'ALÂ AL DÎN AL MANṢÛR'S POEMS ON THE ISTANBUL OBSERVATORY

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The poems which are presented here, in their Persian text as well as in Turkish and English translations and together with the pictures belonging to the first part of the text (couplets 1-139), are taken from a Persian manuscript of the Istanbul University Library. It is registered there under F 1404. It is richly illustrated and illuminated. Its binding is also quite elaborate, but from the standpoint of penmanship the artistic value of the book is somewhat lower. It contains 153 folios.

The name of the book is *Shahinshâhnâma*. According to the information given on page 153a, the author's name is 'Alâ al Dîn al Manṣûr; and he was from Shîrâz, in Persia. In his concluding poems on pages 152b and 153a the author states that he has completed this book in the year 989 of the Hegira, on the last day of Ramaḍân (October 28, 1581), and adds that this is the first volume of his work and expresses hope that he will be able to prepare the second one too.

The book is a chronicle dealing with the earlier parts of the reign of Sultan Murad III, Ottoman king (1574-95), and it is all in verse and in the Persian language. It starts out with poems praising God and the Prophet, and these are followed by poems on the coronation of Murad III. The rest of the book consists of poems on miscellaneous events of historical importance. It is in accordance with this scheme that the poem about the Istanbul Observatory finds its place in the book. The poem on the comet of 1577 forms a kind of introduction to the one dealing with the war with Persia.

The picture showing the astronomers in a group was published before by Fehmi Edhem and Ivan Stchoukine[1] and that of the

[1] Fehmi Edhem et Ivan Stchoukine, *Les manuscrits orientaux illustrés de la Bibliothèque de l'Université de Stamboul*, Paris 1933, plate 3, fig. 6.

comet by A. S. Ünver.[2] In his Archives of the Institute of the History of Medicine, Istanbul University, Professor Ünver has beautiful reproductions of the three pictures of this text, namely the above-mentioned two as well as that of the armillary sphere, and he kindly showed them to me; Dr. Adnan Erzi, assistant professor of history, Ankara University, had, on a previous date, drawn my attention to the picture in Edhem and Stchoukine. My contact with the present text has been through these items of information. To my knowledge, the text of these poems has nowhere been published or analyzed before.

The text is not very easy, in the sense that at times it is not very clear. This is apparently because the requirements of versification have at times had the upperhand over those of clarity in meaning. The script is very legible, however, and as will be noticed, only few corrections had to be made. In a few instances, obvious corrections of dots and certain additions of diacritical marks were made without indicating them in the footnotes. In the translations I have tried to keep each couplet and even each hemistich independent, and only rarely has this proved impossible.

The numbers assigned to the couplets are mine. Couplets 1-139 belong to pages 55a-58b, and couplets 140-176 are from pages 144a-145a, near the end of the book. The uninterrupted sequence from 139 to 140 in these numerals and their beginning with number 1 are, therefore, for convenience of reference and are not in conformity with their place in the complete text of the *Shahinshâhnâma*.

Poems on observatories are extremely rare in Islamic literature, although certain hills where observatories were located for a short time were praised by poets for their beautiful views. I have appended an Arabic poem on Naṣîr al Dîn al Ṭûsî and the Marâgha Obsevatory in my paper read at the Naṣîr al Dîn al Ṭûsî Congress held in Tehran during the last week of April, 1956,[3] and apparently these two are the only ones of their kind that have come to light so far. The present poem is much longer and much more detailed compared to the one on the Marâgha Observatory, however, and it constitutes a very valuable document. In fact, thanks to this poem,

[2] *Vatan* (A daily newspaper of Istanbul), January 24, 1950.
[3] *Dil ve Tarih-Coğrafya Fakültesi Dergisi*, vol. 14, 1956, p. 13

our information concerning the Istanbul Observatory has enriched considerably.

As will be observed, this poem abounds in exaggerated statements and poetic expressions. But in matters pertaining to the Istanbul Observatory, which are the only ones relevant to us here, it appears to be very accurate, so far as we have the possibility of comparing them with information deriving from other sources. We may therefore consider it reliable in items of information in which it constitutes, for the time being at least, our only source.

From couplet 107 it is clear that the poems concerning the foundation of the Observatory were written before the demolition of that institution, and this is rather fortunate. For these poems are written in a spirit quite different from those concerning the destruction, where the poet undoubtedly had to be tactful. Had he written concerning the whole event after the destruction of the Observatory, his poems concerning the foundation too might have been brief as well as pervaded by antiscientific and fatalistic attitudes instead of the enthusiasm and confidence in astrology prevailing at the time of foundation. From the part listing and describing the scientific work accomplished in the Observatory, it becomes quite certain, however, that these poems were written at a time which was pretty close to the end of that institution.

Up to the present time, practically all our information concerning Istanbul Observatory was contained in an article by Mordtmann,[4] and since the publication of that article practically no new sources had been published on the subject. From Mordtmann's article the date of foundation of the Observatory could not be determined clearly, and as some of the available dates were very close to its date of demolition, which is known quite precisely, it seemed likely that no work of any importance took place in that institution.

The vagueness of our information concerning the date of foundation of the Observatory arises partly from the fact that the creation of such an institution naturally takes some time, and a second complication is due to the possibility of confusing statements con-

[4] J. H. Mordtmann, *Das Observatorium des Taqî al Dîn zu Pera*, *Der Islam*, vol. 13, 1923, p. 82-96.

cerning the activity of constructing tables with that of constructing buildings or instruments.

From a statement of Al 'Urḍî, one may guess that the construction of the instruments of the Marâgha Observatory took not less than three years.[5] It is natural enough, on the other hand, that observations should start before the completion of all the instruments, and that the construction of the instruments should be put into an order for such purposes. There is a slight indication of the possibility of the existence of such a procedure in the Marâgha Observatory,[6] and couplet 106 of our poem too seems to refer to such a situation in connection with the Istanbul Observatory.

It is stated here that Taqî al Dîn started full-scale observations in the year 985, with all necessary preparations of major and minor importance completed. The year 985 extends from March 1577 to March 1578. This could be taken to mean the earlier parts of 985, since in the chronologically arranged sequence of the text it precedes the appearance of the comet which took place on the first night of Ramaḍân, 985 (November 12, 1577), i.e., during the ninth month of that year. With this poem, therefore, we have clear information concerning the year of the completion of the Observatory, but the date of the beginning of the construction or of the royal decree for its foundation remains unknown.

The life of the Observatory came to an abrupt end. It was demolished in January 1580.[7] Up to the present, our information concerning the date of foundation of this institution rested mainly upon the following items. A decree of 1578 that a certain collection of books be placed at the disposal of Taqî al Dîn, the Director of the Observatory[8], suggested that the Observatory had probably been completed at that time. European documents of the later months of 1577, i.e., two letters of S. Gerlach, also indicated that the Observatory, with some of its instruments at least, had reached the stage

[5] Hugo J. Seemann, *Die Instrumente der Sternwarte zu Marâgha nach den Mitteilungen von Al 'Urḍî*, *Sitzungsberichte der Physikalisch-medizinischen Sozietät*, Erlangen 1928, vol. 60, p. 27.

[6] Seemann, *ibid.*, p. 43.

[7] Mordtmann, p. 83.

[8] Mordtmann, p. 82.

of completion in or before those months,[9] but again it was not clear from these statements whether there was some construction work still going on or not. Gerlach refers to a projected work of seven years[10] and at a later date, Schweigger reports that Taqî al Dîn has worked for nearly seven years.[10] 'Aṭâî, moreover, states that the Observatory was demolished just when work had neared completion.[11] From these statements Mordtmann concludes that the construction of the Observatory was to take seven years and that it probably started in 1575.[12] Hence, the conclusion and impression that no work was done in the Observatory.[13]

Even without the present poem it was quite clear that the "work" mentioned in connection with the Observatory referred to work done in the Observatory and not solely to construction activity. Mordtmann also takes the work "raṣad-i-jadîd" to mean "the new method" instead of the "new observations" or "the new Observatory",[14] and this is instrumental in leading him to the idea that Taqî al Dîn introduced new European methods into Turkey, besides shading the meanings of the statements from the viewpoint of work done in or on the Observatory. The source statements in question are quite clear and traditional, however, and occur in connection with the foundation of practically all the earlier Islamic observatories concerning which we are in possession of some statement with respect to the reason and purpose of their foundation.

The "seven years" in question could refer to an observation program of that duration, since one source speaks of a projected work of seven years. On the other hand, however, as mentioned before, 'Aṭâî says that work had almost been completed when the Observatory was demolished and Schweigger states that Taqî al Dîn spent nearly seven years with the instruments. The period extending between 985 and the date of demolition becomes too short, therefore, and the interpretation of couplet 106 as meaning that there

[9] Mordtmann, p. 85, 86.

[10] Mordtmann, p. 86, 87.

[11] Mordtmann, p. 83; 'Aṭâî, *Dhyal al shaqâiq*, 1268, vol. 1, p. 286.

[12] Mordtmann, p. 88.

[13] Mordtmann, p. 88; A. Adıvar, *Osmanlı Türklerinde İlim*, Istanbul 1943, p. 84.

[14] Mordtmann, p. 83, 89, 93, 94, 95.

was some activity in the Observatory before it was fully completed becomes not only reasonable but also necessary. It should be noted that couplet 71 also is probobly in agreement with such an interpretation.

When we assume with Mordtmann that the construction of the Observatory started in 1575, this would leave less than three years for construction activities and would allow, at the most, for nearly three years' full-scale work, and the total number of years would hardly reach five. One might have therefore ventured to guess that the construction of the Observatory started in 1574, but this happens to be practically impossible. For the initial acts concerning the foundation of the Observatory occurred during Sultan Murad's reign which started in December 21, 1574 (8 Ramaḍân 982). [15]

Our poem does not specify the date of the initial acts of foundation, but the poem concerning the Observatory follows an item about conquests in Marrâkash and the arrival of a letter and presents from the governor of Morocco. These seem to refer to certain events which took place in 1574 and 1575, [16] and therefore the year 1575 appears to be a very good assumption and quite correct.

'Aṭâî says, "...the matter having been presented to the viziers also, in the year 987, which is in the beginnings of Murad Khan's reign, the observation well was brought into existence on the hill over Topkhâna and its cost was paid out of the Royal treasury". [17] This passage has been interpreted as indicating the date of the beginning of the foundation of the Observatory, [18] and as 'Aṭâî states in the same passage that the Observatory was demolished on 4 Zilḥijja 987 (January 21, 1580), this leaves less than a year for the life, or better, the birth of the Observatory. This text of 'Aṭâî may possibly explain the statement of another source to the effect that the Observatory was founded in 987 and demolished after a year's time. [19]

As the first date mentioned in 'Aṭâî is undoubtedly wrong, one may think that the mistake belongs to the printed text only. I have

[15] İ. H. Uzunçarşılı, *Osmanlı Tarihi*, vol. 3, part 1, Ankara 1951, p. 42.

[16] Uzunçarşılı, *ibid.*, p. 46.

[17] *Op. cit.*, vol. 1, p. 83.

[18] Mordtmann, p. 83.

[19] An unpublished notebook of Ḥusayn Aywânsarâyî. See A. S. Ünver, *Ali Kuşçi*, Istanbul 1948, p. 77-78; see also note 56 below.

consulted a good manuscript of this work, however, and the text there is exactly the same. [20] The first date given by 'Aṭâî is therefore wrong, the only alternative being that after the completion of the Observatory and the initiation of full-scale work in it in 985, an observation well was added to the institution in 987.

One point does not seem quite satisfactory, and this is that we have not been able to account for the contention that Taqî al Dîn spent nearly seven years on this matter. The author of the *Rawḍa al abrâr* gives a date for the destruction of the Observatory which is not the same as that given by 'Aṭâî. The former gives the Muḥarram of 988 [21] while 'Aṭâî says 4 Zilḥijja 987, but as they differ by one month only, this does not have much effect on the point in question. In our poem the date of demolition is not specified, but shortly after it (on page 149a) comes a poem concerning the death of the Grand Vizier Ahmed Pasha, and this took place in the third month of 988 (April 1580).[22]

The date 981 is the eariest specifically mentioned date which occurs in connection with some of Taqî al Dîn's work of constructing the astronomical tables, [23] and this would straighten out the problem of accounting for an activity which lasted for nearly seven years. It is possible, therefore, that Taqî al Dîn, who became head-astronomer in 979, i.e., before Sultan Murad's reign, had procured certain portable instruments and had started systematic work with them. Thus the "seven years" may include this preliminary activity also.

It is of interest in this connection that, as mentioned below, an eclipse of the year 984 was observed from the house of Khwâja Sa'd al Dîn and not from the Observatory. For this would appear as a negative evidence, though not a conclusive one of course, so far as our interpretation of couplet 106 is concerned, namely that work started in the Observatory before all preparations and construction work were completed.

[20] Istanbul University Library, T 1201, p. 163a.

[21] Qara Chalabî Zâda 'Abd al 'Azîz, *Rawḍa al abrâr*, Cairo 1248, p. 462; see also, A. Adıvar, p. 84, note 1.

[22] Uzunçarşılı, *ibid.*, vol. 3, part 2, p. 340.

[23] See note 37 below.

In short, it is very likely that the "work" mentioned in our sources includes some of Taqî al Dîn's activities prior to the construction of the Observatory, and that, in addition and more specifically, it refers to both construction and observation in connection with the Observatory, but this could hardly have been meant in the sense of non-overlapping construction and observation. For in such a case, our sources would imply that the observation program planned was not longer than three years at the most, and this would not be reasonable. Indeed, although the kings were anxious to shorten the observation programs and the astronomers naturally had to comply with such desires, the ideal observation program was one of not less than thirty years, corresponding to a complete revolution of Saturn, the planet of the longest period, for the astronomers of Islam.

In fact, it is related that when, in the course of the deliberations connected with the foundation of the Marâgha Observatory, Hûlâgû found out that the observations needed for the construction of the projected tables would, in accordance with the recommendations of astronomers of earlier times, take thirty years, he was so disappointed that the original project had to be altered and a new observation program of twelve years had to be arranged. [24] Again, Ismâ'îl I, Ṣafawî king of Persia (1502-24) gave up his project of having the Marâgha Observatory reconstructed and revived, when he found out that the improvement of the existing tables necessitated an observation program lasting for thirty years. [25] 'Abd al Mum'în al 'Âmilî, writing in 1562-63, also speaks of the necessity of thirty years' observation programs. [26]

The objection of the kings to thirty years was of an astrological nature; they were anxious to profit personally from the new tables. Muḥammad ibn 'Alî al Wabkanwî, author of the *Zîj al muḥaqqaq al sulṭânî*, written for Abû Sa'îd Bahâdur Khân (1603-63), the Uzbek King, also points to the necessity of thirty years' obsrvation

[24] Naṣîr al Dîn al Ṭûsî, *Zîj-i-Ilkhânî*, MS., Istanbul University Library, F 300, p. 4a; Ankara University, Library of the Faculty of Letters, İsmâ'îl Sâip Sencer Collection, No. 1-2829, p. 7b.

[25] M.F. Köprülü, *Marâga Rasathanesi*, Belleten, vol. 6, 1942, p. 225.

[26] Seemann, p. 125.

and adds that the existing tables were not accurate because they were not completed. [27]

It is very likely that, in order to make the new tables available as soon as possible, a program of seven years was planned, which took into consideration the previous observational activity of Taqî al Dîn and in which building activity and table construction largely overlapped. In fact, as we shall presently see, the tables constructed by Taqî al Dîn, contain even his observations made while in Egypt. In order to guarantee a decree for the foundation of the Observatory, Taqî al Dîn may have promised, as Schweigger's statement implies, to deliver the goods in seven years. But of course this would not mean that the life of the Obsrvatory would come to a natural end after these seven years. Indeed, in the Marâgha Observatory work continued for many years after the initial twelve years were spent and the *Ilkhânî Tables* completed. [28]

It is clearly seen therefore that the impression that no work was done in the Observatory is definitely wrong, and indeed, the present poem contains considerable information concerning this matter. In fact it is hard to see how the work mentioned in the poem could have been done unless work had started in the Observatory before its construction had reached the stage of completion, and even in such a case the work mentioned in the poem appears to be quite impressive. In view of the difficulty of reconciling the accomplishment of so much work with the shortness of the period of observations, especially with that of the period of full-scale activity, it would seem relevant that, as seen below, the scientific staff of the Observatory was quite large. If the conclusions concerning Taqî al Dîn's promise to prepare the new tables in a short time is correct, he must have relied on the availability of a large staff in making that promise.

This part of the poem is at times not very clear in its details, however, and it should be stated, moreover, that some of the statements in this part may be exaggerated. Fortunately, Taqî al Dîn

[27] MS., Ayasofya Museum Library, Istanbul, No. 2694, p. 2a . This passage is referred to by Ḥajî Khalîfa (*Kashf al ẓunûn*, Istanbul ed., vol. 2, 1943, p. 969).

[28] Aydın Sayılı, *Khwâja Naṣîr-i-Ṭûsî wa Rasadkhâne-i-Marâgha*, *Dil ve Tarih-Coğrafya Fakültesi Dergisi*, vol. 14, 1956, p. 8-9.

has left us a book containing his work in the Observatory, and the details in our poem could be compared with the contents of this book. This work is the *Sidra al muntahâ al afkâr*, and from it too it is clearly seen that substantial work was done in the Observatory.

This book of Taqî al Dîn has been examined to some extent from the view-point of the work done by its author. [29] The number of observations specifically mentioned in it is quite small, and I shall limit myself here to listing them. [30] It should be noted in this connection that Taqî al Dîn mentions in one place in this work that he has also made use of his observations dating back to his days in Egypt. [31]

In this work Taqî al Dîn refers to the observation of two solstices belonging to the same year (the second one is from Rabî' al awwal, 985) and to observations for the determination of the latitude of Istanbul. [32] An equinox observation of 987 and two observations of the sun, made with the armillary sphere and the quadrant, from the same year are also recorded. [33] Of the three eclipses mentioned, the first one (Rajab 984) was observed from the house of Khwâja Sa'd al Dîn, [34] and the second from the Observatory. The third one could not be observed because of clouds, but reports concerning it were received from Taqî al Din's freinds in Cairo and from Dâvûd, "the Mathematician", in Salonica, [35] a Jewish astronomer to whom certain other sources also refer without however mentioning his name.[36]

Although the number of observations specifically mentioned are thus quite small, there are a number of tables in the book, and, in conformity with the conclusion to be drawn from our poem, they give the impression that considerable work was done in the Observ-

[29] Ṣâliḥ Dhakî, *Athâr-i-bâqiya*, vol. 1, Istanbul 1329 H., p. 201-202; A. Adıvar p. 84.

[30] I shall refer to two manuscript copies of this work, both in Istanbul: Nuruosmaniye Library, No. 2930, and Topkapı Museum Library, Hazine, No. 465/1. The manuscripts bear different titles; see also, A. Adıvar, p. 83.

[31] N, p. 3a; T, p. 6b.

[32] N, p. 22a; T, p. 36b, 37b.

[33] N, p. 46a, 47a;. T, p. 75b-76a, 77a.

[34] N, p. 53a; T, p. 86b.

[35] N, p. 52b-53b; T, p. 85b, 86b-87a.

[36] Mordtmann, p. 86, 87, 96; A. Adıvar, p. 87 and note.

atory. At any rate, it would seem that only a few of the observations made are specifically indicated, and this appears to be the general practice in the astronomical tables of Islam. In connection with two of the tables given near the end of the book the dates 981 and 982 are mentioned.[37] It may be pointed out that as Taqî al Dîn became head-astronomer in 979[38] and was in Istanbul at that time, these cannot be connected with his Egyptian observations. As they are before Murad's reign, on the other hand, they cannot have any direct connection with the Observatory either. I have already touched the question of their possible significance to our present topic.

The second hemistich of couplet 93 refers to the determination of distances from the equator. The corresponding item in the *Sidra al muntahâ* seems to be the tables of the "first declinations, their sines and their tangents".[39]

It is of interest that according to couplets 144 and 145 Taqî al Dîn stated to the King that the observations had been brought to completion; these lines also inform us that Taqî al Dîn's opinion was taken concerning the demolition of the Observatory. It is said in these couplets, in fact, that it was he who recommended the bringing to an end of the Observatory. These items are not corroborated by our other sources. It is understandable that our poet should be cautious and tactful in relating a contemporary event, lest he incur the anger of the Shaykh al Islam and his freinds who had sealed the fate of the Observatory, and that he should leave out certain details concerning the demolition.

It would seem reasonable to assume, however, that Taqî al Dîn was notified beforehand of the decision, or that his opinion was asked by the Sultan. He may, in that case, have judged that the wisest answer, under the circumstances prevailing at the time, would be to consent to or even recommend the destruction of the Observatory. At any rate, the information given in this poem seems more likely and is probably more factual than the picture drawn for us by 'Aṭâî,

[37] T, p. 91a, 98a. See also, A. Adıvar, p, 83.

[38] 'Aṭâî, *ibid.*, vol. 1, p. 286.

[39] N, p. 23a; T, p. 38b. For the meaning of the term "first declination", see E. Wiedemann, *Über die Astronomie nach den Mafâtîḥ al 'ulûm*, *Beiträge*, XLVII, *Sitzungsber. d. Phys.-med. Soz.*, Erlangen 1915, vol. 47, p. 228.

according to whom the astronomers, while busy at their worthless work, were taken by surprise by the recking squad who "took these credulous people out of that pit of misfortune".[40]

Gerlach and Schweigger mention certain instruments in connection with the Observatory, but Mordtmann has not dwelled upon the question of the equipment of this institution. Wiedemann has published a list of these instruments on the basis of *Sidra al muntahâ*.[41] The manuscript studied by him has apperantly certain small errors, however, as is evidenced by the addition of one instrument called *dhât al shafatayn* to the list and the occurrence of the equatorial ring as one actually constructed for the Observatory. Dr. S. Tekeli, in her recently completed Ph. D. thesis, [42] prepared under my direction, has made a careful study of the instruments of this Observatory on the basis of *Sidra al muntahâ* as well as the *Âlât al raṣadîya li zîj-i-shahinshâhîya*, a Turkish book written with the special purpose of describing the instruments of that institution and prepared by an unknown author on the basis of Taqî al Dîn's notes.

With respect to the instruments of the Observatory the present poem is in full agreement with the latter book and it shows only slight differences compared with the information given in *Sidra al muntahâ*, and it is helpful, therefore, in establishing the actual list of the instruments of the Observatory.

The present poem gives us, moreover, an idea concerning the number of people working on each instrument and the general manner in which they cooperated with each other. The somewhat strange expression in couplets 90 and 91 should bei nterpreted as the cooperation of four people on some instruments and five on others. Our picture of the armillary sphere shows five people at work on it. The Topkapı Museum copy of the above-mentioned *Alât al raṣadîya*[43] has clear pictures showing usually four people, and in certain instruments, such as the armillary sphere, five people working toge-

[40] 'Aṭâî, *ibid.*, vol. 1, p. 286.

[41] E. Wiedemann, *Definitionen verschiedener Wissenschaften und über diese verfasste Werke, Beiträge*, LVII, *Sitzungsber.....*, 1918-19, vol. 50/51, p. 26-28.

[42] *Nasîruddin, Takiyüddin, ve Tycho Brahe'nin Rasat Aletleri*, in Turkish, unpublished.

[43] Topkapı Museum Library, Hazine 452.

ther. This kind of information exists at least in one other case,[44] but it is very rare although there are references to the importance and necessity of team-work in making astronomical observations. [45]

In enumerating the Observatory instruments, Taqî al Dîn, as well as his unknown editor, does not say anything concerning small portable instruments and auxiliary equipment. Many such items are seen in the picture of our poem showing the astronomers together, however, and our European sources too mention celestial and terrestrial globes. [46] Couplets 30-33, where Taqî al Dîn's activity of the nature of map-making is praised may also refer, at least partly, to the preparation of such equipment for the Observatory. Likewise, the double plural *âlâthâ* in couplet 105 may be intended to include such equipment as well as the main instruments.

It is interesting that although the Marâgha Observatory had a rich collection of such minor instruments and equipments,[47] Al 'Urḍî does not mention such things either. This seems to represent an Islamic tendency to make a sharp distinction between observatory and field, or fixed and portable, instruments.

Couplets 76-87 give the impression that the instruments were made ready before the site of the Observatory was chosen. As this does not seem reasonable, I have taken the term *asbâb wa âlât* in couplet 82 to mean "equipments and materials", and this is a perfectly permissible translation.

The poem gives the impression that the instruments were each constructed independently and that they did not form part of the observatory building and were not housed in it. In fact, the pictures of the *Âlât al raṣadîya* too indicate that this was the case. The instru-

[44] E. Wiedemann, *Zur Geschichte der Astrologie, Das. Weltall*, 1922, p. 112.

[45] Seemann, p. 108.

[46] Mordtmann, p. 87.

[47] Waṣṣâf, *Tazjiya al amṣâr wa tajziya al a'ṣâr*, Hammer-Purgstall ed. 1856, p. 99, India 1246 H., p.52; Mîrkhûnd, *Rawḍa al ṣafâ*, India 1332, vol. 5, p. 83; Khwandmîr, *Ḥabîb al siyar*, Tehran 1271, vol. 2, p. 36; Jourdain, *Mémoire sur les Instruments employés à l'Observatoire de Méragah, Magasin Encyclopédique*, 1809, vol.4, p. 48-50; A.L.A.M. Sédillot, *Mémoire sur les instruments astronomiques des Arabes, Mémoires de l'Académie Royales des Inscriptions et Belles Lettres de l'Institut de France*, Séries I, vol. 1, 1884, p. 201-202; M.L.P.E.A. Sédillot, *Prolégomènes des Tables d'Oloug-Beg, Cresthomathie Persane*, vol. 1, p. XCVIII; H. J. Seemann, p, 120.

ments were apparently placed out in the open just as in the case of the Jai Singh Observatories. [48] With the exception of one device which was inside of a dome and to which several sources refer, this seems to have been the case in the Marâgha Observatory too, [49] and this appears to be borne out also by the present state of the ruins at the Marâgha Observatory site.

It is to be noted that in the title of the main poem the word "instrument" occurs although it deals with all kinds of details pertaining to the foundation of the Observatory. This is probably not due to a mere accident. For the Islamic astronomers felt that the large fixed instruments constituted the most important part of the observatory, and in Islam their construction was considered to constitute the major part of the foundation of such an institution. The following passage bears witness to this fact.

Commenting on the statement of Naṣîr al Dîn al Ṭûsî that "in no age which was without a great and world-controling king has it been possible to build observatories", Ḥasan ibn Muḥammad al Nîshâbûrî says, "It is fixed in the minds of intelligent people that the works of kings are kings among works. This is especially true of observation programs. For this is a matter which cannot be accomplished except by the nod of approval of kings. This is not merely due to the fact that great expenditures are necessary for the erection and functioning of observatories and for equipping them with instruments. For if this were the only reason, people well-versed in these matters could call upon the assistance of wealthy personalities.

"For the erection of an observatory there is need for the presence of accomplished and skilful masters who can convert the instruments from the conceptual state into the actual. As this is an extensive work and requires long time for its completion, it is impossible to limit oneself to and to be satisfied with the presence of a few only of such masters. It is necessary, on the contrary, to bring together all the masters of the time so that every one shall make manifest his own particular art; and moreover, by seeking the confirmation and approval of other experts in each case, all these instruments shall be attended to and constructed in the best manner possible in that age.

[48] G. R. Kaye *The Astronomical Observatories of Jai Singh*, Calcutta 1918.
[49] A. Sayılı, *ibid.*, p. 3-4.

Now, there is no doubt that to assemble the masters of this art from all corners is possible sometimes by showing kindness to them, and in other cases by compulsion and harshness; but kindness is more effective when it comes from kings and coersion can be exercised only by them.

"Thus for the purpose of the invention of astronomical instruments, the establishment of methods for making observations with them, and for discovering expedients and dexterous ways for their manipulation and utilization, it is necessary to bring together wise men from all corners so that their experience and knowledge will be pooled together; the realization of the projected observations will thus become more certain and the results obtained will come closer to the truth. . . ." [50]

Couplet 89, as confirmed by the picture of the group of astronomers to which it is appended, is of great interest. Counting Taqî al Dîn, there were sixteen astronomers working in the Observatory. This is an entirely new item of information. We had absolutely no idea of the number of astronomers working in this institution, and there were no clues indicating the existence of a large scientific staff. Some of these sixteen men may not have been full-fledged astronomers. If we imagine them as four groups observing simultaneously on four instruments, we may divide them in the following manner: Eight observers, four clerks, and four men giving miscellaneous assistance. One should guess that there were other administrative officers and men doing menial work. For the wording of the couplet in question would indicate that the sixteen men mentioned were all astronomers.

We do not know how large a library this Observatory had. It is only known that a collection of books was sent to the Observatory.[51] In the picture showing the astronomers together, book shelves are seen in the background, but undoubtedly this must represent a small part of those existing there.

One of the most interesting items of information contained in this poem is the existence of a small-scale observatory in addition to the main building, as mentined in couplets 88 and 85. It would

[50] *Sharḥ-i-Zîj-i-Ilkhânî*, MS., Bursa, Haraccioğlu, No. 1163, p. 6a-6b.

[51] Mordtmann, p. 82.

be very desirable to have clearer and more detailed statements on these matters. We apparently see the group of astronomers at work in this Small Observatory. The picture, in fact, represents a small building, with its tiled roof, and it is a place prepared for work of the nature of calculation, drawing, and small-scale observations; and the couplets in question are written on this picture.

The main instruments were apparently placed out in the open. What, then, was the nature of the main building, and what were its functions? Our fourth picture, taken from the Topkapı Museum copy of the *Âlât al raṣadîya li zîj-i-shahinshâhîya*, seems to help us clarify the general situation. It, first of all, serves to confirim our decision that the previous picture represents the Small Observatory. For the present picture shows a much more elaborate building. It also seems to have ornamental metallic parts and coverings as mentioned in couplet 86.In conformity with our previous conclusion, this larger building does not show any signs of having been designed so as to contain any major instruments, and the chimneys seen close together in the middleground would suggest that the building was partly a dwelling-place for the astronmers of the Observatory.

The existence of a large and a small observatory brings to mind the observatories of Tycho Brahe and also certain items of information concerning the Marâgha Observatory. But our knowledge in this matter is not detailed enough, and I shall not try to elaborate on the possibility of definite parallelisms in this direction.

Our picture of the Small Observatory shows small astronomical and geometrical instruments as well as other appropriate observatory equipment. The building with a dome in the Marâgha Observatory also contained such equipment. [52] As it has seemed reasonable to assume that Taqî al Dîn had certain personal instruments with which he made observations before the foundation of the Observatory, it is likely that these were placed in the Small Observatory later on. We know that Naṣîr al Dîn too was in possession of portable instruments before the Marâgha Observatory came into existence. [53]

[52] See notes 47 and 49 above.
[53] A. Sayılı, *ibid.*, p. 2.

It is possible that the Small Observatory contained piloti nstruments, and that this constituted and determined one of its functions. Al 'Urḍî speaks of an instrument which seems to have been constructed for such a purpose, but this was placed by the side of the larger instrument in conjunction with which it was used. [54]

In Aywânsarâyî's note book referred to above [55] there is mention of a large tower, in connection with the Observatory. It is said that the tower was left intact when the Observatory was demolished. He also speaks of a dome or spire on top of the tower. It was blown off in a violent storm which took place in 1089 H., and this caused the death of a man. The top was later restored and at one time a cannon was housed in the tower. It is said to have nine windows and a staircase with 150 steps; it was equipped with pulleys and other mechanical contraptions serving to lift things to its top.

All this seems very interesting, but unfortunately the passage is full of mistakes. It gives the site of the Observatory as Galata, and speaks of its demolition during the reign of Sulayman the Magnificent, the grand father of Sultan Murad III. [56] The description given above may possibly be that of the Galata Tower, and the same confusion seems to exist here as in the passage from the *Ḥadîqa al jawâmi'* quoted by Mordtmann. [57]

Another important bit of knowledge obtained from the present poem is with respect to the reason and purpose for the foundation of the Observatory, and this appears to have been almost completely astrological. Although there were references to astrology in our other Turkish sources, this aspect of the undertaking was not completely clear; for these sources usually refer, in a general manner, to the necessity of renewing the available astronomical tables, and speak of astrology especially when mentioning the demolition of the Observatory.

The astrological motives were emphasized in our European sources, but they were not very confidence-inspiring in this respect. For these sources show a strong tendency of looking down upon

[54] Seemann, p. 86.
[55] See note 19 above.
[56] MS., Topkapı Museum Library, Hazine, No. 1565, p. 201.
[57] Mordtmann, p. 85.

Taqî al Dîn, and they reveal this tendency especially by referring to his pretentions of an astrological nature. In this poem, on the other hand, Taqî al Dîn's astrological activities are mentioned in a detailed fashion, and both in praising him and in trying to justify the act of demolition of the Observatory.

In fact, it is stated in the first parts of the poem that Taqî al Dîn enhanced the prestige of the mathematical and astronomical sciences by building the Observatory, and this is explained in a clear fashion as an increase of work and interest in astrology. It is specified, moreover, that astronomy proper was popular before the Observatory too, but that due to outdated tables astrological work of precision had become impossible and that Taqî al Dîn rectified this situation. In couplet 13 it is clearly stated that the neglected aspect of the science of the stars was the part dealing with astral influences.

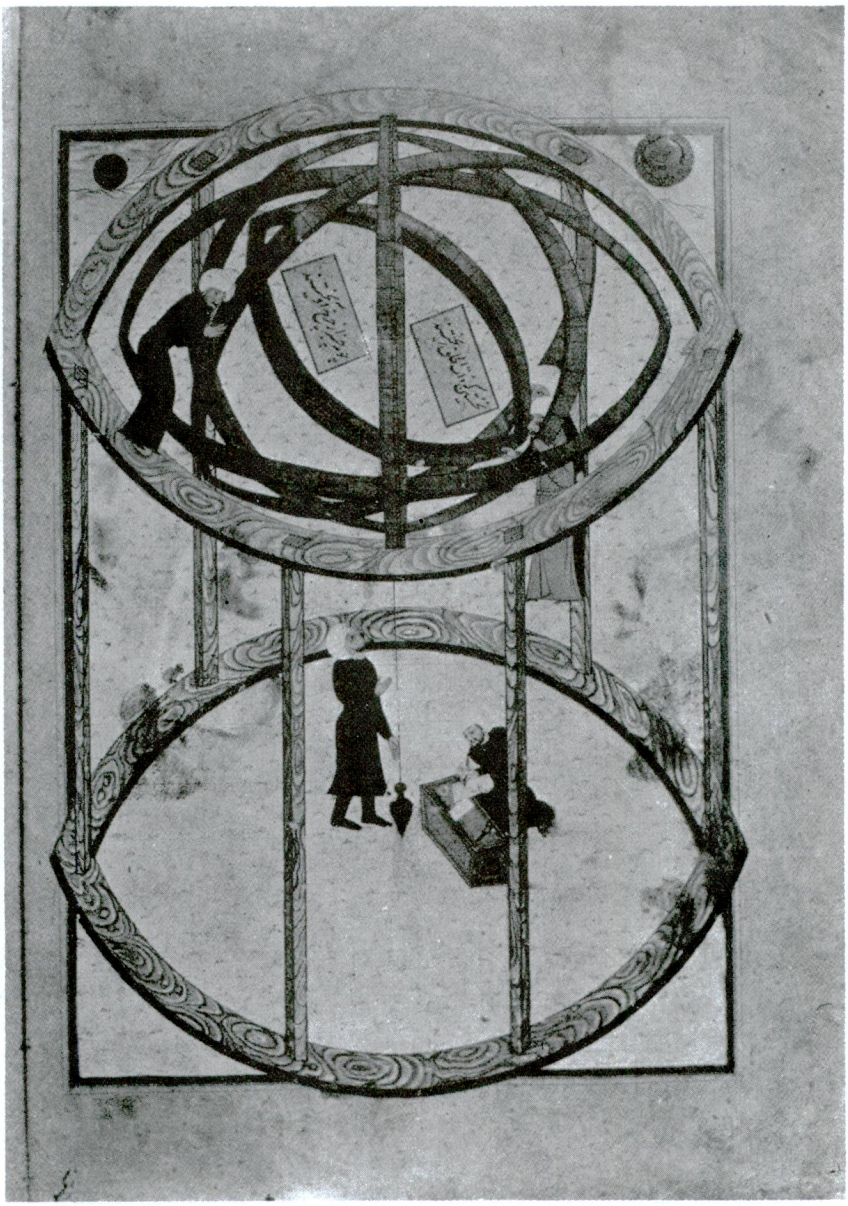
The poem on the comet, which is written in a predominently astrological vein, is of interest as it adds a voice from the Ottoman capital to the large literature collected on the subject. [58] Couplet 122, hemistich 2, and couplet 125, hemistich 1 bring to mind the conception of associating the comets with the super-lunar world. For in the former there is mention of "higher spheres" and in the latter the mention of passage through the "nine sections" of the ephemeral world. Number nine reminds one of the super-lunar regions, but the term "ephemeral world" rather suggests the sublunar region. As the sublunar region did not have nine sections, we should perhaps consider the "ephemeral world" to include the super-lunar regions also. This would appear reasonable in view of religious ideas over and above those of Aristotle's philosophy.

The idea of associating comets with the higher spheres occurs in Europe in connection with this same comet of 1577, [59] but clearly, the present poem does not allow us to draw, with any certainty, such conclusions on behalf of the Turkish astronomers of the Istanbul Observatory.

The part played by the Grand Vizier Sokullu Muhammad

[58] C. Doris Hellman, *The Comet of* 1577: *Its Place in the History of Astronomy*, New York 1944.

[59] Hellman, p. 118 ff.



Res. 1

Res. 2

Res. 3

Res. 4

Pasha in the foundation of the Observatory is emphasized somewhat more in this poem than in the previously known sources, and again, our poem teaches us something new concerning the family of Taqî al Dîn, if the meaning of couplet 47 has been understood correctly.

The present poem brings religious fanaticism and fatalism into prominence as the cause of the coming to an end of the Observatory. There were apparently certain misfortunes too, such as plague and military setback, which served to discredit astrology. The pessimistic remarks of our poet probably contain a hint to such circumstances. Finally, our poem constitutes a new source on Taqî al Dîn's connection with the "observation well" and on his observational activity in Egypt prior to his period of residence in Istanbul. [60]

[60] A. Sayılı, *The "Observation well"*, *Actes du Septième Congrès International d'Histoire des Sciences*, 1953, p. 542-550.

(METİN - TEXT)

ذکر ترتیب آلات رصد شهنشاهی

حکیم رصد بند انجم شناس — بنای رصدرا چنین بست اساس
که چون علم ادیان درین روزگار — فزودی بدانشوران اعتبار
شریعت قوی بود و دانش فزون — تصانیف نقلیه از حد برون
بشرارچه نقلیه درکار بود — ز عقلیه هم بحث بسیار بود
که تحصیل هر علم براهل دین — بود فرض بررد سائل یقین
خصوصاً ریاضی که اهل خرد — همی بردقایق از او پی برد
دفاتر ز علم حسابیش راست — فرائض از و نیز صحت فزاست
تقاویم آفاق و زیج رصد — ز ارباب این فن بهم میرسد
باین علم دانند بی اشتباه — بثور وحمل منزل مهر و ماه
چو در برج عقرب کند مه مکان — کریه است عقد اندرو بیگمان
باین علم دانند وقت نماز — وز وصحت قبله سوی حجاز
چو شد مس حاجت بآن این قدر — برو راغب ارباب فضل و هنر
و ز افلاك ز اهمال سفلیه اش — خفی مانده آثار علویه اش
شده زیجهای الوغ و نصیر — چو برخاك پوسیده نقش حصیر
کواکب برصاد در انتظار — چو بر زیج نو طالع بختیار
که ناگه بفر خدیو جهان — خداوندگار ملوك زمان
جهانگیر خاقان عالی نهاد — شهنشاه آفاق سلطان مراد
زمین چرخ سا سطح میدان اوست — قمر عکسی از گوی وچوگان اوست
خداوند اقبال یزدانی است — که خود ناسخ زیج ایلخانی است
بزیج ورصد تا که فرمان دهد — نجوم از افق برزمین رو نهد

چو کوشند با دولتش راصدان ربایند تاج از سر فرقدان
بایام او زیج نو هرکه بست ز فکر رصد تا قیامت برست
مهیا ز فرش همه خواسته جهان خلد مانند پیراسته
درین نازنین عهد ووقت لطیف بروز مبارك زمان شریف
25 بباب همایونش از قاهره بفیروزی دولت قاهره
بیامد یکی قاضیٔ با هنر ریاضیش ارثی پدر بر پدر 55 a
سریع القلم تقی دین نام او بعلم حسابی قلم رام او 55 b
بچستی رقمهاش در هر ورق ربودی خود از ابن شاطر سبق
عیان کرده اندر مجسطی نکات گشاده با قلیدس او مشکلات
30 زمین وزمانرا فراز ونشیب بپرگار وجدول رسوم عجیب
بپیموده بالجمله از عرض وطول نکرده ز فکرش یکی زان زهول
چو مژگان چشم وشعاع بصر همه قطر موهومیش در نظر
خبایای انظار را برده پی زوایای اقطار را کرده طی
رصد را یکی صد فزون از سلف نکوتر ز جمشید وبه از شرف
35 بفکر او تصور چنان کرده بود که بی چه رصد در زمین می نمود
که ارباب فهم وخرد پیش ازین نمودند بی چه رصد در زمین
خود این نیز در قاهره چاه کند برو نردبانی بفرمود بند
از آن چاه شد لختی انجم شمار که بیچاره گشت از رسوخش بکار
بچاه رصد چون چنین جهد داشت رسوخی من المهد الی اللحد داشت
40 شد او بر جناب معظم وزیر محمد بنام آصف بی نظیر
چه آصف ابو زرجمهر زمن ز حیرت فرو بسته پیشش دهن
ز رایش شده مقتبس آفتاب چو از جرم تابنده خور ماهتاب
جهان رام شه را ز تدبیر اوست ممالك خوش از عدل وتعمیر اوست

نموده چنان ضبط اقالیم را | که رصاد زیج تقاویم را
چو خواهد نماید بتوفیق حق | ز خاتم نمودار ذات الحلق
جناب رفیعش بود لا یزال | همی راغب اهل فضل و کمال
وزو تقی دین را برادر بکام | بسنجق بر آمد نجم بیك نام
خود او نیز این‌گونه امید داشت | که از تخم دانش درود آنچه کاشت
چو بوسید دامان صدر زمن | بعزت برون گشت از آن انجمن
روان شد سوی خواجهٔ کامبین | وحید زمن نامور سعد دین
در آمد بمنزلگهش باسلام | ببوسید دستش برسم کرام
ورا خواجه هم لطف و اکرام کرد | بشیرین سخن شکرین کام کرد
ز هرگونه دانش سخن ساز شد | ز علم ریاضی هم آغاز شد
چو قاضی زمین ادب بوسه داد | کلید در گنج حکمت گشاد
باو خواجه تردید کرد آنچنان | که قاضی کشید از مباحث زبان
چه خواجه محیط بحار علوم | دلش درج گوهر نثار علوم
سخنهای او چون در شاهوار | شده گوش ایام را گوشوار
گشاده بکلك از ثریا گره | تصانیفش از لب الالباب به
ز نظم و ز نثری که پرداخته | تواریخ را تاج سر ساخته
تلامیذ او هر یکی ذو فنون | بتألیف صاحب شروح ومتون
ازو فیثاغورث خجالت پذیر | وزو ارشیمدس نهان ناگزیر
رصدبست اگر ابرخس پیش ازین | شد آن کار ادنی تلامیذ این
حکیمان دانا دل هوشمند | بانواع کوشش بفکر بلند
بعلمش چو یا بند ره با دلیل | نمایند ازو جرّ جرّ ثقیل
دگر باره خواجه بلطف وکرم | نظر کرد بر قاضیٔ محتشم
دو سه دفعه مقدار ذاتش بدید | نکاتش بمیزان حکمت کشید

پسندید و بالجمله مقبول داشت سرش از تفاخر بگردون فراشت
پس از امتحان خواجهٔ نامور بدستور دستور نیکو سیر
بشاهنشه احوال او عرضه داشت بنفس نفیسش نه با عرضه داشت
70 شهنشه زعامت عطایش نمود باحسانش اندر رعایت فزود
نصیر و علی قوشجی آسا روان شد اندر رصد بستن او در زمان
بفر همایون چو درکار شد بهر کار او عون حق یار شد
ز اسباب فن هر چه او خواستی زمانه بدلخواهش آراستی
اگر بود مطلوب او در فلك همی یافت ره برسماك از سمك
75 وگر در زمین خواستی گنج وکان شدی از ته گاو ماهی عیان
مهیا شد القصه آلات کار فزونش زتوج ونحاس استوار
چو ذات الحلق لبنه کرد او تمام چنین ذات سمت ارتفاعش بکام
دگر چارمش ذاتِ ألشعبتین همی ربع مسطر ابا ثقبتین
دگر ذات الاوتار سعد اقتران مشبهة بالمناطق چنان
80 نبوده مشبهه خود پیش ازین نمود از مجسطی برون تقی دین
نکردست شخصی چنین شکل خوش درین فن زیبا بغیر خودش
چو اسباب وآلت بیاراستند زمین مناسب بآن خواستند
بسمت غلاطه سرای فرنك گزیدند صحرای فیروزه رنك
بدادند یك کیسه زر بهر خرج بدفتر درون مصرفش گشت درج
85 فلوری فرنگی چو خاك زمین بشد صرف اصل بنای متین
56 a درآن هندسی وضع گردون اساس فزودند رونق بتوج ونحاس
56 b نخستین که ذات الحلق ریختند چو مه چنبر از چرخ آویختند
56 b ز یکسو رصدخانهٔ مختصر نمودند نزدیکی آن مقر
57 a دروپانزده اهل علم گزین شدند از پی خدمت تقی دین

پس آنگه بترصید هر یك از آن ... بشد پنج تا فاضل نکته دان
دوسه راصد وکاتبش چارمین ... پی خدمت راصدان پنجمین
ز ذات الحلق یافت اهل عقول ... همه موضع کوکب از عرض وطول
هم از لبنه شد میل شمس آشکار ... دگر بعدها از معدل نهار
هم از ذات سمت ارتفاعش عیان ... نمودند با یکدگر راصدان
صعوبات حالات ناهید وتیر ... ز دور فلك گردش چرخ پیر
هم از ربع مسطر بشد بی نزاع ... پی ارتفاعش تمام ارتفاع
گرفتند از ذاتِ ألشعبتین ... بدین سان هم از ذاتِ ألثقبتین
تمام ارتفاع از نخستین بگاه ... چنان اختلاف نظرگاه ماه
نوشتند نیز از دوم جابجا ... مقادیر وابعاد اجرام [1] را
هم از ذات الاوتار چیزی نکاست ... که شد نقطهٔ اعتدالین راست
دگر از مشبه بی اشتباه ... بشد در رصد از سر انتباه
ز تدویر زهره بچرخ سیم ... عیان نصف قطرش نه بیش ونه کم
ز تحریر وتصحیح بنکام نیز ... عیان مطلع اختران ای عزیز
هم از مسطر محکم منتخب ... چه مسطر درین فن سنیدی لقب
بشد جمله تحریر بی حصر وحد ... رموزات آلاتهای رصد
چوکرد او بترصید حالاً شروع ... بسال ظفه با اصول وفروع
خدا اختتامش میسر کناد ... بفر همایون سلطان مراد
بده ساقیا جرعهٔ جانفزای ... شکن رونق جام گیتی نمای
که تا نشأه تازه پیدا کنیم ... ز عقد ثریا گره وا کنیم

57 a
57 b

[1] ابعاد واجرام را .

مطلع داستان

110 برآرندهٔ لعبتان سپهر — نهفتندهٔ مهرهٔ ماه و مهر
نشانندهٔ صولت برق و رعد — نگارندهٔ هیئات نحس وسعد
رساننده مه را بسلخ و محاق — خلاصی ده از ورطهٔ احتراق
رهانندهٔ جرم خور از کسوف — جلابخش قرص قمر از خسوف
گشایندهٔ عقده ها بی تعب — دراوج وحضیضش[2] زرأس‌وذنب
115 ز قدرت چنین کرده اظهارصنع — که هرگونه بنموده آثار صنع
گهی کرده نور از سیاهی پدید[3] — گهی از سیاهی فروکرده شید
شب اندر پی روز بنهاده روی — چنین روزِ روشن شده شام پوی
ز سیاره رونق فزوده بشام — ز خورشید رخشان بروزاحتشام
57b/58a ز هفت اختر و ثابتات فزون — نموده بسی حکمت از حد برون
120 ز تأثیر هر یك ازین اختران — بس اعجوبه ها را نموده عیان
ز اختر شناسی باهل خرد — نموده بسی گوشه از نیك و بد

در ظهور جرم ناری از اجرام فلکیه

عجبترکه از احتراق بخار — و ز آثار علویهٔ پر شرار
قوی شعلهٔ سبعه نحسات نام — لقب ذو ذؤابه سریع انتقام
شب غرهٔ ماه روزه ز غیب — زناگه درخشید بی‌شك و ریب
125 گذشته برین نه رواق سپنج — ز هجریه نهصد وهشتاد و پنج

---

[2] اوج حضیض .
[3] بدید .

فرا فرقدان طیلسانی ز نور — بسی شب برافراخت مانند هور
از و شام اسلامیان قدر شد — شعاعش جهانتاب چون بدر شد
براوج فلك تا چهل روز ماند — شراری زمغرب بمشرق رساند
58a/58b ظهورش چو درخانهٔ قوس بود — بر اعدای دین سهمش افتاد زود
130 درآخر بدلو اندرش عرض وطول — درآن برج آبی هبوط وافول
بتابش چو دنباله بر شرق داشت — نحوست چو عقرب براعداگماشت
خردمند دانا دل هوشمند — حکیم زمان فاضل ارجمند
بسی شب بکوشید بیخواب وخورد — که توجیه این جرم ناریه کرد
بتوفیق یزدان چو کوشش نمود — بشاهنشه احکام نبوشت زود
135 بگفتا که ای شاه عالمدار — بود شمع بزم خوشت شعله‌دار
ترا مژده بادا بفتح عجم — که درخاك شد خصم بربسته‌دم
ظهور چنین علوئ آتشی — بود اندر اینجا بفر وخوشی
ولکن بر ایران شرار بلاست — دلیل وی الفتنه من ههناست
چو توجیه خوش کرد این حکم را — زشاه جهان یافت لطف وعطا

. . . . . .

در رفع رصد گوید

140 درین دم زناگه شهنشاه دین — بفرمود بر راصدش تقی دین
144a/144b نمودند از آن اهل دانش سؤال — که ای نکته دان با شعور وکمال
چه شدکار وبار رصد بازگوی — گشادی عقد از فلك مو بموی
بگفتا بزیج الوغ بیك باز — بسی شبهه ها بود ای سرفراز
کنون شد ز ترصید تصحیح زیج — دل دشمن از غم بزد مار پیچ
145 ازین پس بفرمای رفع رصد — بر غم بد اندیش و اهل حسد

شهنشه سرچاوشانرا بخواند | زتخریب ورفع رصد قصه راند
اشارت نمودند تا قاپدان | شتابد بخیل عزب در زمان
رصد را شکافند یکباره زود | بسوی حضیضش کشند از صعود

رفتن چاوش باشی با قاپدان و رفع رصد

سرچاوشانش چو برراه گشت | ازو قاپدان نیز آگاه گشت
گروه عزب هم خبر یافتند | سوی قاپدان زود بشتافتند
سر چاوشان همره قاپدان | بخیل عزب زمرهٔ قایدان
برفتند آن هر دوتا نامور | بفرمان شاهنشه تاجور
رصد را بیك لحظه بشکافتند | فراغت زکار فلك یافتند
فکندند ذات الحلق را زبیخ | شکستند آلات وکندند میخ
نماند از رصد غیر نام ونشان | که باشد همین سان بنای جهان

نکتهٔ دلپذیر

اساسی که او را نباشد ثبات | باو کی کند اهل عقل التفات
چه دانا حکیمان چه اهل کمال | چه ارباب قال وچه اصحاب حال
ازین گنج وارژدر نبردند بهر | که اندر پی شهد خوردند زهر
بدفع اندرش هرکه تریاك خورد | زنیش اجل عاقبت جان نبرد
گر از حکمت هرمسی آگهی | کشد رشتهٔ عقل برکوتهی
ز مژگان حان ورکشی سوزنی | بآن سوزن این رشته درافکنی
چوادریس سازی خیاطت شعار | نپردازی این خرقهٔ اعتبار

در موعظهٔ طیبه

ترا عمر نوح اربود فی المثل ازین فکر یابد وجودت خلل
بد هلیز این هستی پنج روز بطول أمل چشم عبرت[4] مدوز
165 مکن حکم برکاروبار فلك که داند بجز حق مدار فلك
خود آثار علوی و انظار آن فزونست از حصر و حد بیگمان
فلاطون که استاد این کار بود بحیرت ازین گونه افکار بود
144b/145a ارسطو و بقراط وسقراط هم فرو بسته رفتند ازین فکر دم
بکندند چاه و نمودند جهد ببستند طفل خرد را بمهد
170 بجستند بر اوج عیوق راه ز روی بصیرت از آن قعر چاه
خود آگه نگشتند از کنه آن ز قعر زمین تا نهم آسمان
ترا کی شود کشف حال چنین که کردی تفنن ز روی زمین
بیا تا گریزیم ازین قال و قیل که زال جهانست محکم محیل
مبادا بهم در زند کار ما شود سرد این گرم بازار ما
175 چو کار رصد گشت پرداخته ز بنیاد ورسمش در انداخته
دعاگو شدندش همه اهل دین که فرمودکاری بشرع مبین

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[4] حیرت (؟) .

TÜRKÇE TERCÜME

YENİ ŞEHİNŞÂHÎ RASATHANENİN ALETLERİNİN TERTİPLENMESİ

Rasathane kurucusu olan bilge Astronom
Rasathaneyi öyle sağlam temeller üzerine kurdu ki,
Zamanımızda, astronominin bilgi sevenler arasındaki itibarı yükselerek
Din ilimleri gibi rağbet görmeye başladı.
Şeriat esasen sağlamdı, bilgi de çoktu;
Naklî ilimlerde yazılmış eserlerin haddi hesabı yoktu.
Asıl yaygın olan, naklî ilimler üzerindeki çalışmalardı,
Fakat aklî ilimler üzerinde de çok duruluyordu.
Çünkü, hiç şüphesiz olarak, soru sahiplerinin suallerini cevaplandırabilmek için,
Din ehlinin her ilimde bilgi sahibi olması zaruridir.
Bu durum hususiyle matematik ilimler için doğrudur;
Çünkü dirayet sahibi kimseler gerçeğin inceliklerine nüfuzda bu ilimlerden faydalanırlar.
Onun bir dalı olan aritmetik yardımiyle defterlerin ve hesapların doğru tutulması mümkün olur.
Feraiz ilmi de onunla sıhhat kazanır.
Gök cisimlerinin semadaki yerlerinin tâyini ve rasat zîclerinin hazırlanması
Bu ilim erbabı sayesinde mümkün olur.
Bu ilim yardımiyledir ki Boğa ve Koç burçlarında
Güneşle ayın yerleri kesin olarak bilinir.
Ay Akrep burcunda bulununca, böyle bir zamanda
Kıyılan nikâhın uğursuz olduğu kesin olarak bilinen bir şeydir.
Namaz vakitleri bu ilim yardımiyle tesbit olunduğu gibi,
Hicaza doğru olan Kıble istikameti de sahih olarak bu ilimle tayin edilir.
Bu ilme olan ihtiyaç bu kadar çok olduğundan
Fazıl ve hüner sahibi kimseler ona rağbet gösteriyorlardı.

Fakat buna rağmen, süflî âlemin ihmali yüzünden (yani insanların rasat faaliyeti bakımından gösterdikleri ihmalden ötürü),
Ulvî âlem tesirleri gizli kalmış durumda idi;
Uluğ Bey ile Nasîruddîn-i-Tûsî zîcleri
Yumuşak toprak üzerinde hazır izi gibi salâbetten mahrum bir vaziyette idi.
Bahtı açık kimselerin tâlihinin yeni bir zicin yapılması için sabırsızlanışı gibi,
Yıldızlar da kendilerini rasad edecek astronomlar için intizarda idi.
Derken, zamanın kırallarının efendisi ve büyüğü,
Yeryüzünün fâtihi ve ülkeler şehinşahı,
Ulusların önderi, Sultan Murad'ın yüceliği önünde,
Durum ansızın değişti.
Değirmi şekli ile yeryüzü onun dolandığı meydan,
Ay da onun topunun ve çevgânının sâdece bir aksidir.
O, Allah'ın bahşettiği bir baht ve ikbalın sahibi
Ve Zîc-i-İlhanî'nin bizzat iptal edicisidir.
Rasat yapılması ve zîc hazırlanması emrini verince,
Yıldızlar göklerden inip onun önünde yere yüz sürerler;
Onun devlet ve ikbaline dayanarak çalışmaya koyulunca,
Rasıtlar Fırkadan yıldızlarının başından tacını kapmaya muvaffak olurlar;
Onun gününde yeni zîci kim yaparsa
Rasat fikrinden kıyamete kadar vareste kalır[1].
Onun kudret ve iktidariyle her ihtiyaç karşılanmış,
Dünya cennet gibi süslenip bezenmiştir.
İşte bu mutlu ve lâtif devirde,
Bu mübarek günlerde ve şerif zamanda,
Bu ulu sultanın uğurlu devlet kapısına
Ve onun kaahir saltanatının bayındır ve şerefli çevresine
Kaahireden hünerli bir kadı geldi.
Onun matematik ilimlerindeki mahareti atalarından varasetle intikal etmişti.

[1] İslâm astronomlarının iyi bir zîc hakkındaki fikirlerini belirten bu ifade, İslâm rasathanelerinin ömrü bakımından ilgi çeker mahiyettedir.

Bu kıvrak kalemli insanın adı Takiyüddin'dir.
Hesapla ilgili ilimlerde kalem ona tamamen ram olmuş durumdadır,
Ve yazısiyle rakamları büyük bir çeviklikle sayfaları dolduruyor.
O, İbni Şatır'ı da gerilerde bırakmıştır.
Almajest'te birçok noktaları açıklamış,
Ökliddeki güçlükleri o izah etmiştir.
Bütün yeryüzünü, enişleri ve yokuşlariyle,
Pergel ve cetvel yardımiyle ve şayanı hayret işaretlerle,
Enlem ve boylam bakımından ölçmüş,
Bütün bunlarda bir tek noktada bile yanılmamıştır.
Kirpik oklariyle göz ışınlarını andıran
Bütün mevhum boyutları ve zahirî çapları dikkate almış,
Gözden gizli kalan şeylere hep nüfuz etmiş,
Mekânın bütün açılarını ölçüye vurmuştur.
Kendilerinden önce gelenlerin yüz katı kadar rasat işiyle meşgul olmuş,
Bu işi Cemşîd'den ve Şeref'ten[2] daha iyi bir şekilde başarmıştır.
O, zihninde, kuyuya baş vurmadan,
Yerden rasat yapmayı tasarlamıştı.
Çünkü akıl ve anlayış sahibi kimseler, daha önceleri,
Yerden, kuyusuz olarak, rasat yapmışlardı.
Takiyüddin de Kaahire'de bir kuyu kazdırmış,
Ona bir merdiven ilâve ettirmiş,
O kuyudan bir müddet için yıldızları sayarak
Bu işteki sebatı yüzünden haylı güçlükle karşılaşmıştı.
O böylece rasat kuyusunda didinirken,
"Beşikten mezara kadar bilgi edininiz" hadîsi gereğince yılmadan çalışmıştı.
Takiyüddin, muazzam Başvezirin huzuruna kabul edildi,
Muhammed adlı[3], zamanın o eşsiz Âsaf'ının huzuruna.
O öyle bir Âsaf ki, zamanın Ebûzercimihr'i
Onun büyüklüğü karşısında hayretten donakalmıştır.

[2] Giyasüddin Cemşid el Kâşî ve Şerefüddin Hüseyn el Âmulî.
[3] Sokullu Mehmet paşa.

Güneş onun dehasından kuvvet ve ilham almıştır;
Sanki güneş ışığını ondan alıyor ve bu kudretli varlık karşısında ay mesabesinde kalıyor.
Cihan onun tedbiri sayesinde Şaha râm,
Ülkeler onun adaleti ve icraatı sayesinde bayındır ve rahat.
Râsıdlar gök cisimleri yerlerinin zicini çıkarmayı nasıl başarıyorsa,
O da iklimlerin fethi işini öylece başarmıştır.
O isterse, Tanrı'nın yardımiyle,
Kendi mührü ile zâtülhalakla yapılan işleri yapar.
O yüksek şahsiyet her zaman için
Fazıl ve kemal sahiplerinin koruyucusudur.
Takiyüddin'in Necm Bey adlı kardeşi, arzusu veçhile,
Bu yüce başvezir tarafından sancak beyliğine getirilmişti.
Bu, Takiyüddin'e bir ümit kaynağı oldu; çünkü ilme verdiği bunca emekten faydalanmak,
Ektiği ilim tohumlarının meyvesini tatmak emelinde idi;
Ve zamanın en ileri gelen insanı olan Sadrazamın eteğini öpünce
Onun huzurundan izzet ve ikram görerek ayrıldı.
Bundan sonra da o mutlu ve ulu Hocayı,
Zamanın eşsiz insanı ünlü Sadüddin'i [4] ziyaret için yola koyuldu.
Gerekli saygı vazifesini yerine getirerek onun huzuruna çıktı
Ve elini büyüklerin âdâbına uygun olarak öptü.
Hoca da ona lûruf ve ikramda bulundu,
Tatlı sözleriyle ona hüsnü kabul gösterdi.
Hoca her türlü bilgiden bahis açtı
Ve matematik ilimleri konusuna da girdi.
Kadı yeri edeple öpünce, o da
Bilgelik hazinesinin kapısının kilidini açtı (yani konuşmaya başladı).
İlkin Hoca onunla o kadar tenkitli bir şekilde konuşmaya başladı ki,
Kadı onun derin bilgisi karşısında ağzını açmaya pek cesaret edemedi.

[4] Bk. J. H. Mordtmann, adı geçen eser; İ. H. Uzunçarşılı, *Osmanlı tarihi*, cilt. 3, Bölüm 2, Ankara 1954 , s. 457, 517.

Çünkü Hoca ilim denizlerini kapsayan bir insan,
Kalbi de ilimlerin cevher saçan hazinesidir.
Gerçekten, onun kırallara lâyık asil incilere benzeyen sözleri
Zamanın kulağına küpe olmuştur.
Kalemiyle Pleyatlardan düğüm çözmüş olan bu bilgenin
Eserleri akılların hulâsası ve özünden de kalitece üstündür.
Meydana getirdiği nesir ve nazımlar
Tarihe baş tacı olmuştur.
Onun tilmizlerinin her biri seçkin birer ilim adamı,
Ve telif bakımından, metinler ve şerhler yazmış kimselerdir.
Pitagoras onun karşısında utanç duymakta,
Arşimedes ise mecburen onun ilmi karşısında meydana çıkmayıp saklanmaktadır.
Vâkıa Hiparkos daha önceleri sistemli rasatlar yapmıştı.
Fakat bu işler bu ünlü Hocanın en küçük tilmizlerinin meşgaleleri arasında bulunuyor.
İlmi içlerine sindirmiş uyanık ve bilge kimseler,
Çeşitli gayretlerle ve yüksek ideallere uyarak
Onun ilmine kılavuzlar yardımiyle eriştiklerinde,
O ilim yardımiyle, ağır yükleri hareket ettirmek ilminin kendisini harekete getirirler.
Hoca, lûtuf ve keremle, muhteşem Kadıya
Tekrar nazarlarını atf etti.
Kendisi ile iki üç defa görüşerek
Onun sözlerini bilgelik terazisinde tarttı;
Onu çok beğendi, her bakımdan takdir etti,
Ve iftihardan başı göklere değdi.
Ünlü Hoca bu denemelerinden sonra,
Faziletli Başvezirin emir ve direktifleriyle,
Takiyüddin'in durumunu Şehinşaha anlattı,
Ve bu işi dilekçe ile değil, seçkin şahsiyle bizzat huzura çıkmak suretiyle yaptı.
Şehinşah ona zeamet verdi
Ve yaptığı ihsanlarla onun payesini yükseltti.
O da, derhal, Nasîruddin-i-Tûsî ve Ali Kuşcu gibi,
Rasat programı gereğince çalışmalarına başladı.
Padişahın şevketine dayanarak çalışmakta olduğundan,
Her işinde Allahın yardımına mazhar oldu.

Bu iş için gerekli olan şeylerden her ne istedi ise,
Hepsini isteğine uygun olarak elde etti.
Meselâ onun istediği şey göklerde olunca,
Hemen yerin altındaki balıktan Arkturus yıldızına yol açıldı.
Aradığı hazine veya maden kuyusu yerde olunca da,
Öküz altındaki Balığı karşısında buldu.
Hulâsa, lüzumlu aletler hazırlandı,
Ve bu aletler, bakır ve pirinç aksamiyle, büyük bir mükemmellikte idi.
Zâtülhalak gibi duvar kadranını da tamamladı.
Aynı suretle, yüksekliği arzuya uygun olan zâtüssemt ve'l irtifaı da yaptı.
Dördüncü aleti zâtüşşubeteyn'di,
Ve aynı suretle iki delikli rub-i-mistarı da imal etti.
Bundan başka, inaşası uğurlu bir zamana raslayan zâtülevtar da var,
Ve müşebbehe bi'l menâtık da bu aletler arasında.
Müşebbehe bi'l menâtık daha önce bilinmiyordu;
Bunu Takiyüddin Almajerst'e dayanarak ihtira etti.
Bu güzel ilimde böyle mükemmel bir aleti
Ondan önce kimse yapmamıştı.
İstenilen malzeme ve teçhizat temin edilince,
Bu iş için elverişli bir yer aradılar,
Ve Frenk Galata Sarayı semtinde
Firuze renkli bir sahayı seçtiler.
Masraf için bir kese altın verildi
Ve sarf edilen paralar bir deftere kayd olundu.
Frenk Florini, [5] sağlam binanın ana kısmını yapmak için
Kum ve topraklar gibi harcandı.
Bu muhteşem ve geometrik şekildeki yapıya
Pirinç ve bakırla renk ve parlaklık kattılar.
En başta zâtülhalakı dökünce,
Çenberini tıpkı ay gibi felek çarkından sarkıttılar.

[5] Venedik Dukasına "Frenk florini" adı da verilmekte idi (İ. H. Uzunçarşılı, *Osmanlı Devleti Teşkilatında Kapukulu Ocakları*, cilt 1, Ankara 1943, s. 466.

Bir yandan da, büyük binanın yakınında,
Muhtasar bir rasathane inşa edildi.
Burada on beş seçkin ilim adamı
Takiyüddin'in emrinde çalışmaya başladı.
Her aletle yapılacak çalışmalarda
Beş nükteli ve fâzıl astronom işbirliği yapıyordu.
İki üç râsıd, bir de dördüncü olarak kâtip,
Bunlara ilâve olarak da beşinciyi teşkil eden bir yardımcı vardı.
Bu bilgili insanlar zâtülhalak yardımiyle
Gök cisimlerinin enlem ve boylam bakımından yerlerini hep tâyin ettiler.
Duvar kadranı ile de güneşin eğimi bulundu.
Ekuvatörden olan başka mesafeler de tâyin edildi. [6]
Zâtüssemt ve'l irtifâ aleti yardımiyle de, râsıtlar,
Birbirleri ile işbirliği yaparak, yükseklik açılarını tâyin ettiler.
Venüs'le Merkür'ün hareketlerinde
Gün görmüş felek çarkının dolanmalariyle beliren güçlüklerin incelenmesi,
Ve ayrıca, yükseklik açılarıyle zenit mesafelerinin tesbiti
Rub-i-mistar yardımı ile başarılı bir şekilde yapıldı.
Astronomlar zâtüşşubeteynle, ve yine aynı suretle,
Zâtüssukbeteyn'le bir çok ölçüler aldılar:
Bunlardan birincisi ile bütün yükseklik açılarını sıra ile tesbit ettiler;
Ayın paralaksını da aynı suretle bu aletle buldular.
İkinci alete gelince, bununla da gök cisimlerinin boyutlarını ve mesafelerini bularak
Bunları yerli yerine kaydettiler.
Zâtülevtâr'ın rolü de hiç küçümsenmesin;
Çünkü bununla ekinoks noktaları sahih olarak tâyin olundu.
Müşebbehe bi'l menâtık'la da, büyük bir uyanıklıkla
Yapılan rasatlardan, şüphe götürmez bir şekilde,
Üçüncü felekte Venüs'ün episiklinin
Yarı çapı tamı tamamına meydana çıkarıldı.

[6] Yukarıda s. 11 ve not 39'a bakınız.

Saatla alınan dakik ölçüler ve yapılan tashihler yardımiyle
Yıldızların matla'ları [7] ortaya kondu.
Bu ilimde "senidî" adıyle anılan ve harikulâde bir alet olan
Sağlam ve hususî olarak seçilmiş mistarla da,
Aletlerdeki işaretlerle rumuzların dakikliği
Son derece arttırıldı.
Gerek ilk önemde ve gerekse geri plândaki bütün hazırlıklariyle,
Takiyüddin, rasatlarına dokuz yüz seksen beş yılında başladı.
Tanrı bu işin tamamlanmasını, Sultan Murad'ın
Yüce koruyuculuğu altında müyesser etsin.
Ey sâki, cana can katan şarabı sun
Ve kâinatın aynası olan kadehin ününü gölgele ki
Yepyeni bir neş'e ve canlılığa kavuşalım
Ve Pleyatlardan düğümler çözelim.

DESTANIN MATLAI

Feleğin göz bebeği olan yıldızların yaratıcısı,
Güneşle ayın gözden kaybolup gizlenmesinin
Ve şimşek ve yıldırım hamlelerinin öz kaynağı ve faili,
Yıldızların mutluluk ve talihsizliğe delâlet eden vaziyetlerinin düzenleyicisi,
Ayı safhalarının sonuncusuna ve ilkine eriştiren,
Yanıp tutuşmaya karşı dünyayı koruyan,
Tutulma zulmetinden güneşi kurtaran,
Husuftan sonra aya parlaklığını geri veren,
Evcde ve hazizde resden ve zenebden,
Yorgunluk bilmeden, düğümler çözen ulu Tanrı
Kudretini öylesine izhar etmiştir ki
Her şeyi yapabildiğini eserleriyle göstermiştir.
Bazan karanlıktan aydınlığı zuhura getirmiş,
Bazan da güneşi zulmetin içinden çıkarıp nurlandırmıştır.
Gündüzün arkasından geceyi getirmiş,
Bu suretle ışıklı gün de gecenin peşine takılma durumuna girmiştir.

[7] Matla'ın mânası için bakınız: E. Wiedemann, *Zur Astronomie bei den Arabern, Beiträge, IX, Sitzungsber.....*, 1906, cilt 38, s. 192-193.

Geceleri gezegenlerin parıltılarını arttırmış,
Nurlu güneşin parlaklığı ile de gündüze ihtişam vermiştir.
Yedi gezegenle sayısız sabit yıldızları
Sınırsız derecede bilgeliğe delâlet ettirmiş,
Bu yıldızların her birinin etkisiyle de,
Hayrete şayan türlü olaylar meydana getirmiştir.
Ayrıca, yıldızların ilminden, akıllı insanlara,
İyi ve kötü hakkında birçok ipuçları vermiştir.

ATEŞ TABİATLI BİR GÖK CİSMİNİN BELİRMESİ HAKKINDA

Bütün bunlardan daha hayret uyandırıcı bir olay,
Buğunun yanmasından ve sıcak tabiatlı ulvî belirtilerden meydana gelip
"Yedi meşum nesne" [8] olarak tanınan kuvvetli bir alevin,
Kuyruklu yıldız adı verilen hınç almada amansız gökcisimlerinden birinin,
Ramazan ayının ilk gecesinde, ansızın,
Fakat gayet sarih olarak parlamaya başlaması olmuştur.
Bu muvakkat dünyanın dokuz bölgesinden geçerek bu kuyruklu yıldız,
Hicretin dokuz yüz seksen beşinci yılında,
Firkadan yıldızlarının üst tarafında, ışıktan bir kuşağı andıran şekliyle,
Birçok geceler yükseklerde bir güneş gibi süzüldü.
Müslümanların gecesi onunla mutlu oldu
Ve ışığı ortalığı dolun ay gibi aydınlattı.
Feleğin evcinde kırk gün kalarak
Doğudan batıya bir ışık şeraresi gönderdi.
Zuhuru Yay Burcuna rasladığından
Din düşmanları üzerine okunu hızla fırlattı.
Sonunda ise enlem ve boylamı Su Burcuna isabet etti;
Batışı ve kayboluşu bu rütubetli burca rasladı.
Kuyruğu doğuya uzandığından
Nuhusetini, akreb gibi, düşman üzerine saldı.

[8] Bu tâbirin manâsı anlaşılmamıştır.

Zamanın bilgesi, fazıl sahibi âlim,
Akıllı veuyanık bilgin Takiyüddin,
Bir çok geceyi aç ve uykusuz geçirerek,
Bu alevli cisim üzerinde incelemeler yaptı.
O bu çlışmalarında Allahın hidayetine mazhar olduğundan
İlgili ahkâmı Şehinşah için çabukça çıkarabildi.
Ona dedi ki, ey dünyanın medarı olan padişah,
Senin güzel bezminin mumu ışıklı olacak;
Sana Acem Diyarının fethi müjdesi var.
Düşman ise, nefesi kesilmiş bir vaziyette yere serilmiştir.
Böyle ulvî bir ateşin zuhuru
Burası için iyi ve uğurlu şeylere delâlet ediyor.
Fakat İran için bir belâ şeraresi;
Onun kılavuzu "Fitne oradan gelecek" hadîsidir. [9]
Takiyüddin böyle güzel ahkâm çıkardığı için
Cihan şahından lûtuf ve ihsan gördü.

. . . . . .

RASATHANENİN SONA ERDİRİLMESİ HAKKINDA İRADE

Bu sırada, dinin koruyucusu olan Şehinşah, ansızın,
Rasıdı Takiyüddin'e şöyle buyurdu;
"Bilge kimseler merak edip soruyorlar;
Ey nükteli, şuurlu ve olgun insan,
Rasat işi ve sonuçları ne âlemde, anlat bakalım.
Felekten kılı kırk yararcasına düğümler çözdünmü?"
Takiyüddin şöyle cevap verdi: "Ey ulu önder,
Uluğ Bey Zicinde pek çok şüpheli yerler vardı,
Şimdi artık rasatlar yardımiyle zîc tashih edilmiş bulunuyor.
Düşman ise pek kederli, can evinden kıvrım kıvrım kıvranıyor.
Artık rasadın sona erdirilmesi emrini ver;
Kötü düşünceli ve kıskanç kimselere nisbet olsun."
Şehinşah Çavuşbaşıyı çağırttı
Ve Rasathanenin yıktırılarak ortadan kaldırılmasını emretti.
Kaptanın o anda Azap Tayfasına gidip
Gerekli tertibatı alması,

[9] *Sahîh el Bukharî*, Bulak 1313 H. , cilt 7. s. 51.

Ve rasathanenin derhal yıktırılarak
Evcinden hazizine indirilmesi için de talimat verildi.

ÇAVUŞBAŞI İLE KAPTANIN BİRLİKTE RASATHANEYE GİTMELERİ VE RASATHANENİN YIKILMASI

Bir taraftan Çavuşbaşı yola çıkarken
Diğer taraftan emir Kaptanın da kulağına gitti.
Azap tayfasına da haber ulaştı,
Ve bunlar hemen Kaptanın yanına koştular.
Çavuşbaşı Kaptanla birlikte gidiyor,
Azap tayfasının başındaki komutanlar da bunlara refakat ediyordu.

Bu iki ünlü önder, yüce Şehinşahın
Buyruğiyle harekete geçmişlerdi.
Rasathane bir anda al-aşağı edildi
Ve rasat işine böylece son verildi.
Zatülhalakı kökünden kazıdılar;
Aletleri kırdılar ve çivileri söktöler.
Rasathanenin adından ve sanından gayrı bir şey kalmadı.
Nitekim dünyamızın âkibeti de böyle olacak.

GÖNÜL FERAHLATICI BİR İYKAZ

İstikrarı ve bakaası olmayan şeye
Akıl sahibi kimseler nasıl olur da iltifat ederler?
Ne hakîm bilginler, ne de faziletli ve olgun kimseler,
Ne dünya adamları, ve ne de nefiselerini derunî hayata ve tefekküre hasr edenler,
Muvakkat dünya zevklerinden nasiplenmeye ve bunların başında bekleyen ejderin elinden bir şey koparmaya muvaffak olamamışlar,
Balın peşi sıra zehir içmişlerdir.
Bu durumda tiryaka baş vuranlar da
Sonunda ecelin pençesinden canlarını kurtaramamışlardır.
Hermes bilgeliğine sahip isen
Aklının şirazesi bu muamma karşısında aczini idrak eder.

Basiret gözünden bir kirpik yolsan,
Bunu iğne yapıp ona akıl ipliğini geçirsen,
İdris Peygamber gibi de terziliği kendine şiar edinsen,
Yine bu itibar hırkasını tamamlayıp meydana getiremezsin.

GÜZEL BİR ÖĞÜT

Nuh'unki gibi uzun bir ömrün de olsa,
Bu gibi fikirler varlığına sarsıntı getirirdi.
Bu beş günlük dünyanın karanlık geçidinde
Aşırı ihtirasla ibret gözünün körleşmesine meydan verme.
Feleğin esrarı hakkında ahkâm çıkarma.
Kâinatın gidişini Allahtan başka kim bilebilir?
Ulvî âlemin tesirleri ile onun belirtileri
Şüphesiz sayılıp dökülemiyecek kadar çoktur.
Bu işin üstadı olan Eflâtun
Bu gibi düşünceler karşısında şaşırmış durumda idi.
Aristo ile Hipokrates ve Sokrat da,
Bu düşüncelerinden hiçbir semere almadan son nefeslerini verdiler.
Kuyu kazarak uğraşıp didindiler
Ve akıl yavrucağını gelişsin diye beşiğe koyup üzerine titrediler.
Basiretleri dolayısiyle, feleklerin evcine giden yolu
Kuyunun dibine inmek suretiyle aradılar.
Onlar bile yerin derinliklerinden dokuzuncu feleğe
Kadar uzanan muammanın künhüne varamadılar.
Onlar yapamadıktan sonra, bu esrarı çözmek sana mı kaldı ki
Yer yüzünü bırakıp da feleklerin ilmine varmaya yeltenıyorsun.
Gel bu safsatadan kendimizi sıyıralım;
Çünkü dünya denen o acûze müthiş bir düzenbazdır.
Bizim işlerimizi bir karıştırıverirse
Samimî ve sıcak cemiyetimize bir soğukluk ârız olur.
Rasathane meselesi kapanıp
Esasından ve izinden de eser kalmaynca,
Şeriata uygun olan bu buyuruğundan dolayı
Bütün din ehilleri Padişaha dualar ettiler.

ENGLISH TRANSLATION

CONCERNING THE PREPARATION OF THE INSTRUMENTS OF THE ROYAL OBSERVATORY

Our wise star-gazing Astronomer
Has placed the Observatory on such firm foundations
That in this era, among lovers of knowledge, the prestige enjoyed by astronomy
Has become comparable to that of the sciences of religion.
In earlier days jurisprudence had a firm position and learning was well-spread,
And countless books were written on revealed knowledge,
But although people were working chiefly on theological subjects,
Much work was also done on the rational sciences.
For clearly, in order to answer the queries of people,
The cultivation of all the sciences is indispensable to the theologians.
This is especially true of Mathematics.
For wise people grasp the subtleties of knowledge through the help of this department of science.
Accounting depends on its branch called arithmetic,
And the science of inheritance gains precision through it.
The determination of planetary positions, as well as the construction of astronomical tables,
Is made by those well-versed in that science.
It is through this science that one comes to know with certainty
The mansions of the sun and the moon in the signs of Taurus and Aries
— And if the moon is found to be in the sign of Scorpio,
Marriage must certainly be avoided at such a time—
The times of prayer are determined with the help of this science,
And the exactness of the direction of *qibla*, toward Ḥijâz, becomes possible by it.
As its utility is so extensive,
People of virtue and discernment all valued it highly.

However, due to the neglect shown in the inferior and earthly section (i.e., by human beings),
The influences of the lofty spheres had remained hidden.
The astronomical tables of Ulugh Bey and Naṣîr al Dîn al Ṭûsî
Had become worn-out like traces of mats upon soft soil.
The heavenly bodies were impatiently waiting for the observers,
Just as the ascendents of persons of good fortune awaited the new astronomical tables.
Then suddenly, with the splendor of the sovereign of the earth,
The master of the rulers of the time,
The highly placed and world-conquering Emperor,
The Shahinshâh of the climes, Sultan Murad, things changed completely.
The surface of the earth, with its wheel-like shape, is the roving-ground of this potentate,
And the moon is a mere reflection of his ball and polo stick.
He is the possessor of a God-given felicity and good fortune,
And is the one who has caused the abandonment of the Ilkhânî Tables.
When he issues orders for making observations and compiling astronomical tables,
The stars will descend and prostrate themselves before him,
And when, in their endeavors, the astronomers are backed up by his sovereign power,
They will carry off the crown from the stars of the Ursa Minor.
Whosoever compiles the new tables during his reign
Will become freed from observation programs till doomsday. [1]
With his magnificent power all kinds of needs have readily been met
And the earth has been adorned like paradise.
In this delightful era and pleasant age,
On a fortunate day and at an auspicious time,

[1] This statement, which indicates the conception of the astronomers of Islam of good astronomical tables, is of interest with respect to the life of Islamic observatories.

To his sublime threshold, to his imperial capital,
To the felicity of the seat of his victorious government,
Came from Cairo a Qâḍî of high merits.
His proficiency in Mathematics went back to his forefathers.
This man handles the pen with extreme swiftness and his name is Taqî al Dîn.
In the art of calculation the pen is servile and compliant in his hand.
With alacrity he fills the pages with numerals and figures.
He has surpassed Ibn Shâṭir and has taken his pre-eminence away from him.
In the Almagest he has clarified many intricate parts,
And in Euclid's Elements he has disentangled many difficult points.
With the help of compasses and rulers and through strange figures,
He has completely measured the latitudes and longitudes
Of all parts of the earth with its varying altitudes,
And he has not, in all this, made the least flaw.
Taking into consideration all the apparent diameters and dimensions,
Which resemble the dart-like eye-lashes and the visual rays,
He has penetrated all the things which are concealed from sight
And has taken the measurements of all the angles of space.
He has observed a hundred times more than his predecessors,
And his observations have surpassed in quality those of Jamshîd and Sharaf. [2]
Taqî al Dîn had come to the decision that he would make
Observations from the ground and not from a well.
For people of good judgment and sagacity of bygone times
Had made their observations without recourse to wells.
Taqî al Dîn himself had prepared a well in Cairo
And had had it equipped with a scaling-ladder.

[2] Giyâth al Dîn Jamshîd al Kâshî and Sharaf al Dîn Ḥusayn al Âmulî.

For some time he had counted stars from that well,
And due to his perseverance he had gone through much hardship.
While thus struggling in the observation well, he was acting
In accordance with the Tradition recommending the quest of knowledge from cradle to grave.

40. Taqî al Dîn paid a visit to His Excellency, the formidable Grand Vizier,
Who is the unequalled Âṣaf of our time and whose name is Muḥammad.[3]
What an Âṣaf! The Abûzarjimihr of the time
Has, out of astonishment, become tongue-tight in his presence.
The sun has received glamor from his excellence;
It is as if that luminary is a mere moon in the presence of his splendor.
Thanks to his skilful policy the world is submissive to the King,
And the lands are prosperous because of his judicious administration.
He has achieved the conquest of the climes with the same promptness and precision
With which astronomers establish the tables of planetary positions.

45. Should he so desire, he would perform with his seal
The things that are done with the armillary sphere.
His exalted personality is incessantly eager
To protect the people of virtue and perfection.
Through him, Taqî al Dîn's brother, whose name is Najm,
Had become the governor of a *sanjaq* district.
Taqî al Dîn too had entertained hopes
Of reaping a harvest from the seeds of knowledge which he had sown.
And when he kissed the skirt of the Grand Vizier's garment,
He was given a kind and courteous farewell [after his audience with him].

[3] Sokullu Muḥammad Pâshâ.

He set about to go to visit the glorious Khwâja,
The most accomplished person of the age, the illustrious Sa'd al Dîn. [4]
He entered his home with appropriate greetings
And kissed his hand in the manner befitting eminent personages.
The Khwâja too treated him with attention and ceremony
And showed kindness to him with tender and gracious words.
He conversed on all kinds of knowledge
And also spoke on the mathematical sciences:
When the Qâḍî kissed the floor with courtesy
The Khwâja unlocked the door of his treasurehouse of wisdom.
The Khwâja was at first so critical of his guest's words
That the Qâḍî did not dare to speak much.
For verily the Khwâja encompasses the seas of learning
And his heart is a chest bringing forth and strewing gems of knowledge.
His words, which are like pearls befitting a king,
Have become guiding watchwords for all time.
With his pen he has untied knots from the Pleiades,
His publications surpass in excellence the essence and epitome of the intellects.
With the prose and poetry which he has produced
He has fashioned a crown upon the head of history.
Each and every one of his disciples are master scientists,
From the standpoint of publications, they are authors of commentaries and independent works.
In the face of his superior attainments, Pythagoras is ashamed of his shortcomings,
And Archimedes has inevitably gone into hiding.
It is true that Hipparchos has made extensive observations in bygone days,
But this constitutes the type of work done by the least of our Khwâja's disciples.

[4] See Turkish translation, note 4.

When people of sagacity and wisdom who have been thoroughly immersed in knowledge,
Through extensive efforts and moved by lofty ideals,
Gain access to his science with the aid of guides,
They will, with its help, lift even the science of lifting heavy loads
Once again, with courtesy and kindness, the Khwâja
Directed his views upon the lofty Qâḍî.
He interviewd him two or three times
And weighed his utterences with his balance of wisdom.
He admired him and was well pleased with everything,
Out of pride in the Qâḍî his head touched the sky.
After all his scrutiny, the illustrious Khwâja,
With the permission and instructions of the virtuous and excellent Grand Vizier,
Presented the case of Taqî al Dîn to the Shahinshâh,
Not by submitting a petition but by obtaining an audiance for his own gracious self.
The Sultan granted Taqî al Dîn an estate,
And through benevolent actions increased his dignity.
Taqî al Dîn, in turn, in the manner of Naṣîr al Dîn and 'Alî Qushjî,
Immediately set in motion the matter of building the Observatory (or, of making observations).
As he set about to do this on the supreme royal authority,
God's aid and support were with him in all his undertakings.
Whatever he wished to have in the way of technical equipment
Was produced with great promptness and ease.
If the object sought by him was in the heavens,
He immediately found his way from the Fish beneath the earth to Arcturus,
And in case he stood in need of subterranean treasures and mines,
The Fish would immediately make its appearance from underneath the Cow (which supports the earth).

In short, the required instruments all became ready.
They were, with their brass and copper sections, of great perfection.
Taqî al Dîn completed the armillary sphere as well as the mural quadrant,
And likewise, the instrument for measuring azimuths and altitudes which was of large dimensions.
The fourth instrument is the parallactic rule,
And there is also the ruler-quadrant with two holes,
And the corded instrument whose construction was happily timed.
The *mushabbaha bi'l manâtiq* too figured among this array of observational instruments.
The latter instrument was non-existent before our day,
Taqî al Dîn invented it, deriving it from the Almagest.
No one else had previously made such a beautiful design
In this wonderful branch of science.
When all the needed equipment and materials became ready,
A convenient place was sought as the site of the Observatory.
In the Frankish Galata Saray district
They chose a turqoise field for this purpose.
A purse of gold was set aside for the undertaking
And all expenditures were registered in a book.
Venetian Ducats[5] were spent like sand
For the construction of the main part of the sturdy building.
And to that sumptuous geometrical structure
Much luster was added through brass and copper.
When, first in order, the armillary sphere was cast,
They suspended its ring, like the moon from the vault of the heavens.
And they also built a small-scale observatory
In the vicinity of the main building.
In it fifteen distinguished men of science
Were in readiness in the service of Taqî al Dîn.

[5] The "Frankish Florine" of the text apparently refers to Venetian Ducats İ. H. Uzunçarşılı, *Osmanlı Devleti Teşkilâtında Kapukulu Ocakları*, vol. 1, Ankara 1943, p. (466.).

In the observations made with each instrument
Five wise and witty men of science cooperated :
There were two or three observers, and the fourth was the clerk,
And there was also a fifth person who performed miscellaneous work.
People of discernment found out with the help of the armillary sphere
All the positions of stellar bodies in latitude and longitude.
With the mural quadrant the declination of the sun was ascertained,
And other distances from the equator were also determined. [6]
With the help of the instrument for measuring azimuths and altitudes,
Angles of elevation were recorded by astronomers who worked together.
The intricate and complex aspects of the motions of Mercury and Venus,
Which are caused by the revolution of the aged ecliptic,
As well as the angles of elevation and the zenith distances
Were checked and confirmed with the ruler-quadrant.
They also took measurements
With the parallactic rule and the diopter;
With the former all angles of elevation
And also the parallax of the moon were determined,
And as to the latter, by the help of this instument
The dimensions and distances of the stellar bodies were recorded in an orderly manner.
The corded instrument was by no means in the background either,
For with its help the points of the equinoxes were correctly determined.
Moreover, with the help of the *mushabbaha*,
And thanks to very carefully made observations,
The radius of Venus' epicycle, in the third firmament,
Became known with great precision.

[6] See above, p. 29 and note 39.

And with the help of careful measurements and corrections made with the clock,
The ascensions[7] of the stellar bodies were fixed.
With the firm and specially chosen ruler,
That wonderful ruler to which the astronomers give the name "sanîdî",
All the symbols and signs of astronomical instruments
Became extremely accurate.
Taqî al Dîn started full-scale observations in the year 985,
With all necessary preparations of major and minor importance.
And may God bring it to cmpletion
With the magnificent authority of Sultan Murad.
Serve, then, the life-giving wine, oh cup-bearer,
And eclipse the glory of the world-revealing cup,
So that we may enjoy a fresh and new exuberance
And untangle knots from the Pleiades.

INTRODUCTION

The creator of the luminous gems of the firmament,
The concealer of the sun and the moon,
The exhibitor of the impetuosity of the lightning and thunderbolt,
The creator of the dispositions of stars indicating good fortune and ill omen,
The carrier of the moon to its initial phase and to the last lunation,
The rescuer of the world from the danger of ignition,
The reliever of the solar body from its eclipse,
The reviver of the lunar luster after each obscuration,
The untiring unraveller of knots
From the nodes in apogees and perigees
Has revealed his power to such an extent
That he has exhibited his creative ability in every direction.
He has at times brought forth light out of the darkness,
And on other occasions he has caused the sun to emerge out of obscurity.

[7] For the meaning of *maṭla'*, see, E. Wiedemann, *Zur Astronomie bei den Arabern, Beiträge , IX, Sitzungsberichte ...*, 1906, vol. 38, p. 192-193.

He has made the night-time follow the day,
And thus the bright day, in its turn, has become a trailer of the night.
During the night-time he has increased the brilliancy of the planets,
And has enhanced the glory of the day with the glowing sun.
He has caused the seven planets and the countless fixed stars
To embody and reveal boundless wisdom.
And with the influences of each one of the stellar beings
He has brought into existence many wonderful things.
Likewise, he has created many situations indicating,
To intelligent people, good and ill omen, through the science of the stars.

CONCERNING THE APPEARANCE OF A FIERY STELLAR BODY

A still more remarkable thing is that, through the ignition of vapor,
And as an occurrence pertaining to the fiery phenomena of the high regions,
A strong flame referred to as the "seven sinister things",[8]
One of those stellar bodies of quick vengeance, called comet,
Suddenly appeared, on the first night of Ramaḍân,
And shone with a strong and clear light.
Passing through the nine sections of the ephemeral world
In the year 985 of Hegira,
Like a turban sash over the Ursa Minor stars,
It soared like the sun for many nights.
Through it the night of the Moslems became blessed,
And its light was world-pervading like that of the full-moon.
In the apogee of the firmament it remained for forty days,
And sent a gush of light from the east to the west.
As its appearance was in the house of Sagittarius,
Its arrow promptly fell upon the enemies of the Religion.

[8] I have not been able to establish the meaning of this expression.

At the end its longitude and latitude were in Aquarius
And its descent and disappearance coincided with that watery sign.
As its tail extended in the direction of the east,
It discharged its inauspiciousness like a scorpion upon the enemies.
The wise and sagacious man of learning, Taqî al Dîn,
The virtuous and illustrious man of wisdom,
Worked for many nights without food and rest
To determine the implications of the appearance of this fiery body.
As he was helped by God in his endeavors,
He quickly wrote the astrological indications and presented them to the Shahinshâh.
He said, "Oh world-swaying King!
The candle of your pleasant society shall be resplendent.
There are joyful tidings for you concerning the conquest of Persia,
For the foe is lying, with failing breath, on the ground.
The appearance of such a sublime flame
Is for this realm an indication of well-being and splendor,
But for Persia it is a bolt of misfortune,
And its guide is the Tradition that "wickedness is from over there" (i.e., from the East).[9]
As he had made a pleasing forecast for the occasion,
He received kindness and benefits from the King of the World.

. . . . . .

DECREE CONCERNING THE ABOLISHMENT OF THE OBSERVATORY

At this time, all of a sudden, the Potentate who is the defender of the Religion
Spoke thus to his astronomer, Taqî al Dîn :
"People of learning have made inquiries concerning this :
Oh you witty man of conscientiousness and perfection,

[9] See Turkish translation, note 9.

Inform me once more on the progress and the results of observations.
Have you untangled knots from the firmament in a hair-splitting manner?"
Taqî al Dîn answered, "In the Zîj of Ulugh Bey
There were many doubtful points, oh exalted King;
Now through observations the tables have been corrected,
And out of grief the heart of the foe has writhed and twisted into coils.
From now on, order the abolishment of the Observatory,
To the consternation of the ill-wishers and the jeaolous."
The King of Kings summoned the Head of the Halberdiers of his body guard
And gave him instructions concerning the demolition and the abolishment of the Observatory.
Orders were given that the Admiral
Should immediately rush to the Marine Ordnance Division
And that they should at once wreck the Observatory,
And pull it down from its apogee to the perigee.

THE DEPARTURE OF THE HEAD OF THE HALBERDIERS AND THE ADMIRAL FOR THE OBSERVATORY, AND ITS ABOLISHMENT

As the Head of the Halberdiers set out to go to the Observatory.
The news reached the Admiral also.
The Marine Ordnance Division too received the orders
And made haste and quickly joined the Admiral.
The Head of the Halberdiers was accompanying the Admiral,
And with them were the leaders of the Marine Ordnance Division;
Both these renowned persons had presented themselves on the scene
Upon the orders of the exalted Sovereign.
They pulled the Observatory up by the roots
And made subside all the work concerning the firmament.
The armillary sphere was uprooted from its foundation,
And the instruments were broken and the nails were pulled out.

Nothing remained of the Observatory but name and memory;
And verily, the fate of the world itself shall be a similar one.

AN ELEGANT REMARK

When a thing is of no permanence and is devoid of stability
How can people of sagacity be favorably disposed toward it?
Savants of wisdom, and people of virtue and perfection,
Men of the world, and those of holy and contemplative life, all alike,
Have passed away without having derived anything from the treasures of this world and their guarding-dragon (the ephemeral world).
In fact, they have tasted poison after having had honey.
And he who resorted to antidotes was likewise unable
To save his life from the sting of the predestined time of death.
If you come to possess the Hermetic wisdom,
Your thread of intellect will declare itself insufficient to cope with the mystery of life.
If you pluck a needle-like lash from your inner eye
And thread that needle with the fibre-like intellect
Then, like the Prophet Idrîs, dedicate yourself to the art of sewing,
You still shall not be able to prepare and complete the gown of esteem and influence.

A BIT OF GOOD ADVICE

If you were favored with a life comparable in length to that of Noah,
Still your being would suffer from preoccupations of this kind.
In the labyrinth of this existence of short duration
Do not close your eye of circumspection out of greediness and appetite.
Do not make decisions concerning the affairs of the firmament.
For who, beside God, knows the gait and the revolution of the heavens?
The influences of the higher spheres and their appearances
Are, without any doubt, innumerable.

Plato who was the master of these arts
Was bewildered in the face of such thoughts.
Aristotle, Hippocrates, and Socrates too,
Departed from this world while still guarding silence in these matters.
They dug wells and spent much effort,
They wrapped up the infant-intellect in the cradle (giving it the best care so that it should grow up);
Out of discernment and sagacity, they sought to attain
To the culmination of Capella, by descending to the bottom of the well.
They were unable, however, to penetrate that mystery
Which extends from the inner depths of the earth to the ninth sphere.
What hope then can you have of uncovering all these matters,
That you make diversions from the surface of the earth and indulge in celestial affairs.
Come, let us get away from this egotism and wrangling;
For the old decrepit world is monstrously tricky and deceptive.
Beware of her, for she may put our affairs into confusion,
And this warm gathering of ours may become chilly and cold.
When the affair concerning the Observatory was brought to completion,
And it was torn from its foundation and its traces were obliterated,
All people of faith prayed for the mighty King;
For he had caused the performance a deed which was in accordance with the Law of the True Religion.