

Protection of Historical Heritage From The Point Of Sustainable Environment and The Sample of Caca Bey Madrasa In Kırşehir District

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1 ABSTRACT

Caca Bey Madrasa in the heart of the city Kırşehir madrasa was situated in the central Anatolia region. That madrasa was built by Turkish scientists from West Turkistan. Caca Bey founded the science center. Built as a madrasa was used as an observatory the building, which has undergone several renovations. Observations were accured in the years 1271-1272 by the house (observatory), but now serves as a mosque. It was known Cıncıklı mosque among the people with the name because of the blue tiles covered. The madrasa built of cut stone was square in shape and was the type of madrasa-domed structure. Caca Bey Madrasa was separated mainly two parts, one was Caca Bey Complex and the other was Caca Bey Tomb. An artful madrasa in Seljuk period was built and decorated with mosaic tiles and with stone portal, with brick and was a high observation tower. This tower was taken back later the minaret of bonds. Caca Bey Tomb, north-east corner of the school building of the madrasa has seven (7) digit stairs. Kırşehir was in the first degree earthquake zone in terms of the potential for producing earthquakes. Kırşehir was formed in first geological time, and was known as "Kırşehir Massif" in the earthquake literature. Movement Speed of Kırşehir fault line was 2 mm in a year. Depending on the strike-slip faults generally occur the earthquakes in this area. This madrasa must be renovated and strengthened bounding original characteristics of madrasa including the earthquake circumstances in that area.

Keywords: Caca Bey Madrasa, Kırşehir, earthquake

2 INTRODUCTION

It is known that Kırşehir have been taken from Byzantines by Turks during the arrival of the Oguz Turks to the Anatolia of the years of 1050. However, the dates of the works of art in the city belong to the period subsequent two hundred years after Turks invaded it [1]. These monument structures have been earned, after the period of Genghis Khan; during Mongols have earned victory (1244) against Anatolian Seljuks by the descendants of Genghis Khan [2]. There is especially a monument among them which attracts the most attention, which is the Caca Bey Madrasa becoming the symbol of the city today. Caca Bey Madrasa and Mausoleum were built during Gıyasüddin Keyhüsrev (Gıyasüddin Keyhüsreb ibni Kılıç Arslan) son of Kılıç Arslan by the Caca bey governor of Kırşehir or his son Nureddin Cibril (Nureddin Cibril ibni Caca) in Kırşehir in 1272 (Hijri 671) [3]. The structure was repaired in 1871 [4]. It is known that it has been restored recently without loss of fidelity [5].

There are a number of striking special and common motifs used in the buildings of Seljuk on the outside of the building used currently as mosque (Figure 1). When the front part of the structure is divided into three; there are the main tomb on the left side, crown door in the middle and flat wall without window on the right side. Also, there is tower now used as minaret in the South west corner of the building. There is not a strong evidence, but still it is claimed by the public that it is a observation tower. This tower as minaret takes attention because its position is opposite to the structure (Figure 2). It is still a question why this structure has been built. There is a possible observation wells inside it and right under half-open dome over which was closed later by glass [6]. Today, it is still unknown that what kind of an observation system is used in it and how the possible observation well's inside is organised. In addition, there are two marble columns on both sides; right and left hand, a few meters behind the altar when the structure is entered inside. It is noticed at the first glance that the altar was built later. It is known that the origins of astrophysics and spectroscopy

goes back to several centuries and even goes back to ancient times [7]. There are a few rooms opening to the mid-gap including daylight observation well on the day. There are also doors on the second floor of the structure. In this study, it is aimed to draw attention that repair and strengthening of Caca bey Madrassa in terms of the preservation of sustainable environment and historical heritage will be done according to the conditions of earthquake risk of the region in order to make its life time longer is required.



Figure 1: Kirşehir Cacabey Madrassa

2.1 ARCHITECTURAL FEATURES OF THE CACA BEY MADRASSA

The area of the entrance door is portal and was made of two colour Stone. It is interesting the curved corner columns placed on the outer corners. There are three towers, whose western side near wall, lower sides in the shape if missile in various embroidered, upper part conical, in the corners of North-east and North-west, on the west corners each of them has only one. It is likely that these towers are the model of the missiles, currently being used, which were used in the wars by Muslim Seljuk Turks 700 years ago, (Figure 2), [8].

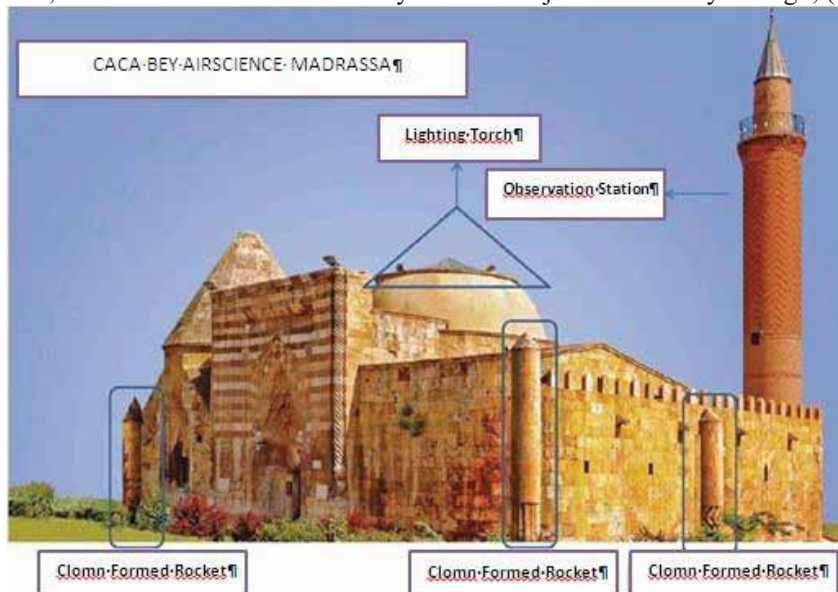


Figure 2: The view of the model of Caca Bey Madrassa with missiles on its right and left side.

It is passed from the portal door to the barrel-vaulted entrance iwan not on the middle axis, from there to the main space. The main space is covered with a dome having round opening. Later, glazing was used to close over the dome. There is the main iwan used as a prayer room in the South of it. Also, the iwan has a niche. There are a shrine to the left of the main space, a side iwan and a madrassa room; to the right side are there rooms with student's dormitories back the porches. There is a shrine to the left side of the main space, side-

iwan and one madrassa room; also, it is passed to the cell with stairs leading to the domes from little door to the right side. It is climbed to the second floor with this stair [8].

Upper floor is consisted of two little spaces on the barrel-vaulted corridor. There are totally eight rooms in smaller panes; four in the right side of the main space and four on the left side. Three of them are too long and the rest detached planned close square. Tops of them are pointed vault. The arches of this building are Turkish arches with two-canted. The outer of the doors are pictured by profile-based arches. There is a mosque like cell overlooking the square with open dome on the upper floor of Madrassa and a second room with fireplace near it. It is climbed to here by the help of the straits near the main door. The dome was made of weak Stones and the tops of them are plastered. The vaults were machined internally with cut-stones. Windows enter a perpendicular slot for rooms to take sun light. Thicker walls do not pose any hinder and light is spread within the cell abundantly [8].

2.2 Tower Madrasah

A madrassa built in Seljuk period has a Stone artistic portal, brick, a high observation tower decorated with mosaic tiles. Later, this tower has been converted into minaret. The high observation tower before turned into minaret was covered with a dome in the shape of cubes. Public named it as "CINCIKLI" because of flaring fruze (fruze is a Turkish word) tiles of the high observation tower (minaret) [8].

2.3 Cacabey Tomb

Cacabey tomb is in the North-east corner of the Madrassa. Seven (8) digit stairs are used inside the adrassa. Decorations within the tile were made of black, blue, white colours. There is an inscription written in Seljuk essay writing above inside it. There are ion columns under the muqarnas in the windows section of the dome and pointed cone in polygonal pyramid shaped with inner dome over it. Geometric reliefs on the right and left also are the most interesting parts [8].

3 SEISMICITY

Kırşehir and its vicinity are located in the first degree earthquake zone in terms of potential of producing earthquake. That Kırşehir formed over geological time is known as "Kırşehir Massif" in the Literature. Moving speed of the fault line and plate including Kırşehir is 2 millimetres (Figure 3). Earthquakes happen generally depending upon strike-slip faults in this region. 129 earthquakes happened between (38-49) N latitudes and (33-35)E longitude ($M \geq 2$), till today from the time when instrumentals records began to be taken up in 1900 in Kırşehir and its vicinity located in an inland [8-10] (compiled from these catalogs) (Figure 4, Table 1).

Earthquakes coming into existence in the region between the coordinates (38-40)K ve (33-35)D till now from 1900 when earthquakes started to be recorded instrumentally have been given in Table 1. Distribution of earthquakes over time in order to demonstrate earthquake effectiveness of the region has been showed graphically according to years (Figure 5). It is observed that there is a significant increase in the number of earthquakes since 1990. One of the reasons of this increase is seismic activity, as well as an increase in the number of the seismograph. Earthquakes happening in the region between the coordinates (38-40)K and (33-35)D generally focus on the region near Kırıkkale in the northwest (Figure 4) and shows a sequence in the direction of E-W. That is associated with the fault in Ezinepazarı located in KD of Kırıkkale. Compared to this region, earthquakes happen less frequently in the town of Kırşehir and Akpınar. The location of their outside center and their size is unclear, however, 20 pieces historical earthquakes whose records were got came into existence (Table 2.) [11-13].

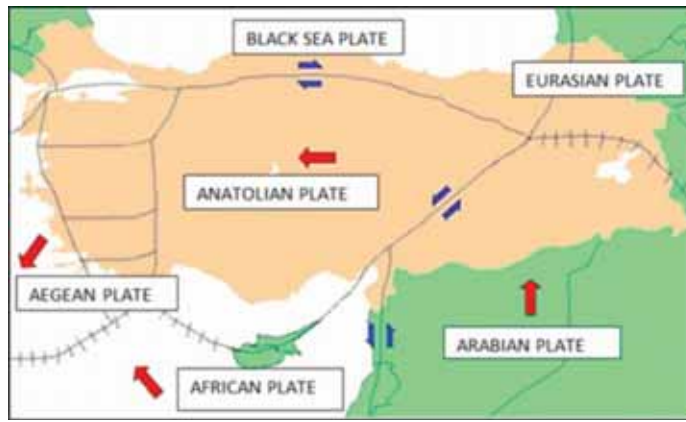


Figure 3: Moving speed of the fault line and plate

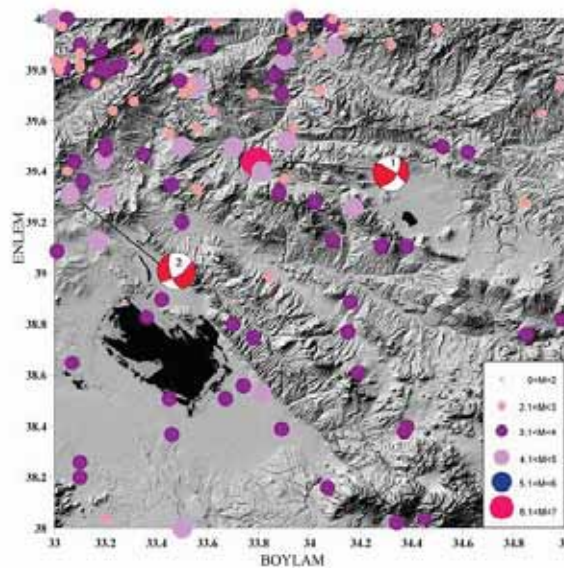


Figure 4: earthquakes whose size is bigger than 2.0 in the region restricted with the coordinates (38.00-40.00)N-(33.00-35.00)E between the dates 01.01.1900-03.2004, focus sucking belonging to Akpınar and Ankara earthquakes

NO	DATE	SOURCE	TIME	LATITUDE	LONGITUD	DEPTH	SIZE
1	13.12.1924	KOERI	18:53	38.00	33.50	00.0	4.9
2	05.07.1928	KOERI	03:31	39.26	34.17	40.0	4.5
3	09.04.1930	KOERI	05:07	39.70	34.00	00.0	5.0
4	28.06.1933	KOERI	11:54	39.30	33.20	00.0	4.7
5	19.04.1938	KOERI	10:59	39.44	33.79	10.0	6.6
6	19.04.1938	KOERI	23:11	39.65	33.87	30.0	5.0
7	27.04.1938	KOERI	10:40	39.89	34.10	10.0	4.6
8	14.05.1938	KOERI	04:45	39.74	33.55	10.0	4.8
9	14.05.1938	KOERI	06:55	39.50	33.70	00.0	4.7
10	28.05.1938	KOERI	00:05	39.40	33.81	30.0	4.9
11	21.07.1938	KOERI	21:56	39.56	33.68	10.0	5.0
12	16.12.1938	KOERI	11:03	39.52	33.91	10.0	4.8
13	23.12.1938	KOERI	01:32	39.50	33.50	00.0	4.2
14	18.06.1968	ISC	10:09:20	40.00	33.00	33.0	4.2
15	06.08.1973	KOERI	10:16	38.20	33.10	0	3.9
16	24.04.1977	KOERI	20:49	39.20	33.50	0	3.1

17	01.04.1978	KOERI	03:05	38.89	34.16	10	3.5
18	04.07.1978	ISC	22:39:16.0	39.45	33.19	23.0	4.9
19	04.07.1978	KOERI	23:20	39.50	33.30	10	4.0
20	05.07.1978	KOERI	23:18	39.49	33.20	0	3.9
21	22.01.1979	KOERI	22:59	39.90	33.60	10	3.7
22	28.01.1979	KOERI	04:36	39.90	33.10	10	3.8
23	10.04.1981	ISC	03:16:42.0	39.00	33.10	38.0	4.0
24	27.02.1983	ISC	07:39:19.0	39.51	33.02	08.0	4.0
25	21.04.1983	ISC	16:18:57.0	39.31	33.06	36.0	4.7
26	24.12.1983	KOERI	04:03	39.50	33.20	10	3.5
27	28.10.1984	KOERI	05:01	38.82	34.99	77	3.3
28	03.03.1985	ISC	13:02:12.0	39.13	33.17	10.0	4.3
29	22.05.1985	KOERI	21:53	39.60	33.70	10	4.0
30	20.10.1986	KOERI	01:47	39.50	34.52	10	3.7
31	17.07.1988	KOERI	23:40	38.99	33.84	10	2.7
32	18.11.1991	KOERI	19:48	38.90	33.42	10	3.9
33	14.02.1992	ISC	03:27:39.0	39.84	33.90	09.0	4.1
34	11.09.1992	KOERI	22:56	39.80	33.20	10	3.0
35	11.12.1993	KOERI	05:21	38.51	33.45	8	3.3
36	19.01.1994	KOERI	18:35	40.00	33.05	10	3.9
37	24.01.1994	KOERI	08:31	39.35	33.46	5	3.6
38	26.02.1994	KOERI	11:37	39.80	33.19	5	3.7
39	11.03.1994	KOERI	08:15	38.51	33.67	0	3.8
40	24.04.1994	KOERI	11:40	39.97	33.16	0	3.0
41	16.04.1996	KOERI	14:11	39.76	33.49	7	3.4
42	06.08.1996	KOERI	00:50	39.11	34.38	5	3.6
43	30.09.1996	KOERI	21:26	39.57	34.03	34	3.0
44	11.12.1996	KOERI	20:12	38.65	33.07	5	3.4
45	02.03.1997	KOERI	21:07	38.61	34.19	8	3.4
46	27.01.1998	DAD	14:08:49.76	39.78	33.86	11.1	3.1
47	07.03.1998	DAD	05:48:14.95	39.32	33.88	12.2	3.3
48	29.03.1998	DAD	14:24:16.16	38.16	34.07	14.2	3.8
49	25.07.1998	DAD	07:25:49.61	38.41	34.78	01.0	3.1
50	29.07.1998	DAD	02:30:01.15	39.95	33.93	14.4	2.7
51	07.09.1998	DAD	10:49:41.00	39.71	33.89	09.8	3.1
52	07.09.1998	DAD	18:32:20.39	39.97	33.61	12.4	3.0
53	16.09.1998	DAD	08:15:32.98	39.48	34.62	04.5	3.3
54	16.09.1998	DAD	15:34:33.17	39.81	33.02	01.9	3.2
55	27.09.1998	DAD	13:23:21.54	39.81	33.04	01.0	3.3
56	01.10.1998	DAD	07:21:56.81	38.11	34.76	14.5	3.1
57	01.10.1998	DAD	17:02:40.78	38.02	34.34	06.2	3.9
58	03.10.1998	DAD	13:54:12.88	38.08	34.86	05.2	3.7
59	06.11.1998	DAD	12:50:22.72	38.01	34.86	01.9	3.0
60	08.11.1998	DAD	10:46:16.86	39.83	33.03	09.9	2.8
61	13.12.1998	DAD	08:14:43.74	38.37	33.46	06.8	3.4
62	17.01.1999	DAD	19:11:57.17	39.89	33.33	19.2	2.7
63	20.01.1999	DAD	14:05:26.68	39.57	33.94	05.8	2.5
64	07.06.1999	DAD	23:09:40.03	38.74	33.61	09.5	4.0
65	08.06.1999	DAD	08:39:09.84	38.75	33.78	01.0	3.5
66	14.06.1999	DAD	07:52:26.00	39.36	33.11	13.6	3.4
67	18.07.1999	KOERI	10:51	38.56	33.74	0	3.6
68	24.08.1999	DAD	09:30:34.47	38.80	33.70	10.9	3.7
69	01.10.1999	DAD	13:16:19.91	39.99	33.45	07.0	2.9
70	02.10.1999	KOERI	23:18	38.26	33.10	1	3.9
71	07.02.2000	DAD	19:20:47.19	39.99	34.08	09.5	3.9

72	07.02.2000	DAD	20:11:47.12	39.98	34.09	09.5	3.8
73	29.02.2000	KOERI	20:43	40.00	33.94	5	4.1
74	03.03.2000	DAD	05:30:07.53	40.00	33.95	10.9	3.3
75	04.01.2001	DAD	14:36:17.90	39.96	34.13	10.2	2.7
76	11.03.2001	DAD	19:21:47.36	38.53	33.81	10.6	4.1
77	13.08.2001	DAD	20:04:46.56	39.64	33.62	06.3	2.9
78	19.01.2002	DAD	12:39:32.43	39.80	33.02	11.1	2.5
79	19.01.2002	DAD	23:24:00.39	39.74	34.98	10.8	2.2
80	24.02.2002	DAD	22:09:41.29	40.00	34.09	03.2	2.1
81	27.02.2002	DAD	21:26:21.48	39.89	33.90	09.1	3.6
82	07.03.2002	DAD	06:12:42.45	38.39	33.89	11.3	3.8
83	18.07.2002	DAD	08:11:18.04	39.28	34.84	05.8	2.6
84	18.07.2002	DAD	13:37:23.58	39.09	33.01	11.1	3.4
85	24.07.2002	DAD	14:49:50.74	40.00	33.33	06.5	3.0
86	31.07.2002	DAD	12:17:07.74	39.37	33.90	05.1	2.7
87	21.09.2002	DAD	03:55:45.50	39.76	33.14	14.0	3.7
88	04.10.2002	DAD	18:21:34.09	38.04	34.45	04.9	3.5
89	16.10.2002	DAD	15:42:09.29	39.82	33.01	01.4	2.4
90	18.10.2002	DAD	10:17:12.32	39.96	33.49	01.0	3.0
91	25.11.2002	DAD	13:45:44.56	39.75	33.16	01.0	2.8
92	07. 12.2002	DAD	12:04:39.18	39.40	33.05	05.6	2.6
93	13.12.2002	DAD	13:43:51.39	39.13	34.09	05.3	3.2
94	18.01.2003	DAD	20:11:46.53	39.28	34.02	05.8	3.3
95	19.02.2003	DAD	05:12:04.30	38.77	34.15	11.0	3.7
96	28.03.2003	KOERI	10:22	39.96	34.50	20	2.4
97	04.04.2003	KOERI	11:03	39.68	33.31	19	2.9
98	04.04.2003	KOERI	10:51	39.64	33.23	13	2.9
99	23.04.2003	DAD	09:37:26.73	39.97	33.03	01.0	2.3
100	12.05.2003	DAD	06:50:04.67	39.72	34.04	05.6	2.3
101	17.07.2003	KOERI	23:36	39.90	34.32	70	2.9
102	17.07.2003	KOERI	13:40	39.98	33.63	6	2.7
103	06.08.2003	KOERI	14:04	39.13	34.27	5	3.0
104	19.08.2003	KOERI	14:01	39.87	33.10	7	2.7
105	27.08.2003	KOERI	11:31	39.11	34.28	10	3.2
106	15.09.2003	DAD	21:00:22.63	39.97	33.97	10.5	2.6
107	19.09.2003	DAD	12:27:33.48	38.76	34.85	01.0	3.1
108	22.09.2003	DAD	16:13:20.06	39.55	33.45	10.8	2.7
109	04.10.2003	DAD	12:09:34.83	39.33	33.56	05.4	2.5
110	19.10.2003	KOERI	14:59	38.04	33.20	6	2.8
111	23.10.2003	DAD	02:45:05.26	39.47	33.35	10.5	3.3
112	31.10.2003	DAD	12:16:26.07	39.57	33.56	05.0	2.9
113	01.11.2003	DAD	19:40:09.23	38.40	34.38	10.5	3.7
114	02.11.2003	KOERI	03:36	38.38	34.37	5	3.3
115	07.11.2003	KOERI	14:18	39.84	33.00	14	2.8
116	11.11.2003	KOERI	00:47	39.87	34.03	7	2.8
117	16.11.2003	DAD	11:04:23.10	39.73	33.16	01.0	3.0
118	19.11.2003	DAD	12:05:18.63	39.71	33.78	17.0	2.8
119	27.11.2003	DAD	10:25:02.53	39.82	33.10	01.0	2.6
120	04.12.2003	DAD	22:50:59.64	39.80	33.21	01.3	3.7
121	05.12.2003	DAD	00:00:25.60	39.81	33.18	04.3	3.2
122	05.12.2003	DAD	13:44:30.59	39.88	33.18	09.2	3.3
123	09.12.2003	DAD	14:45:34.01	39.81	33.10	01.1	2.8
124	10.12.2003	DAD	16:54:51.61	39.71	33.51	10.8	2.9
125	19.01.2004	DAD	09:41:34.37	39.74	33.54	09.5	2.7
126	20.01.2004	DAD	23:10:10.72	39.63	34.91	05.2	2.9

127	28.01.2004	DAD	04:01:45.01	39.82	33.26	08.9	3.2
128	04.02.2004	KOERI	12:41	39.44	33.08	5	3.2
129	18.02.2004	DAD	15:56:44.22	38.82	33.36	10.9	3.3

Table 1: The list of the earthquakes whose size is bigger than 2.0 in the region restricted with the coordinates (38.00-40.00)N-(33.00-35.00)E between the dates 01.01.1900-0.03.2004, (see Figure 3 for the locations of earthquakes) [8-10]

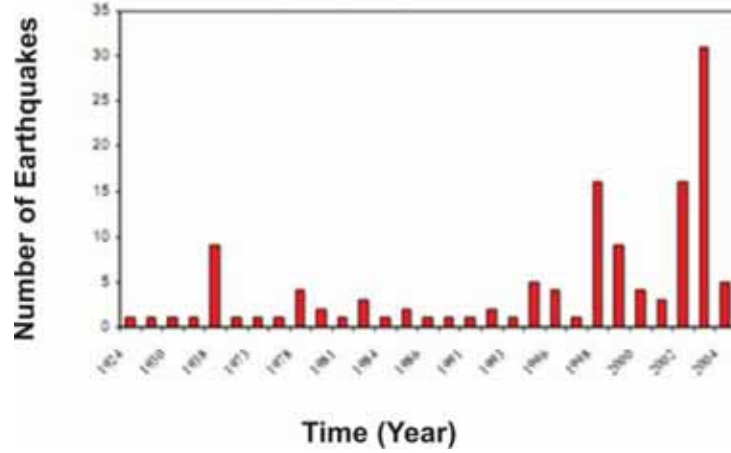


Figure 5: Distribution of the earthquakes over the years whose size is bigger than 2.0 in the region restricted with the coordinates (38.00-40.00)N-(33.00-35.00)E between the dates 01.01.1900-0.03.2004 [8-10]

DATE(YEAR/MONTH/DAY)	COORDINATORS	PLACE	INTENSITY
		Kayseri Sivas	IX
1104		Niğde	IX
1190	37.15-33.20	Karaman-Konya	VIII
1205	38.70-35.50	Kayseri	VIII
1168.08.12		Beypazarı	
1168.08.15		Ankara	
1695.01.01		Sivas	
1704.06.09		Kayseri	
1706.12.26		Konya	
1714		Kayseri	VII
1717.05.09	38.70-35.50	Kayseri	VIII
1754.09.16	39.75-37.00	Kangal(Sivas)	VII
1779.03.14		Divriği(Sivas)	
1794.07.18		Çorum	
1835.08.23	38.30-35.50	Develi(Kayseri)	VIII
1845	40.60-33.60	Çankırı	V
1866	33.80-31.90	İlgin(Konya)	VI
1871		Konya	VI
1888		Çankırı	V
1897.07.02	39.75-31.10	Beylikahir (Eskişehir)	V

Table 2: Historical earthquakes in Central Anatolia between the years 240-1900 [11, 12]

Happened in its northwest, Ilgın, Konya, Karaman, Nigde, Develi, Kayseri, Sivas and its near vicinity. Two mechanism solution of two earthquakes have been done till today in the region bounded the coordinates (38.00-40.00)N-(33.00-35.00)E (Table 3).

No	Date	Latitude Longitude	Depth	Size	Node Solutions		Principle Stress Axes	
					1.Level	2.Level	P Axis	T Axis
					Doğ/dal	Doğ/dal	Az/Dal	Az/Dal
1	19.04.1938	39.44/33.79	10	6.6	118/87		347/18	250/22
2	21.04.1983	39.31/33.06	36	4.7	63.9/72.3		21.5/30.7	114.3/4.7

Table 3: Seismic parameters of earthquakes whose focus mechanism solution has been done in the region restricted with the coordinates (38.00-40.00)N-(33.00-35.00)E, (1) [14,15]

4. FINDINGS

4.1. Spatial Findings of Caca Bey Madrassa

Initially, two columns drew attention, existing on the inside of structure which presented, just opposite the entrance to your right and left hand, and a few feet behind of niche of a mosque indicating the direction of Mecca (Figure 6). These columns resembles each other, but rather than as an array of beads on a string of grains that have been ranked [1].



Figure 6: One of the columns shown on the right

Four sphere and six truncated cone of shapes rowed side by side have been shown at these columns. On Looking in more detail in these columns, a sphere and two truncated cones made a section coming together. There has been an additional independent sphere between two lower sections at these columns (Figure 6). There was an additional sphere embellished over with rich motifs and a larger sphere in stature on the upper one third part of each column (Figure 7).

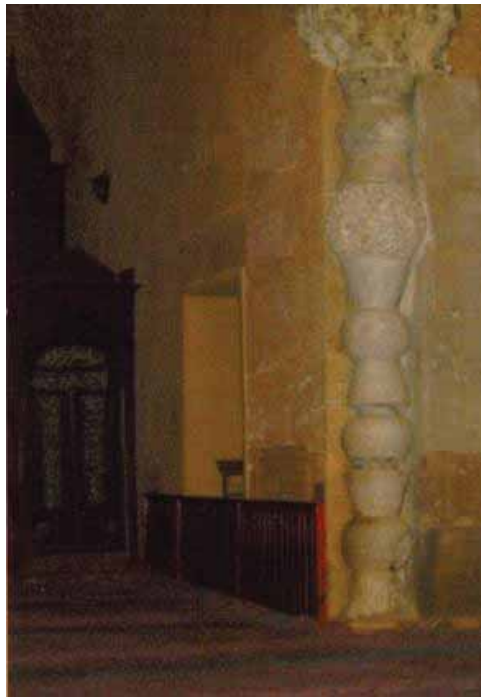


Figure 7: View of the right column

The observation was made that adherence world based observation system in the Caca Bey Madrasa. This system was the most common and the most popular system indicated among scholars of astronomy at that time. It was seen that the other planets, the Sun and all stars were wheeling around the world when the world was taken as the reference point of observation (Figure 8).

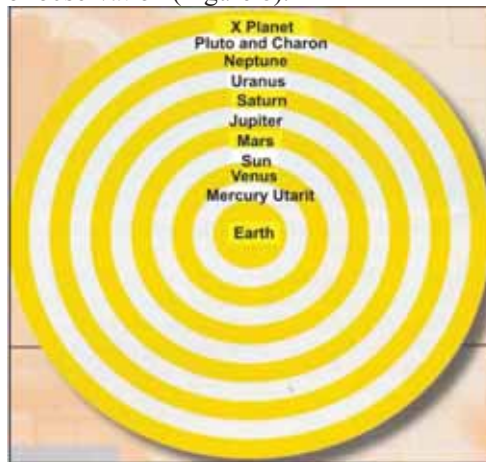


Figure 8: The view of the planets according to the observer to the centre of earth

Interior columns of Caca Bey Madrasa was thought likely to be made as a result of a series of observations as a reference system, which was similar to the Earth. Looking at the movements of the Earth and other planets, some planets have axial curvature during rotations of the planets around the sun. These values are given in Table 4. An angular momentum occurred due to rotation of the planets on their own axis. Conical structure was come out when returned this angular momentum in axial inclination (Figure 9).

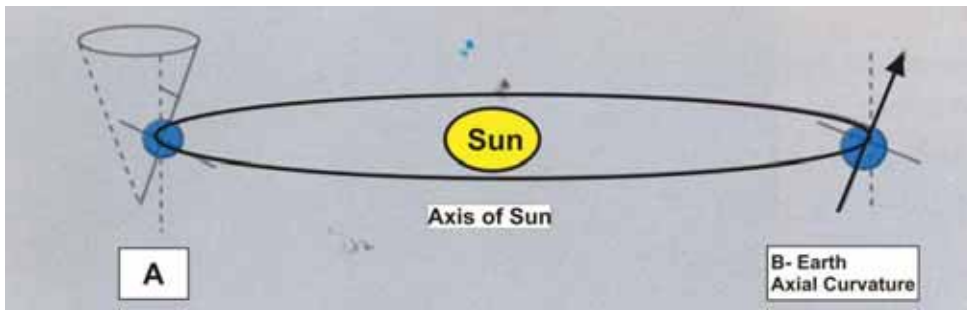


Figure 9: The axial tilt of the World

Planets	Orbital Tilt (Degree)	Axial Tilt (Degree)	Diameter-in equator (km)	Rotation the time	Mass	The distance from the sun
Mercury	7	2	4,870	88 days	0,055xDünya	57,900,000
Venus	3,4	178	12,104	224,7 days	0,8xDünya	108,200,000
Earth	0	23,4	12,753	365,25 days	6x1021 ton	149,600,000
Mars	1,9	24	6,790	687days	0,1x Dünya	227,900,000
Jupiter	1,3	3,1	143,000	11,9 days	318xDünya	778,300,000
Satur	2,5	26,4	120,000	29,5 days	95xDünya	1,427,000,000
Uranus	0,8	98	51,120	84 year	15xDünya	2,870,000,000
Neptun	1,8	28,8	50,538	164,8 year	17xDünya	4,504,000,000
Pluto and Charon	17,1	122 118	2,323 1,211	247,7 year	0,002xDünya	5,900,000,000

Table 4: Information about the world's axial tilt

However, there was no mention conical position of curvature where the planets had no axial curvature, the conical structure occurred. The interpretations of these clomns in the lighth of present data were given blow (Figure 10).

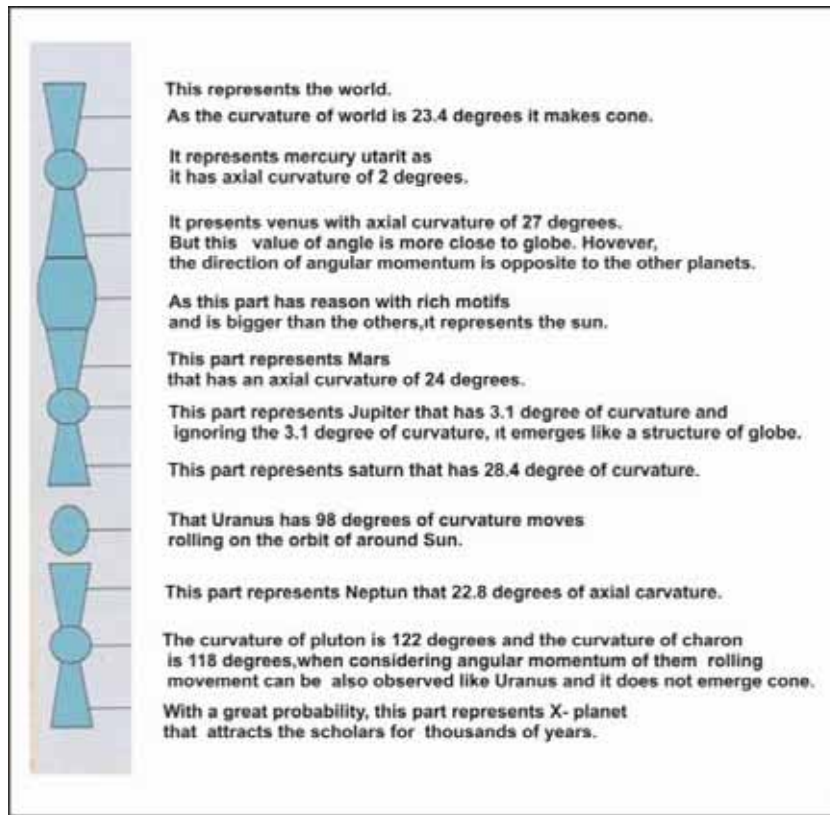


Figure 10: Interpretation of the columns of Cacabey Madrasa that was based on astronomical sciences

4.3 Findings Concerned With Kırşehir Region Seismicity

Kırşehir was located in central Anatolia and its vicinity (surrounding) had the potential to generate an earthquake of interesting position. This region often produces earthquake depending on strike-slip faults. This region is an active region from the point of seismicity. That Kırşehir was located in a region of inland and vicinity were affected by the earthquakes in the different periods as regarding with instrumental and historical records.

5 RESULTS

In conclusion, in this study, it was focused on that the columns may have been made as a result of an astronomical calculations. It was not understood that how the columns were done at that time with the help of these knowledges. However, It was necessary that there should have a close correlation between astrophysics and spectroscopy to reveal such a result. It is known that the origins of astrophysics and spectroscopy goes back to several centuries and even goes back to ancient times.

Kırşehir and its vicinity were in the neo tectonic period and active from the point of earthquake potential as regarding with environmental sustainability and protection of historical heritage. In other words, this region was in a seismic risk zone, this madrasa was to be renovated and strengthened to sustain its life bounding with actual structure and fidelity. In addition to this, geotechnical investigations and seismic survey must be performed by drilling the soil exploration wells around the Madrasa. It must be obtained more understandable knowledges about the magnitude and risk of parameters reflected by soils to structure due to earthquakes. In the light of these knowledge mentioned herein, it may be possible to take precautions in more detailed against the probable hazards. In 1938, an earthquake moment magnitude of 6.6 occurred in town of Akpınar in Kırşehir. It is estimated that an earthquake may be occurred after 77 years later according to the calculations predicted, that is in 2015, taking into consideration the interval of recurrence of this earthquake mentioned.

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