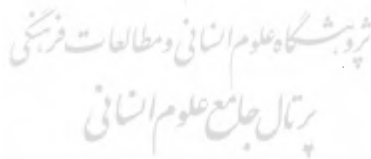


Furthermore, the free translations of Fitzgerald created a Western image of Khayyām one of whose strong components was pleasure seeking and immediate gratification of the senses. In today's Western world where much more than the Victorian period instant sensual gratification has become practically a pseudo-religion, it is even more difficult than at the time of Fitzgerald to absolve Khayyām of the guilt of being a hedonist. Yet, there is no authenticated poem of Khayyām dealing with the after-life which cannot be interpreted as belonging to the third rather than the first view stated above. And when this celebration of the present moment and taking advantage of life while we have it is taken into consideration in conjunction with everything he has written and also what his contemporaries wrote about him and even the honorific titles bestowed upon him,³⁹ it becomes more evident that far from being a hedonist, Khayyām sought to point out the preciousness of human life and the reality of the present moment as the door to the Eternal Realm in a manner consonant with the teachings of the great Sufi masters. Very fame on the mundane plane as caused his philosophical importance to become veiled from the world at large.



(39 Some of these titles include *al-imām* (the leader), *hakīm al-dunyā* (the philosopher of the world), *hujjat al-ḥaqq* (Proof of the Truth) *al-sahykh al-ajall* (the exalted master), *faylasūf al-waqt* (the philosopher of the time), etc. pp. 32-33.

the case of modern agnostics who have deliberately

IV. In conclusion, one can assert with assurance that if one studies all of the works of Khayyām including the more authenticated *rubā'īyyāt*, one is able to discern the philosophical worldview of a major Islamic thinker who in philosophy was mostly a follower of Ibn Sīnā with certain independent interpretations of his own. He was also a major scientist with important views concerning the philosophy of mathematics. In addition he was a poet, who like many other Islamic philosophers and scientists who wrote works with rigorous logical structures, wrote poems on the side with metaphysical and gnostic themes. He was also without doubt personally attracted to Sufism. If we were asked to compare him to another Islamic figure who would most resemble him, we would choose Naṣīr al-Dīn Ṭūsī who was, like Khayyām, an Avicennian (*mashshā'ī*) philosopher and a mathematician, who also wrote some poetry and was interested in Sufism in which he also wrote a treatise *Sayr wa sulūk* ("Spiritual Wayfaring")³⁸. Of course Ṭūsī was also a Twelver Imam Shī'ite theologian and authority on Ismā'īlī philosophy in contrast to Khayyām who was not concerned with these subjects to any appreciable extent.

Khayyām must be resuscitated as an Islamic philosopher even if such an act will take a cultural hero away from modern Arab, Turkish and especially Persian skeptics and hedonists. His philosophical works need to be translated and studied in their totality. The present study, however, be sufficient to reveal the great significance, philosophical, scientific and also religious, of a remarkable Islamic philosopher, whose associated the two opposite views together in order to attack those who hold on to the second view. The limited understanding of ordinary believers is the reason why not only Khayyām but a number of other figures, mostly Sufis, have been condemned by some traditional exoteric authorities over the ages. In the case of other Sufi figures, however, their distinction from hedonists has remained clear enough despite their having received condemnation from some quarters. In the case of Khayyām, a number of factors among them the intrusion of poems not by him into the corpus of the quatrains attributed to him, caused a number of traditional authorities, including even a few Sufis, to condemn him even before modern times despite the fact that he certainly did not lead a hedonistic life but was deeply revered as an Islamic scholar by his contemporaries.

³⁸ This work has been translated as *Contemplation and Action*, trans. S. J. Badakhchani, London, I. B. Tauris, 1999.

there is an allusion of the relativity of even Being *vis-à-vis* the Beyond Being which alone is real in the ultimate sense.³⁶ The deepest message of such quatrains is that all that is relative is by nature relative and therefore transient only the Absolute possessing absoluteness as such, or more simply put, only the Absolute is absolute.

These few quatrains chosen among those attributed with more certainty to Khayyām provide a sampling of ideas which, if understood in the context of traditional Islamic philosophy and Sufism, do not only not negate but confirm in poetical language Khayyām's prose philosophical and scientific works in addition to revealing certain Sufi themes of which Khayyām must have had intimate knowledge. His classification of knowers cited above reveals his reverence for and understanding of the Sufi path of knowledge. The major themes of the more authenticated quatrains is the transience of the world, the limited nature of all rational knowledge before that veritable *sophia* which transcends ratiocination and taking advantage of the present moment and experiencing the effect of that wine which symbolizes realized knowledge or gnosis. None of these themes is contradictory to his prose works. On the contrary, the prose and poetry complement each other and together reveal a fuller picture of Khayyām as metaphysician and philosopher.

It might be said that there are three types of human beings: those who deny all eschatological realities and the Day of Judgement to which Persian Sufis refer as "Tomorrow" (*farda*)³⁷; those who believe in the traditional eschatological realities and seek to live a virtuous life in this world in fear of hell and hope of paradise; and those who seek God here and now beyond fear of hell and hope of paradise. Since extremes meet, the views of the first and third group might appear to some people who look at the matter superficially to be the same in that both emphasize the here and now at the expense of man's final end in that "tomorrow" which is beyond time. The first view, however, is the denial of religion from below and the third view which is esoteric, is the transcendence of the exoteric view from above. For the exoteric pious believers it is sometimes difficult to make a distinction between the two. That is why they have often condemned not only the first view but also the third, their condemnation being in fact justified on its own level which is not

(36 On this issue see S. H. Nasr, *Knowledge and the Sacred*, Albany (NY), State University of New York Press, 1989, chapter four, pp. 130 ff.

(37 The 13th/19th century Persian philosopher and saint Ḥājj Mullā Ḥādī Sabziwārī in fact refers to eschatology as "the science of Tomorrow" or *fardā-shināsī*.

44 *Farhang, Commemoration of Khayyām*

fest and then non-manifest, to enter into phenomenal existence and then *disappear* from that realm or become literally “devoid of appearance” or *napaydā* which also means not to be found. Can one not understand this verse as meaning that we, even if compared to a lowly fly in this vast world of change, come from the unmanifested and the invisible into the world of manifestation and phenomenal existence and then return to that unmanifested and invisible world?

In a quatrain with profound eschatological significance a Khayyāmian quatrain asserts,

If the heart knew the secret of life as it is,
It would also know the Divine Mysteries at death.
Today when with thy *self*, thou knowest nothing,

Many have construed this and similar quatrains in a modern nihilistic manner as if Khayyām were an existential nihilist *à la* certain schools of twentieth century Continental philosophy. But this interpretation is totally false if one considers the fact that Khayyām never denied the reality of God, the Absolute. Besides referring to the metaphysical understanding of nothing or void which is none other than the Quintessential Naught or Beyond Being to which Khayyām alludes in several verses,³⁵ this poem can be seen as a clear statement of the relativity of the human state and that from the point of this relativity, if taken only in itself, man and indeed the world are literally nothing in the face of the Absolute. In Avicennan language, which Khayyām confirms in his prose philosophical works, man, like all beings in this world, is “contingent” (*mumkin*) and receives his reality from the source of Being through that process of *fayadān* discussed above. This and similar quatrains can be read with perfect logic as poetical assertions of the status of contingency, which is complete poverty of existence or nothingness of the world, in contrast to the Necessary Being (*wājib al-wujūd*) which alone possesses and bestows *wujūd* upon all that exists. And all that exists by virtue of existentiatio by the Necessary Being. In addition, in these poems

(35 “Being Itself, which is none other than the Personal God, is in its turn surpassed by the Impersonal or Supra-Personal Divinity, Non-Being, of which the Personal God or Being is simply the first determination from which flow all the secondary determinations that make up cosmic Existence. Exoterism cannot, however, admit either this unreality of the world or the exclusive reality of the Divine Principle, or above all, the transcendence of Non-Being relative to Being...” F. Schuon, *The Transcendent Unity of Religions*, trans. P. Townsend, London, The Theosophical Publishing House, 1993, p. 38.

the modern debased sense of imagination which implies simply irreality. Rather, by calling the cosmos an imaginal lamp, he not only alludes to the cosmic significance of *'ālam al-khayāl*, but also indicates for the philosophically unsophisticated reader the fact that the cosmos is not ultimate reality but that there is a reality beyond it which reflects as a Tomorrow when stripped of *self*, what wilt thou know?³³

This quatrain speaks in poetic language of one of the most important doctrines of Islamic eschatology which has been fully developed by later Islamic metaphysicians and philosophers such as Ibn 'Arabī and Mullā Ṣadrā. According to this doctrine, the soul while in this world can both act and know. At the moment of death, it is cut off from both acting on the world and knowing it and will take with it only the fruits of its action and the knowledge which it has gained of spiritual matters while on this earthly journey. These are its "provisions" for the journey of the after-life which Mullā Ṣadrā discusses in these very terms in one of his works entitled *Zād al-musāfir* ("Provisions of the Traveler"). This quatrain is nothing but a simple poetic description of a major Islamic eschatological teaching.

Finally, it is necessary to mention at least one quatrain that speaks of man's nothingness in face of the Absolute.

O Thou, unversed in ways of the world, thou art naught;
The bedrock is based on air, hence thou art naught.
Two voids define the limits of thy life.
On thy two sides nothing, in the middle thou art naught.³⁴

lamp is the locus wherein light shines upon a scene. And then he points to our transient earthly existence which is constituted of images and forms caused by the light of a lamp on the shade around it. The second quatrain confirms the same thesis from another point of view starting with the assertion that all things in this world return to their source and principle according to the famous philosophical dictum *kullu shay'in yarji'ū ilā aṣlihi*, "all things return to their source of root." And in this great coming and going which marks the life of this transient world, our earthly existence is like that of a fly which appears and then disappears in a fleeting moment. It is metaphysically very significant that in this quatrain Khayyām uses the Persian words *padīd* and *nāpaydā* and not life and death. These two Persian terms mean to become mani-

(33 Highly modified translation of Saidi, *op. cit.*, no. 65, p. 122.

(34 Modified translation of Saidi, *op. cit.*, No. 70, p. 127.

tude derived from gnosis that is symbolized by wine as again found universally in Sufi poetry. In fact, many leading Islamic thinkers, philosophers and scientists alike not to speak of Sufis, have composed poems in this vein. In our own times the poems of even such religio-political figures and Mawlānā Mawdūdī and Ayatollah Khumaynī contain many verses in the same vein. The holding of the goblet of wine and drinking it here and now, a theme repeated in several other quatrain of Khayyām, also refers to the preciousness of the present moment which is our only access to the Eternal and the gaining of absolute certitude. One must not forget in this context the Sufi addage *al-ṣūfī ibn al-waqt*, that is, the Sufi is the son of the moment.

Many Khayyāmian quatrains also refer to the transience of the world and our rapid journey through it.

The rotating wheel of heaven within which we wonder,
Is an imaginal lamp of which we have knowledge by similitude.
The sun is the candle and the world the lamp,
We are like forms revolving within it.³⁰

Also,

A drop of water falls in on ocean wide,
A grain of dust becomes with earth allied;
What doth thy coming, going here denote?
A fly appeared a while, then invisible he became.³¹

In the first quatrain the cosmos is likened not only to just any lamp, but to an imaginal lamp indication the significance of the "world of imagination" (*'ālam al-khayāl*) with all the metaphysical and cosmological significance that it possesses in Islamic thought as we see expounded later in the works of Suhrawardī, Ibn 'Arabī, Mullā Ṣadrā and others.³² There is no reason to believe that here Khayyām is using *khayāl* in

Of secrets, scarcely any, high or low,
All day and night for three scores and twelve years,
I pondered just to learn that naught I know.

Saidi, *op. cit.*, n. 68, p. 125.

(30) The translation is our own highly modified version of Saidi, *op. cit.*, no. 63, p. 120.

(31) Modified translation of Saidi, *op. cit.*, no. 64, p. 121.

(32) See H. Corbin, *Creative Imagination in the Sufism of Ibn 'Arabī*, trans. R. Manheim, Princeton, Princeton University Press, 1969; and E. Zolla, *The Uses of Imagination and the Decline of the West*, Ipswich, Golgonooza Press, 1978.

philosophers, governs all human existence and that God has knowledge of all things. It is a poetic commentary upon the meaning of the two Divine Names *al-Qādir*, the Omnipotent, and *al-‘Alīm*, the All-Knower or Omniscient.

A quatrain, which appears outwardly more problematic, sings of the relativity of human knowledge as follows:

With neither truth nor certitude in scope,
 Why waste our lives in doubt or futile hope?
 Come, never let the goblet out of hand,
 In fog, what if you drunk of sober grope?²⁸

This quatrain might seem to be preaching out and out skepticism if taken literally. But would a person who accepted such a philosophy spend so much time and effort writing a work on algebra or reform the calendar? If seen in the context of the Islamic intellectual tradition, the content of these verses reveals its inner meaning to be something else which is the relativity of all human or rational knowledge²⁹ and the certi-

(28 Saidi, *op. cit.*, no. 60, p. 117. Such verses must be read in conjunction with those which affirm in no uncertain terms Khayyām's certitude concerning the knowledge of God and that He is ultimately the only Reality. For example,

He is, and naught but Him exists, I know,
 This truth is what creation's book will show,
 When heart acquired perception with His Light,
 Atheistic darkness changed to faithfully glow.

Swāmī Govinda Tirtha, *The Nectar of Grace*, p. 1.

Khayyām also speaks of the divine grace which makes such a knowledge possible. In one of his rare Arabic poems, noted by Shams al-Dīn Shahrāzūrī in his *Nuzhat al-arwāḥ*, Khayyām sings,

I soar aboth both Worlds to Highest Relam
 With lofty courage and with sober thoughts.
 The Guiding Light of Wisdom dawns in me
 In the Darkness, and Delusion os dispelled.
 The foe may try to extinguish the Light,
 But God maintains it by his Grace Divine.

Swāmī Govinda Tirtha, *op. cit.*, CXXXI, with some modification.

(29 This theme of the relativity of all human knowledge when measured with the yardstick of Divine Knowledge is a recurrent theme in many of these quatrains, for example,

Of science naught remainde I did not know,

sophical treatises together, one sees Khayyām as essentially an Avicennan philosopher with particular acumen in mathematics and interest in mathematical and natural order on the one hand and in Sufism on the other. There are also philosophical insights which are Khayyām's own and he is far from being simply a repeater of Ibn Sīnā's words. Furthermore, as in the case of the master whom he calls *the* philosopher, Khayyām's whole philosophical discourse is based on the Necessary Being, the One, who is the Reality which in religious language is called God. Khayyām goes in fact a step further than many *mashshā'ī* philosophers in using religious references in his philosophical treatises including Quranic verses to which we have already referred.

III. Let us in conclusion turn to some of the quatrains more strongly attributed to Khayyām and consider their philosophical significance. One of the most famous quatrains states,

Thou hast said taht Thou wilt torment me,
 But I shall fear not such a warning.
 For where Thou art, there can be no torment,
 And where Thou art not, how can such a place exist?²⁶

This quatrain confirms the utter goodness of God, the fact that the Supreme Reality is Pure Goodness, an idea also confirmed in Khayyām's prose philosophical works. This quatrain re-confirms in a novel language an assertion to be found in many Sufi utterances in prose and poetry and also indicates the ultimate victory of good over all that appears as evil. In a sense it is a commentary upon the sacred saying of the Prophet (*ḥadīth qudsī*), "Verily My Mercy precedeth My Wrath".

Another quatrain states,

Thrown in before Fate's Mallet, O man Thou goest,
 Struck by blows to left and right, remain silent.
 He who hast flung thee with this mad course,
 He knoweth, he knoweth, he knoweth and knoweth.²⁷

The message in this poem is that *qaḍā'*, translated here as Fate but which must be understood as a decree by the Divine Will and not some kind of natural and cosmic fate in the manner of certain Greek

(26 The translation is our own.

(27 Modified translation of the *Ruba'iyat of Omar Khayyam*, translated and annotated by Ahmad Saidi, Berkeley (CA), Asian Humanities Press, 1991, no. 59, p. 116.

nation. Divine Knowledge is the same as the presence of God in all beings even that which possesses only mental existence. Furthermore, since God is the source of reality of all quiddities and essences, all that is thus existentiated is good and what appears otherwise as non-existence and hence evil is the result of the necessity of contradiction (*darūrat al-taḍādd*).

Finally among the specifically philosophical treatises of Khayyām there is one that is almost certainly by him, although not noted in the list given by some of the scholars of the subject, and that is a series of responses entitled *Risālah jawāban li-thalāth masā'il*²⁵ ("Treatise of Response to Three Questions"). In one manuscript the person posing the questions is Jamāl al-Dīn 'Abd al-Jabbār ibn Muḥammad al-Mishkawī, while in another manuscript he is referred to as Amīn al-Ḥaḍrah and at the end of the treatise as al-Shaykh Jamāl al-Zamān. Although the identity of this person is not clear, it seems that he was a philosopher from Fars. In any case the questions, which are as follows, display the philosophical interests and preoccupations of the questioner:

1. If the rational soul survives after death, it would be necessary for each rational soul to have a specific personal existence.
2. If happenings in the domain of contingent beings have a single cause, this will lead to an infinite regression.
3. It has been proven that time depends on movement and is the quantity of movement of the spheres and that movement is not steadfast by itself... [Khayyām does not complete the question].

All of Khayyām's responses are based on Ibn Sīnā views to whom he refers as *al-faylasūf*, the philosopher, More specifically he refers to the *Fann al-samā' al-ṭabī'ī*, the first book of *Ṭabī'īyyāt* (Natural Philosophy) of the *Shifā'* as well as to the works of Aristotle as sources for response to these questions. Khayyām makes an important philosophical assertion by saying that the *Fann al-samā' al-ṭabī'ī* (which means literally "the art of natural hearing" or that which one should hear first in the study of the natural sciences) contains the principles of all the natural sciences but is itself a branch of universal knowledge. In other words the principles of the sciences are to be sought not in themselves but in metaphysics.

There are a few other short philosophical fragments of Khayyām which deal more or less with the same issues that one finds in the treatises mentioned already. When one examines all of these philo-

(25 Naji Isfahanī, «Khayyām's treatise of Response to Three Questions», *Farhang, op. cit.*, pp.

of all things" (LXXII; 28). The first asserts that the being of all things issues from God and the second that there is an order to all things. And it is precisely these two issues that comprise the basic elements of this treatise.

Khayyām emphasizes that quiddities receive their existence from another existence (*al-wujūd al-ghayrī*) and calls this process emanation (*fayadān*). But at the same time Khayyām asserts that for each existent, it is the quiddity that is principial while *wujūd* is a conceptual (*i'tibārī*) quality. Although the distinction between the principiality of *wujūd* (*aṣālat al-wujūd*) and the principiality of *māhiyyah* (*aṣālat al-māhiyyah*) goes back to the School of Isfahan and especially Mullā Ṣadrā,²⁴ later students of Islamic philosophy have tended to look upon the whole earlier tradition from this point of view and sought to determine who belonged to which school. If we apply this later distinction with its own particular terminology to Khayyām, then we could say that Khayyām, like Suhrawardī, Naṣīr al-Dīn Ṭūsī, Ghiyāth al-Dīn Maṣnūr Dashtakī and Mīr Dāmād belongs to the school of principiality of quiddity, although he does not use the term *aṣālat al-māhiyyah* as was done by Mullā Ṣadrā and many other later philosophers.

In addition to emphasizing emanation and its continuous nature, following the views of both Ibn Sīnā and Suhrawardī, Khayyām also insists that this emanation is based on and contains order and laws. The two verses of the Quran stated at the beginning of the treatise are for Khayyām revealed proofs of this assertion, namely, the continuity of emanation from the Divine Reality which bestows existences upon all things and the orderly nature of this emanation. Consequently, the so-called "laws of nature" and what one observes everywhere in the created realm as order and harmony issue from the very reality which bestows existence upon things and are inseparable from their ontological reality.

Khayyām is also concerned with the difficult question of God's knowledge of the world, a question which has concerned nearly all Islamic philosophers throughout the ages. He asserts that knowledge or *'ilm* is a quality of *wujūd* and therefore since God bestows *wujūd* upon all creatures, He knows all of His creation simply by virtue of having brought them into being. As for *wujūd* it is itself an attribute of the Divine Reality (*al-Ḥaqq*) and identical to Its Essence. Divine Knowledge, while being none other than the Divine Essence, is also none other than ema-

(24 See S. H. Nasr, *Ṣadr al-Dīn Shīrāzī and His Transcendent Theosophy*, Tehran, Institute for Humanities and Cultural Studies, 1997, pp. 109 ff.

before it. Therefore, they say that it is better to seek knowledge from the words of a truthful person.

“Fourth, the Sufis, who do not seek knowledge by ratiocination or discursive thinking, but by purgation of their inner being and the purifying of their dispositions. They cleanse the rational soul of the impurities of nature and bodily form, until it becomes pure substance. When it then comes face to face with the spiritual word, the forms of that world become truly reflected in it, without any doubt or ambiguity.

“This is the best of all ways, because it is known to the servant of God that there is no reflection better than the Divine Presence and in that state there are no obstacles or veils in between. Whatever man lacks is due to the impurity of his nature. If the veil be lifted and the screen and obstacle removed, the truth of things as they are will become manifest and known. And the Master of creatures [the Prophet Muḥammad] – upon whom be peace – indicated this when he said: ‘Truly, during the days of your existence inspirations come from God. Do you not want to follow them?’

“Tell unto reasoners that, for the lovers of God [gnostics], intuition is guide, not discursive thought.”²²

What is astonishing in this classification is Khayyām’s defense of the Sufis and knowledge attained through inner purification, which they call *kashf*, as the most perfect and highest form of knowledge. One cannot make any judgement about Khayyām without paying full attention to this classification. Since this work is without doubt authentic and Khayyām was not a kind of thinker to write a *piece d’occasion* to satisfy this or that worldly authority, this assertion by him cannot but confirm his devotion to Sufism and makes even more plausible a Sufi interpretation of the authentic verses of Khayyām.

Perhaps the most important single philosophical opus of Khayyām is his Arabic text *al-Risālah fi’l-wujūd* (“Treatise on Being”) also known as *al-Risālah fi taḥqīqāt al-ṣifāt* (“Treatise concerning Verifications of the Qualities”).²³ It begins with two Quranic verses which contain the essence of the content of the treatise: “He gave unto everything its creation, then guided it right” (XX; 50), and “He counteth the number

(22 *Op. cit.*, pp. 389-90. See Nasr, *Science and Civilization in Islam*, Chicago, ABC International, 2001, pp. 33-34. See also pp. 52-53 of the same work; also F. Schuon, *Spiritual Perspectives and Human Facts*, trans. P. Townsend, Pates Manor, Perennial Books, 1987, pp. 76-77.

(23 See Swāmī Govinda Tirtha, *The Nectar of Grace*, pp. CX-CXVI.

existence. Khayyām criticizes severely what he considers as a sophism concerning this question. He asserts that *wujūd* and *baqā'* have a single meaning and should not be separated from each other.

In the short Arabic work, *Risālat al-diyā' al-'aqlī fi mawḍū' al-'ilm al-kullī* ("Treatise of Intellectual Light concerning Universal Science")²⁰ Khayyām discusses the relation between existence and quiddity following the views of Ibn Sīnā to whom he refers indirectly. Khayyām makes a clear distinction between quiddity in itself and *wujūd* which is distinct from *māhiyyah* and is added to it in order to existentiare a quiddity objectively.

One of the important philosophical works of Khayyām is the Persian treatise *Risālah dar 'ilm-i kullīyyāt-i wujūd* ("Treatise on the Science of the Universal Principles of Being") also known as *al-Risālah fi 'ilm al-kullīyyāt* ("Treatise on Universal Principles") and *al-Risālah mawsūmah bi-silsilat al-tartīb* ("Treatise Known as The Hierachic Chain").²¹ In this treatise Khayyām discusses the chain of being and the ten intelligences following the views of Ibn Sīnā. It is also in this treatise that Khayyām discusses his classification of those who seek knowledge. Because of the singular significance of this classification for the understanding of Khayyām's philosophical perspective we quote this section in full:

"First, the theologians, who become content with disputation and 'satisfying' proofs, and consider this much knowledge of the Creator (excellent is His Name) as sufficient.

Second, the philosophers and sages who use only rational arguments to know the laws of logic, and are never content merely with 'satisfying' arguments. But they too cannot remain faithful to the conditions of logic and become helpless with it.

"Third, the Ismā'īlīs who say the way of knowledge is not verifiable except through receiving instructions from a truthful instructor; for, in bringnig proofs about the knowledge of the Creator, His Essence and Attributes, there is much difficulty; the reasoning power of the opponents and the intelligence [of those who struggle against the fianl authority of the revelation, and of those who fully accept it] is stupefied and helpless

[20 See Jamshid Nezhadeh Avval. «Khayyām's treatise on Intellectual fight concerning Universal Science», in this issue of *Farhang*.

[21 See A. Christensen, "Un trité de métaphysique de 'Omar Khayyām", *Le Monde Oriental*, vol. 1, no. 1, 1906, pp. 1-16. The Persian text and an English translation of it is to be found in Swāmī Govinda Tirtha, *op. cit.*, pp. XLVII-XLVIII and CXVII-CXXIX.

put within the very substance of man through the act of his creation. Being what he is, man is in need of others and therefore bears responsibility towards them. Khayyām also speaks of the necessity of prophecy. The prophets are the most perfect of all men and can therefore propagate and promulgate divine laws among men in justice. As far as differences among men in virtue and evil character are concerned, Khayyām relates them on the one hand to the difference of temperaments, themselves based on bodily fluids and the elements mentioned in traditional Islamic medicine, and on the other to the different make ups of their souls. According to Khayyām prophets reveal rites of worship so that God will not be forgotten and so that the teachings of God's laws will remain in human society. He then explains more fully the benefits of rites of worship for both the individual human soul and society as a whole. One can hardly imagine a greater difference between the Khayyām who is the author of this treatise and the modern version to him based on free translations of often spurious quatrains interpreted in such a way as to support the skeptical attitudes of certain modern readers of Khayyām in both East and West.

In his Arabic treatise *Ḍarūrat al-taḍādd fi'l-'ālam wa'l-jabr wa'l-baqā'* ("The Necessity of Contradiction in the World and Determinism and Subsistence"), which Sayyid Sulaymān Nadwī¹⁹ considers as a continuation of *Risālah fi'l-kawn wa'l-taklīf*, Khayyām responds to three further questions which some like Nadwī consider to be answers to questions also posed to him by Nasawī. The first question concerns theodicy, that is, how can evil issue from the Necessary Being who being pure goodness cannot be the author of evil and oppression. After analyzing different kinds of attribution, Khayyām states that although it is absolutely true that the Necessary Being alone bestows existence upon things, the very bestowal of existence implies contradiction which is non-existence and it is non-existence which appears to us as evil and privation. That is why evil cannot be compared either in quantity or quality with the good.

The second question asks which of the two schools, that of determinism or free will is correct. In a short answer Khayyām leans in favor of determinism, adding that this position is correct provided its followers do not exaggerate and fall into superstition.

The third question involves the quality of subsistence in relation to

(19 See S.S. Nadwī, *Khayyām Awr us ke savānīḥ va tasānīf*. For the text of the treatise see Swāmī Govinda Tirtha, *op. cit.*, pp. XCIX-CX for both the Arabic text and an English translation by M. W. Rahman.

to be a direct student of Ibn Sīnā, but this assertion cannot be taken as being literally true because of the dates of the birth and death of the two figures involved. Rather, it means that Khayyām was a student of the school of Ibn Sīnā and his philosophical lineage in fact goes back through Lūkarī and Bahmanyār to Ibn Sīnā himself. This direct intellectual descent is of great importance in the case of Khayyām in situating him in the matrix of the general Islamic intellectual tradition. Moreover, such intellectual lineage is very pertinent for Islamic philosophical figures in general.

The Arabic treatise *al-Risālah fi'l-kawn wa'l-taklīf* ("Treatise on the Realm of Existence and Human Responsibility") is one of Khayyām's substantial philosophical writings in which he mentions Ibn Sīnā explicitly as his master.¹⁶ Much of the first part of this work in fact follows Ibn Sīnā closely and furthermore some of its phrases are almost identical to those of Ibn Sīnā's *al-Ishārāt wa'l-tanbīhāt* ("The Book of Directives and Remarks"). The treatise consists of answers provided by Khayyām to a number of questions sent to him by Abū Naṣr Nasawī, the judge (*qāḍī*) of the province of Fars concerning the creation of the world and man's responsibility toward his Creator.¹⁷ Khayyām, who in all of his works was to the point and disliked unnecessary verbiage, begins by stating that the subject of philosophy is essentially the response to three questions: Whether something is, what it is and why it is what it is. The answer to the first question leads in the discussion of being (*wujūd*), the second quiddity (*māhiyyah*) and the third causality (*'illiyyah*). Then he directs his attention to ontology following closely Ibn Sīnā in discussing the descending and ascending arcs of existence and the hierarchic chain of being.¹⁸

Khayyām then turns to the question of responsibility towards both God and His creatures, responsibility which according to him, has been

(16 See Swāmī Govind Tirtha, *op. cit.*, pp. XLVI and LXXXIII-XCIX which contain both the Arabic text of this treatise and an English translation by Abdul Quddūs.

(17 The fact that an eminent religious authority far away from Khurasan should write to Khayyām on such matters, is itself proof of Khayyām's status as an Islamic thinker in the eyes of his contemporaries. Such a request would be unconceivable if Khayyām had been seen at that time as the skeptical and hedonist figure that many modern people envisage him to be.

(18 For the summary of Ibn Sīnā's on these matters see S. H. Nasr, *An Introduction to Islamic Cosmological Doctrines*, Albany (NY), State University of New York Press, 1993, pp. 197 ff.

domain of reality. Wolfgang Smith in his brilliant work, *The Quantum Enigma*, calls the first, that is electrons, etc., physical and the second, that is ordinary objects such as apples, corporeal. The first is potential and the second actual with the modification that needs to be made in such Aristotelian terms when dealing with modern physics.¹³ The distinction made by Khayyām and others between the two types of body in question is in many ways related to the issue brought up by Wolfgang Smith and is of great significance for the philosophy of mathematics and the relation between mathematics and physics envisaged from a philosophical point of view.

II. In turning to Khayyām's properly speaking philosophical works, it is necessary to deal with each work separately since our concern in this essay is after all with his philosophy.¹⁴ Let us first turn to Khayyām's translation with brief commentary of Ibn Sīnā's *-Khuṭbat al-gharrā'* ("The Splendid Sermon") dealing with the praise of God.¹⁵ This beautifully composed treatise on Divine Unity is somewhat reminiscent of the poems of such figures as Abū Bakr Muḥammad ibn 'Alī Khusrawī. Also after Khayyām, the famous poet laureate Fakhr al-Dīn As'ad Gurgānī in his *Wīs wa Rāmīn* ("The Romance of Wīs and Rāmīn") composed lines similar to Ibn Sīnā's. The significance of this treatise is first of all in Khayyām's strong attestation to the reality of God and His Unity. In fact the content of the treatise, which he chose to translate and elucidate rather than criticize, meaning that he accepted and identified with its content rather than opposing it, stands diametrically opposed to the religious skepticism and agnosticism that some have read into Khayyām's philosophy basing themselves solely on some of the poems attributed to him. Secondly in light of the fact that Khayyām rarely praised or repeated predecessors, the very fact that he chose to translate a work of Ibn Sīnā proves the extent of his respect for Shaykh al-ra'īs and only confirms the assertion of all the traditional sources that in philosophy Khayyām was a follower of him. Some in fact have considered Khayyām

(13 See W. Smith, *The Quantum Enigma*, Peru (III.), Sherwood Snyder, 2000; see also S. H. Nasr, "Perennial Ontology and Quantum Mechanics", *Sophia*, vol. 3, no. 1, Summer 1997, pp. 135-159.

(14 See Swāmī Govinda Tirtha, *The Nectar of Grace*, Allahabad, Ketabistan Press, 1941; M.M.L. 'Abbāsī, *Kulliyāt-i āthār-i pārsī-yi 'Umar Khayyām*, Tehran, 1338 (A. H. solar); S.S. Nadwī (ed.), *Khayyām-Awr us ke savānih va taṣānif*, A'zamgarh, Dār al-Musanifin.

(15 For the English translation of this text see K.A.M. Akhtar, "A tract of Avicenna," *Islamic Culture*, vol. 9, 1935, pp. 221-222.

viding his proofs, Khayyām had to have recourse to some non-Euclidean theorems.¹² Moreover, in his study of the fifth postulate Khayyām discussed concepts of space and geometric order which are of much importance for the philosophy of mathematics. This question is also dealt with in another manner in his *Algebra* where the relation between algebraic equations and geometric figures plays a central role and where Khayyām in a sense geometrizes algebra.

A third important issue worth mentioning is the clear distinction made by Khayyām, on the basis of the work of earlier Islamic philosophers such as Ibn Sīnā, between natural body (*al-jism al-ṭabīʿī*) and mathematical body (*al-jism al-taʿlīmī*). The first is defined as a body which is in the category of substance and which stands by itself while the second, also called volume (*ḥajm*), is of the category of accident which does not subsist by itself in the external world. The first is the body with which the natural sciences deal and the second is the concern of mathematics. Khayyām was very careful in respecting the boundaries of each discipline and criticized Ibn al-Haytham in his proof of the parallel postulate precisely because he had broken this rule and had brought a subject belonging to natural philosophy, that is, motion which belongs to the natural body, into the domain of geometry which deals with mathematical body.

In this distinction between *al-jism al-ṭabīʿī* and *al-jism al-taʿlīmī* by Khayyām, Tūsī and others there is a basic metaphysical principle involved that is of great significance even for the philosophy of quantum mechanics. Many people today think of atomic particles such as the electron and proton as if they were corporeal objects such as apples and pears except on a much smaller scale. In fact, however, the two classes of things belong to two different realms of existence and not to a single

metes see in addition to works cited in footnote 3, N. Kanani, "Omar Khayyām and the Parallel Postulate", in *Farhang, op. cit.*, pp. 107ff; and J. Homāʿī, *Khayyāmī-nāmah*, Tehran, Anjuman-i Millī, 1346 (A. H. solar), pp. 9ff, which contains a detailed discussion of Khayyām's views in relation to those who came before him and also in light of the principles of Islamic philosophy and logic. See also O. Bakar, "Umar Khayyām's Criticism of Euclid's Theory of Parallels", in his *The History and Philosophy of Science*, Cambridge, Islamic Texts Society, 1999, pp. 157-172.

(12 "We find here [in reference to Khayyām's proof of the parallel postulate], apparently for the first time in history, the three situations later known as the hypothesis of the acute angle (case a), that of the obtuse angle (case b) and that of the right angle (case c). These three situations are now known to lead respectively to the non-Euclidean geometry of Bolai-Lobacevskii, and to that of Riemann". D. J. Struik, "Omar Khayyām, mathematician".

probably studied more extensively as a *mashshā'ī* philosopher like many others of the 4th/10th or 7th/13th century. But he was destined to remain a solitary figure between Ibn Sīnā's students Bahmanyār ibn Marzbān and Abu'l-'Abbās Lūkarī on the one hand and Naṣīr al-Dīn Ṭūsī and other philosophers of the 7th/13th century on the other. Yet, although a lonely figure who preferred solitude and did not like to accept students, he was highly revered as both philosopher and mathematician by scholars of his own generation as well as those who came thereafter.

Although much attention has been paid during the past century both in the West and to some extent in the Islamic world itself to the history of mathematics in Islamic civilization, much less attention has been paid to the Islamic philosophy of mathematics with which many Islamic scientists such as Khayyām dealt. Needless to say, from the point of view of philosophy, the most important contribution of Khayyām's mathematical works is to the philosophy of mathematics. To illustrate this assertion; it is sufficient to draw attention to three basic mathematical ideas with which Khayyām deals and which possess a strong philosophical dimension. The first is the question of mathematical order. Where does this order issue from and why does it correspond to the order dominant in the world of nature? Khayyām was fully aware of this basic problem but answered it in one of his philosophical treatises on being to which we shall turn shortly rather than in a mathematical treatise. Khayyām's profound answer is that the Divine Origin of all existence not only emanates *wujūd* or being by virtue of which all things gain reality, but It is also the source of order which is inseparable from the very act of existence. To speak of *wujūd* is also to speak of order which the science of mathematics studies in turn as do certain other disciplines.

A second mathematico-philosophical point with which Khayyām was concerned is the significance of postulate in geometry and the necessity for the mathematician to rely upon philosophy in order to prove the postulates and principles of his own science, hence the importance of the relation of any particular science to prime philosophy. More specifically Khayyām was interested in the pertinence of the fact that the fifth postulate of Euclid, called the parallel postulate, cannot be proven on the basis of existing axioms. Khayyām refused to enter motion into the attempt to prove this postulate as had Ibn al-Haytham because Khayyām associated motion with the world of matter and wanted to keep it away from the purely intelligible and immaterial world of geometry.¹¹ In pro-

(11) On Khayyām's commentary on the *Difficulties in the Postulates of Euclid's Ele-*

only to recall the name of such important figures of Ash'arite *kalām* as Imām al-Ḥaramayn Juwaynī and Abū Ḥāmid Muḥammad Ghazzālī, both from Khurasan, to confirm this fact. Ghazzālī was not only an Ash'arite *mutakallim*, but in his opposition to *falsafah* he certainly joined the Ash'arite ranks.

During this period the teaching of philosophy was marginalized to the extent that the Seljuq prime minister, Khwājah Niẓām al-Mulk, in his conditions for the endowment of the Niẓāmiyyah *madrāsah* system, stipulates that philosophy should not be taught therein. This was the period of such works as the *Tahāful al-falāsifah* ("Incoherence of the Philosophers") of Ghazzālī, the *Muṣāri'at al-falāsifah* ("Wrestling with the Philosophers") of Abu'l-Faṭḥ Shahrastānī and the *Sharḥ al-ishārāt* ("Commentary upon the Book of Directives [and Remarks]) of Fakhr al-Dīn Rāzī, all works opposed to *falsafah*. It is usually said that between the middle of the 5th/11th century and the beginning of the 7th/13th century, *falsafah* was eclipsed in the eastern lands of Islam and flourished only in the Maghrib where Ibn Rushd was to write his response to Ghazzālī in his *Tahāfut al-tahāfut* ("Incoherence of the Incoherence"). Furthermore, the observation has often been made that in the east at the end of this period of Ash'arite domination, that is, in the 7th/13th century, Khwājah Naṣīr al-Dīn Ṭūsī answered both Shahrastānī and Rāzī and resuscitated Ibn Sīnā's philosophy. In general one points of Suhrawardī as the only major philosopher in this period of the eclipse of philosophy in the east whose influence, however, really began in the decades which coincides with Ṭūsī's revival of Ibn Sīnā.

These statements are generally correct but should not be taken to mean that there was no philosophical activity in Persia and lands nearby during this period of domination of *kalām*. The most important proof of the continuation of the school of Ibn Sīnā in the 5th/11th and 6th/12th centuries is, in fact, 'Omar Khayyām himself. He lived in the middle of this period of eclipse of Ibn Sīnā philosophy, between Ibn Sīnā's students and Ṭūsī, and must be considered an eminent philosophical figure during this period of suppression of philosophical thought in Persia and other eastern lands of Islam. His very existence is proof of the fact that philosophy had not disappeared totally from the scene even during this period of eclipse. Nevertheless, the period during which he lived is also one of the reasons why in general histories of Islamic philosophy there is usually no mention of him as a philosopher belonging to the school of Ibn Sīnā. Had he lived earlier or later he would have been

agree with those who believe that some of the quatrains attributed by Khayyām were actually by him and must be considered as a source but not the source of his philosophical views.

As for those who rely solely on the quatrains, believing that Khayyām was hiding his skeptical and hedonistic views because of expediency, I find no logic in this argument except the psychological need of some modern skeptics to find historical precedence and therefore legitimacy for their innovations based on the premises of modernism. To accuse Khayyām of blatant hypocrisy while seeking to make of him a cultural hero for modern skeptics is itself the worst kind of hypocrisy hardly worthy of serious consideration.

In trying to understand the philosophy of Khayyām, therefore, we must turn to his own works in light of the intellectual and social conditions of his day and evaluations of Khayyām's works by such figures as Ṣahīr al-Dīn Bayhaqī, Niṣāmī 'Arūḍī Samarqandī and Jār Allāh Zamakhsharī, as well as the Sufi poets and writers who came shortly after him such as 'Aṭṭār and Najm al-Dīn Rāzī. In this essay it is not possible to investigate the secondary sources but a word can be said about the intellectual conditions of Khayyām's time before turning to the three sources of his philosophy: namely his scientific works, the philosophical texts and the poetry.

The establishment of Seljuq rule over Persia, Anatolia, Iraq and Syria led to a new political situation which also possessed consequences for the cultivation of philosophy. After over two centuries, the Seljuqs united Western Asia under the aegis of Sunni power, a power of which the Abbasid caliph remained the symbol although in fact military and political power remained in the hands of the Seljuq sultans. To strengthen the central power of Sunni authority, the Seljuqs, like the Abbasid caliphs, supported Ash'arite *kalām* and by extension combated the propagation of *falsafah* to which Ash'arism was opposed. It is not accidental that from the middle of the 5th/11th century onward, *kalām* came to dominate the intellectual scene in Persia and other eastern lands of Islam, especially Khurasan from which Khayyām hailed. One needs

begin the lesson, I stood up and walked to a shelf of books along the wall of the room to browse. I found one of the works of Mullā Ṣadrā inside which there were small pieces of paper with quatrains written by Ayatollah Qazwīnī very much in the spirit of some of Khayyām's quatrains. A few minutes later the master came in and became angry that I had found the poems. He said these are just doodlings not meant to be read by me. Suddenly I thought of how the quatrains that are authentic must be related to Khayyām and the rest of his works.

and its interpretation we are therefore dealing not only with an intellectual question but also with one which for some is an existential matter and touches the very foundations of their worldview for which they have sought historical legitimacy by identifying their personal and subjective states with Khayyām. Nevertheless, for the sake of intellectual honesty and the truth all these possibilities must be examined in light of Khayyām's written works even if there is a popularized Khayyām out there after whom night clubs are named all over the world, a figure whose image is difficult to erase in the minds of those, including a number of modernized Iranian writers, wooed by the Victorian Khayyām cult begun by Fitzgerald and its aftermath which survives in a new form to this day.

As far as positing two Khayyāms is concerned, we believe that there is no cogent reason for doing so especially if one accepts that only a few dozen of the quatrains are most likely authentic and the rest by other poets such as Ḥayyānī or Ḥayātī (as mentioned in some manuscripts of the *Rubā'īyyāt* in Persia and Paris) which could have been easily mistaken (in the Arabic/Persian script) by later scribes for Khayyām. If we take this fact into consideration, there is no need to accept all of the poems in his name as being his or go to the other extreme to negate the authenticity of all the poems attributed to Khayyām. Furthermore, the poems found in the most ancient manuscripts do not contradict his philosophical writings in principle as we shall see later in this essay. In fact it was common among Persian Islamic philosophers to write a few quatrains on the side often in the spirit of some of the poems of Khayyām singing about the impermanence of the world and its transience and similar themes. One need only recall the names of Suhrawardī, Afḍal al-Dīn Kāshānī, Naṣīr al-Dīn Ṭūsī and Mullā Ṣadrā who wrote some poems along with their extensive prose works not to speak of such philosophers as Nāṣīr-i Khusraw, Mīr Dāmād, Mullā 'Abd al-Razzāq Lāhījī and Sabziwārī who in contrast to the earlier group, wrote poetry extensively. And this tradition has continued to our own day.¹⁰ I therefore tend to

(10 In the 1960's we had the honor of studying the *Asfār* of Mullā Ṣadrā for several years with the late Sayyid Abu'l-Rafī'ī Qazwīnī in both Tehran and Qazwin. This venerable master was a grand ayatollah, a *marja'ī taqlīd* (a source of emulation in matters of the *Sharī'ah* as well as being one of the greatest masters of the school of Mullā Ṣadrā in his day along with being an authority in traditional mathematics. His countenance was always serious and of course he exuded religious authority by his very presence. One day while a group of us consisting of B. Forouzanfar S. J. Āshtiyānī and others were waiting in his study in Qazwin for the master to come and

sible, each of which needs to be stated and then examined. One is that the philosopher-scientist Khayyām was not the same Khayyām who is the author of the quatrains bearing his name. A number of scholars in East and West have accepted this position and many have sought to give as proof the fact that Niẓāmī 'Arudī Samarqandī in his *Chahār-maqāleh* mentions Khayyām in the third chapter of his work as an astronomer and not in the second chapter as a poet.⁷ A second group has doubted the authenticity of most of the quatrains and has accepted that Khayyām may have written a few of these as a pastime without meaning to describe his complete philosophy of life therein. Another group asserts that the world loving, skeptical, and fatalistic philosophy expressed in the quatrains expresses the thought of the "real" Khayyām, while the existing philosophical treatises are simply formalities which he produced because of the conditions of the world in which he lived required his composing such works.

It is of interest to note that as modernism brought a wave of religious lukewarmness and even skepticism among a number of Iranians, it also made the Khayyām "packaged" in the West a cultural hero of those who had become philosophically skeptical and agnostic. For example, Taqī Arānī, who was the intellectual leader of the Iranian communists in the period before the Second World War, was much interested in Khayyām but because of his own "scientific materialism" turned to the study of Khayyām's mathematics rather than his poetry which did not accord with communist teachings. Also Iran's most famous modern writer, Sadegh Hedayat, who was an agnostic and anti-religious activist, did much to introduce the new skeptical view of Khayyām among modernized Persians⁸ to the extent that some by mistake think of him as the founder of Khayyām studies in Iran.⁹ In fact no figure in Persian literature has been used as often as Khayyām in modern times to depict whatever sense of rebellion, doubt, hedonistic tendency or even feeling of suicide might have existed within the mind of the modern interpreter of Khayyām in question. In dealing with the philosophy of Khayyām

(7 See for example, *Nā'inī*, *op. cit.*, pp. 2-3.

(8 See Hedayat *Tarānihā-yi Khayyām*, Tehran, Rawshanā'ī Press, 1313, (A. H. solar).

(9 See M. M. Fūlādward, *Khayyām-shināsī*, Tehran, Bīnā Press, 1347 (A. H. solar). See also his "Sahm-i Hedayat dar shināsānīdan-i Khayyām", *Farhang*, *op. cit.*, pp. 33ff. We agree fully with Fūlādward's assessment of how Hedayat, like so many modernized Iranians after him, was reading his own inner thoughts and states into the Khayyām he had created in his mind.

works have not received anywhere the same attention in the Occident as have his scientific or poetic writings to the extent that he hardly figures in general histories of Islamic philosophy written in Europe.⁴ It has become usually forgotten that in traditional Islamic sources he was known to essentially as a philosopher-scientist. Zamakhsharī referred to him as “the philosopher of the world”⁵ and his son-in-law, Muḥammad Baghdādī, is said to have stated that Khayyām was busy teaching the metaphysics (*ilāhiyyāt*) of Ibn Sīnā’s *al-Shifā’* (“The Book of Healing”) when he died.⁶ Many other sources have also testified that he taught for decades the philosophy of Ibn Sīnā in Nayshapur where Khayyām lived most of his life, breathed his last, and was buried and where his mausoleum remains today a famous site visited by many people every year.

It is in light of these contradictory evaluations of Khayyām and especially the eclipse of his significance as a philosophy in the line of the Islamic philosophical tradition that we wish to turn to a study of his philosophy on the basis of what has remained of his writings.

I. Before embarking upon this task, however, it is necessary to confront the question of his quatrains and the “philosophical” meaning that many have associated with it in the West and also in other areas of the world, including those parts of the Islamic world where people’s knowledge of Khayyām has come primarily through Western sources. The quatrains in Fitzgerald’s translation convey at least superficially a hedonistic, fatalistic and this worldly philosophy combined with much skepticism about religious teachings if not God Himself. One might ask how could this Khayyām be the same man who wrote the extant philosophical works or who was so respected as a scholar of religious stature that the Islamic judge of the province of Fars would send him a letter asking him philosophical and theological questions? Several responses are pos-

(4) We have devoted a short study to his philosophical ideas in our *The Islamic Intellectual Tradition in Persia*, ed. M. Amin Razavi, London, Curzon, 1996, “Umar Khayyām: Philosopher-Poet-Scientist”, pp. 175-177.

(5) In his *al-Zājir li’l-shighār ‘an mu’aradāt al-kibār*, quoted in B. Forouzanfar, “Qadimītarīn iṭṭilā’ az zindigī-yi Khayyām”, *Nashriyya-yi Dānishkada-yi adabiyyāt-i Tabriz*, 1327 (A. H. solar), pp. ff.; quoted by S. M. Riḍā Jalālī Nā’inī, “Ḥakīm ‘Omar ibn Ibrāhīm Khayyām-i Nayshābūrī”, in *Farhang* (Tehran), vol. 12, no. 29-32, Spring 2000, p. 4.

(6) In his *Kharīdat al-qasr*, ‘Imād al-Dīn Kātib Iṣfahānī says about Khayyām, “There was no one like him in his own time and he had no peer in the science of astronomy and philosophy.”

The Poet-Scientist Khayyām as Philosopher

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Introduction

Omar ibn Ibrāhīm Khayyām-i Nayshāpūrī (439/1048-526/1131) known in the West simply as Omar Khayyām is the most famous Asian poet in the West¹ and since the 19th century efforts by historians of science such as Amélie Sédillot and Franz Weopcke followed by many 20th century scholars, he has also become established as one of the major mathematicians and astronomers of the medieval period, the author of the most important treatise on algebra before modern times,² as well as a significant work on the criticism of the Euclidean parallel lines postulate.³ His reputation is therefore well established as both a poet and a scientist. What is much less known about him, however, is his significance as a philosopher and his few remaining philosophical works have not received anywhere the same attention in the Occident

(1 Thanks of course to the free translation of a number of quatrains by Edward Fitzgerald which created something of a cult in Victorian England, the like of which has not been seen in modern times. There is a whole library of works on Khayyām's quatrains written in various European languages.

(2 On Khayyām as mathematician see D. Struik, "Omar Khayyam, Mathématicien", *The mathematics Teacher*, vol. 51, April 1958, pp. 280-285; A. P. Youschkevitch, *Les mathématiques arabes* (VIII-XV siècles), translated M. Cazevane and K. Jaouiche, Paris: J. Vrin, 1976; and especially the recent comprehensive work of R. Rashed and B. Vahabzadeh, *al-Khayyām mathématicien*, Paris, Librairie Scientifique et Technique Albert Blanchard, 1999.

(3 On Khayyām treatment of the fifth postulate of Euclid, see A. Amir-Moéz's partial translation of Khayyām's treatise, "Discussion of Difficulties in Euclid", *Scripta Mathematica*, vol. 24, 1959, pp. 275-303.; and J. Aghayani-Chavooshi, *Ḥakīm 'Umar Khayyām*, Nayshābūrī, Tehran, Iranian Academy of Philosophy, 1979.