

Hakeem Omar Khayyam

Philosopher, astronomer, mathematician, and poet

Manu Malek, Ph.D.
Industry Professor
Department of Computer Science
<http://www.cs.stevens.edu/~mmalek/>

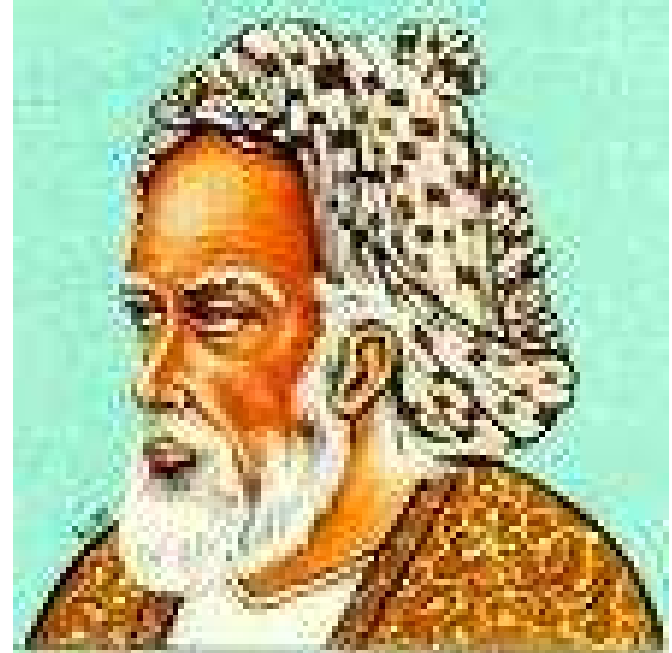
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Outline

- ❖ Khayyam's Life
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- ❖ Khayyam's Scientific Works
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About Khayyam

- ❖ Hakeem Omar Khayyam is a prominent Iranian (Persian) philosopher, astronomer, mathematician, and poet.
- ❖ He was born in Neishabur, Khorasan, a northeastern province of Iran.
- ❖ He also lived in Balkh and Esfahan for some time and had trips to Samarkand, and Harat, all parts of Iran at the time.
- ❖ His father was a tent maker in Neishabur, thus his pen-name of Khayyam.



Omar Khayyam
(1048 – 1131 AD)

About Khayyam (cont'd)

- ❖ The majority of his scientific work was written in Arabic which was the scientific language during his time.
- ❖ His sublime poetry, known as *Robaiyat*, and some of his philosophical essays were written in Persian (Farsi), his native language.



Khayyam's tomb,
Neishabur

Khayyam, Hasan Sabbah and Nezam-ol-molk

- ❖ Khayyam was a student of Imam Movaffak of Neishabur, a highly revered teacher whose students also included Hasan Sabbah and Khajeh Nezam-ol-molk.
- ❖ Nezam went on to become the Grand Vazir of Alp Arsalan and his son Jalal-ed-din Malekshah of the Saljuq dynasty.
- ❖ The two friends came to him and Nezam gave both of them places in the government.
- ❖ Hasan schemed to supplant Nezam, but failed and was disgraced. He went on to create the Persian sect of Ismailis.
- ❖ Khayyam, at his request, was given a stipend to have a comfortable life to "spread wide the advantages of science".

Khayyam as a Poet

- ❖ Khayyam wrote short pieces of poetry known as *Robaiyat* (quatrains) as a hobby.
- ❖ Robaiyat are independent stanzas consisting of four lines of equal prosody, sometimes all four rhyming, but often only the 1st, 2nd, and 4th rhyming.
- ❖ Robaiy is a particularly difficult form of Persian poetry as the poet must provide a complete meaning in a short segment.
- ❖ Khayyam is not considered a master poet in the ranks of great Persian poets like Ferdowsi, Nezami, Rumi, Saadi, and Hafez. However, he is considered the most prominent Robaiy composer.
- ❖ Apparently, he was not even known as a poet during his life time. He received some fame as a poet when his poetry was collected after his death.

Khayyam's *Robaiyat*

- ❖ Khayyam's Robaiys are simple, but clear, eloquent, and with deep meaning.
- ❖ He is serious and firm in his poems, does not refer to any person and does not jest, praise, or lampoon.
- ❖ Many others imitated his style and meaning, and wrote Robaiys which are sometimes mistakenly attributed to him. His genuine Robaiys are believed to number less than 100.
- ❖ Researchers have used many techniques to weed out Robaiys not likely written by him. They include Iranian literary experts like Forooghi, Ghani, Nafisi, as well as non-Iranians like Valentine Zhukofsky (Russian), Frederich Rosen (German), Arthur Christiansen (Danish), and Edward Fitzgerald (British).
- ❖ Khayyam's Robaiys have been translated into more than 30 languages.

Messages in *Robaiyat*

- ❖ Khayyam packs a lot of wisdom and advice in his Robaiys. They are told in the language of wine, love, flowers, and nature.
- ❖ There are several recurring concepts/messages in his Robaiys:
 - *Mystery of life*
 - *The inevitability of death*
 - *Seize the moment; no return after death*
 - *Drinking wine*
 - *Nothing is pre-ordained*
- ❖ Some attribute Khayyam's poetry to Sufism. Although some of his thoughts, such as drinking wine, may coincide with Sufi thoughts, but Sufis embrace death while Khayyam laments about death. In fact, it is believed that Khayyam was hated by the Sufis, whose practices he ridiculed.

Mystery of life

Khayyam has fundamental philosophical questions about the meaning of life, why we are born, and why we must die.

Here is Fitzgerald's translation of one of his Robaiys in this context:

*There was a Door to which I found no Key:
There was a Veil past which I could not see:
Some little Talk awhile of ME and THEE
There seemed - and then no more of THEE and ME.*

Literal translation:

*The secrets eternal neither you know nor I
And answers to the riddle neither you know nor I
Behind the veil there is much talk about us, why
When the veil falls, neither you remain nor I.*

The inevitability of death

Khayyam is not afraid of death, but laments about the shortness of life.

Here is Fitzgerald's translation of one of his Robaiys in this context:

*Alas, that Spring should vanish with the Rose!
That Youth's sweet-scented Manuscript should close!
The Nightingale that in the Branches sang,
Ah, whence, and whither flown again, who knows!*

Literal translation:

*Alas the youthful fire is a dying ember
The spring of life has reached December
What is termed youth, I vaguely remember
But know not whence and how from life's chamber.*

Seize the moment; no return after death

Khayyam reminds one to enjoy life while it lasts; don't wait for Paradise; once you're gone there's no return.

Here is one of his Robaiys in this context:

گویند کسان بهشت با حور خوشست
من میگویم که آب انگور خوشست
این نقد بگیر و دست از آن نسیه بدار
کآواز دهل شنیدن از دور خوشست

Literal translation:

*Heaven is incomplete without a heavenly romance
Let a glass of wine be my present circumstance
Take what is here now, let go of a promised chance
A drumbeat is best heard from a distance.*

Fitzgerald's translation:

*"How sweet is mortal Sovranty!"--think some:
Others--"How blest the Paradise to come!"
Ah, take the Cash in hand and waive the Rest;
Oh, the brave Music of a distant Drum!*

Drinking wine

One of the most well-known Khayyam's Robaiys in the West is the following Fitzgerald's translation:

*A Book of verses underneath the bough,
A jug of wine, a loaf of bread - and thou;
Beside me singing in the wilderness,
Oh, wilderness were Paradise enow.*

سدّ رمقی باشد و نصف نانی
بیشیست که نیست در خور سلطانی

تنگی می لعل خواهم و دیوانی
وانگه من و تو نشسته در ویرانی

Another one (Fitzgerald's translation):

*You know, my Friends, how long since in my
House
For a new Marriage I did make Carouse:
Divorced old barren Reason from my Bed,
And took the Daughter of the Vine to
Spouse.*

Literal translation:

*Tonight I shall embrace a gallon cup
With at least two cups of wine I'll sup
I'll divorce my mind and religion stop
With daughter of vine, all night I'll
stay up.*

Nothing is pre-ordained

Khayyam does not believe in "pre-ordained" matters.

Here is Fitzgerald's translation of one of his Robaiys in this context:

*And that inverted Bowl we call The Sky,
Whereunder crawling coop't we live and die,
Lift not thy hands to IT for help--for It
Rolls impotently on as Thou or I.*

Literal translation:

*Good and evil, our moral prison,
Joy and sorrow passing like season,
Fate in the way of logic and reason
Is the victim of far worse treason.*

Khayyam's Scientific Works

His scientific works were known in the East for several hundred years before being discovered by Europeans.

❖ He had seminal contributions in Astrology and Mathematics.

❖ Astrology:

Nezam-ol-molk invited some scientists of the time to reform the lunar-based calendar. Khayyam was the leader of this group, whose contributions include:

- Creation of the Jalali calendar. They calculated the length of the year with amazing accuracy as 365.24219 days.
- Publishing a series of astronomical tables known as *Zij Malekshahi*.

Khayyam and Mathematics

Khayyam's book on algebra, entitled "*Jabr-va-moghabeleh*," was first translated into French and published in 1851.

Here is a summary of his Contributions:

❖ *Cubic Equations*

- The first relatively complete solution of the third-degree algebraic equation has been attributed to Khayyam. In an ingenious way, he first transformed the cubic equation into an apparently more complex fourth-degree equation. He then devised a geometric method for reducing this problem into a search for the intersection of a circle and a hyperbola.
- He provided solutions for equations of second and third degrees with positive coefficients and positive roots. He also noted that a geometric solution for a cubic equation cannot be obtained with compass and ruler. This supposition was presented more than 500 years later by the French mathematician-philosopher R. Descartes in 1637 and was proved by P. Wantzel in 1937.

❖ *The Theory of Parallels and non-Euclidean Geometries*

- In his *Theory of Parallels* he examined the postulates and axioms of Euclidean Geometry and formulated eight propositions which should be added to it. This work was instrumental in leading European mathematicians to the discovery of non-Euclidean geometries of the 19th century.

❖ *Binomials*

- Khayyam appears to be the first mathematician to deal with the calculation of the coefficients of $(x + y)^n$ for positive integer n . He calculated these coefficients for $n = 1$ to 12 . The complete factorial representation of these coefficients for any n appeared some five centuries later in the works of Pascal and Newton.

Khayyam's Popularity

- ❖ With the publication of Fitzgerald's translation of Khayyam's Robaiyat, Khayyam's popularity rose in the west.
- ❖ At least three silent movies were made about Khayyam in the 1920s:
 - "Omar the Tent Maker" (1922)
 - "Omar Khayyam" (1924)
 - "A Lover's Oath" (1922; released 1925)
- ❖ In 1931, a successful radio series of about thirteen episodes called "*Omar - Wizard of Persia*" was broadcast on the US national Radio.
- ❖ A number of artists have included Robaiyat in their music, such as in
 - British Composer Hubert Bath's "*Omar Khayyam: Four Eastern Impressions for Piano*"
 - Alan Hovanes's "The Robaiyat," narrated by Michael York (1995)
- ❖ Khayyam's poetry is quoted in many movies, e.g., "*Unfaithful*" (2002), "*The Life, Loves and Adventures of Omar Khayyam*" (1957), "*Pandora And The Flying Dutchman*" (1951), "*Duel in the Sun*" (1946), "*The adventures of Marco Polo*" (1938), "*The Life of Emile Zola*" (1937), and "*The Life of Louis Pasteur*" (1936).
- ❖ The first International Congress on Khayyam was held in Spain on May 16, 2006.

Khayyam On-Line

- ❖ Khayyam is cited on many websites dedicated to poetry and science.
- ❖ An Internet search on Khayyam results in more than a million items. Here are a few:
 - Khayyam and other Persian mathematicians:
<http://www-groups.dcs.st-and.ac.uk/%7Ehistory/Countries/Iran.html>
 - The 1995 best selling novel "Samarkand" by Amin Maalouf (French-Lebanese)
 - The Wine of Nishapur: A Photographer's Promenade in the Robaiyat of Omar Khayyam <http://www.amazon.com/Wine-Nishapur-Photographers-Promenade-Robaiyat/dp/2876580403>
 - Khayyam's Robaiyat in Persian with Fitzgerald's translation:
www.iranchamber.com/literature/khayyam/Robaiyat_khayyam1.php
 - Khayyam's Robaiyat in Persian calligraphy:
www.iranian.com/Arts/Khayyam/2.html
 - Khayyam's Robaiyat with Fitzgerald's translation, as well as and other Persian poets: www.blissbat.net/rambles/persian.html
 - Robaiyat in Italian:
http://www.superzeko.net/doc_dariochioli_saggistica/DarioChioliOmarKhayyam.html
 - Robaiyat of Omar Khayyam in Persian calligraphy with literal, English, and German translations: <http://www.okonlife.com/poems/>