyre, when, marked by this last brilliant star, 11,500 years hence the pole will be about 50° distant from its present position and within 5° of Wega, which for 3000 years will serve as the pole-star of the then existing races of mankind. The polar point will thence circle past ι and τ Herculis, θ, ι, and a Draconis, β Ursae Minoris, and κ Draconis back to our α again; the entire period being from 25,695 to 25,868 years, according to different calculations.[1] Shakespeare did not know all this when he wrote in *Julius Caesar:*

> constant as the Northern Star,
> Of whose true fixed and resting quality
> There is no fellow in the firmament.

Its distance from us has been variously estimated from 36 to 63 light years, and it is receding from our system at the rate of about 16 miles a second. The spectrum is Sirian.

The 9½-magnitude companion, 18″.6 distant, is a good test for a 2¼-inch glass with a power of 80. This was discovered by Sir William Herschel in 1779, and may be in revolution around its principal. Its present position angle is 215°. Other minute stars can be seen with a field-glass in the vicinity; and the Messrs. Henry of Paris have charted by photography 1270 stars, within 1° of the pole, where previously only about 80 were known by telescopic observation. α itself is slightly fainter than β.

While Polaris is the nearest naked-eye visible to the true pole, Smyth mentioned a nebula, now known as N. G. C. 3172, much nearer in 1843, and from its proximity called **Polarissima;** while nearer still was a 10th-magnitude star bearing the warlike title **Blücher,** then within 2′ of the exact point. Poole's *Celestial Handbook* says of some unidentified star:

Anonyma — Double: magnitudes 7.5 and 9; distance 2′; it is the nearest to the pole.

β, 2, reddish.

Kochab is from the Arabic title that it shared with α; and it perhaps was this star that the Greek astronomers called Πόλος, for it was near the pole 1000 years before our era. Burritt has **Kochah.**

Alrucaba, variously written, is also common to it and Polaris, as well as to its constellation, Smyth saying that this was the *Alfonsine* **Reicchabba.**

[1] This uncertainty in the period of the cycle of precession mainly arises from the fact that the circle is not a strictly closed one, owing to the slight motion of the pole of the ecliptic due to the action of the planets upon the orbit of the earth.