PRELIMINARY REPORT ON THE RESULTS OF THE EXCAVATION, MADE UNDER THE AUSPICES OF THE TURKISH HISTORICAL SOCIETY, IN THE CACA BEY MADRASA OF KIRŞEHİR, TURKEY.

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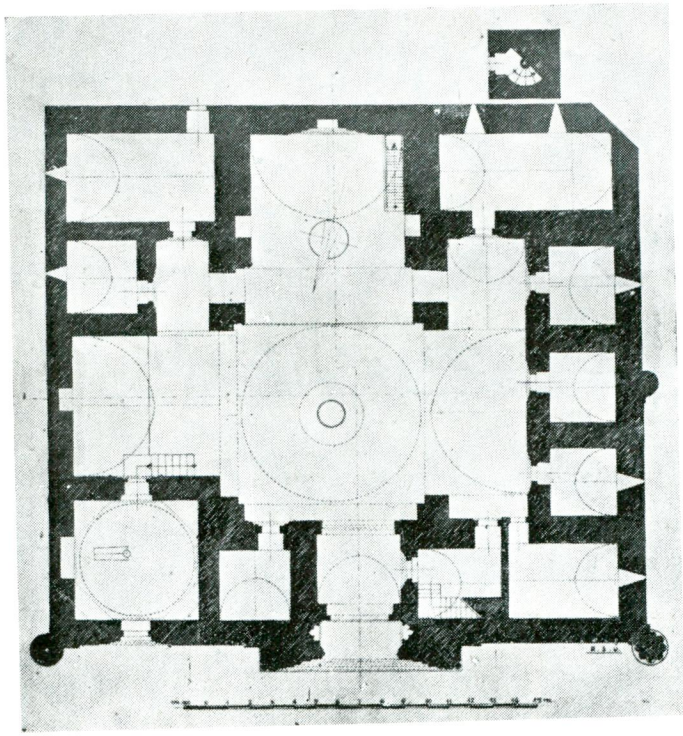
Local Tradition Concerning the Caca Bey Madrasa.

The aim of the excavation was to establish the factual value of the legend and local tradition claiming that this institution was a madrasa for teaching astronomy. The Madrasa was built in 1272 (H. 671) by Nûr al Dîn Jibrîl ibn Jâja (Caca), governor of Kırşehir during the reign of the Saljuq emperor Giyâth al Dîn Kaykhusraw ibn Qilij Arslan.

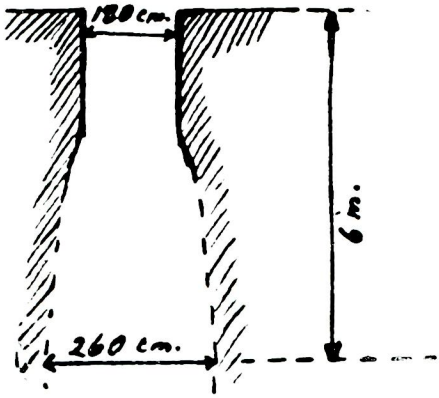
At the present time this building is used as a mosque. The uppermost inscription over the entrance on the façade ef the building, as well as its architectural features and plan of construction, leaves no doubt that it was originally built as a madrasa. It served as a madrasa for several centuries and began to be used as a mosque only a few generations ago. The problem to be investigated is, therefore, not whether it was a madrasa, but whether it was a madrasa for teaching astronomy. In such a case, most likely, the Madrasa would not be devoted exclusively to the teaching of astronomy, but along with other subjects, instruction in astronomy would also be available in it.

According to local tradition there was an "observation well„ inside the building and directly under the opening of the dome. A circular hole was left on top of the dome; this opening has been closed in relatively recent times with a superstructure in the shape of a small tower. Apparently the earliest appearance in



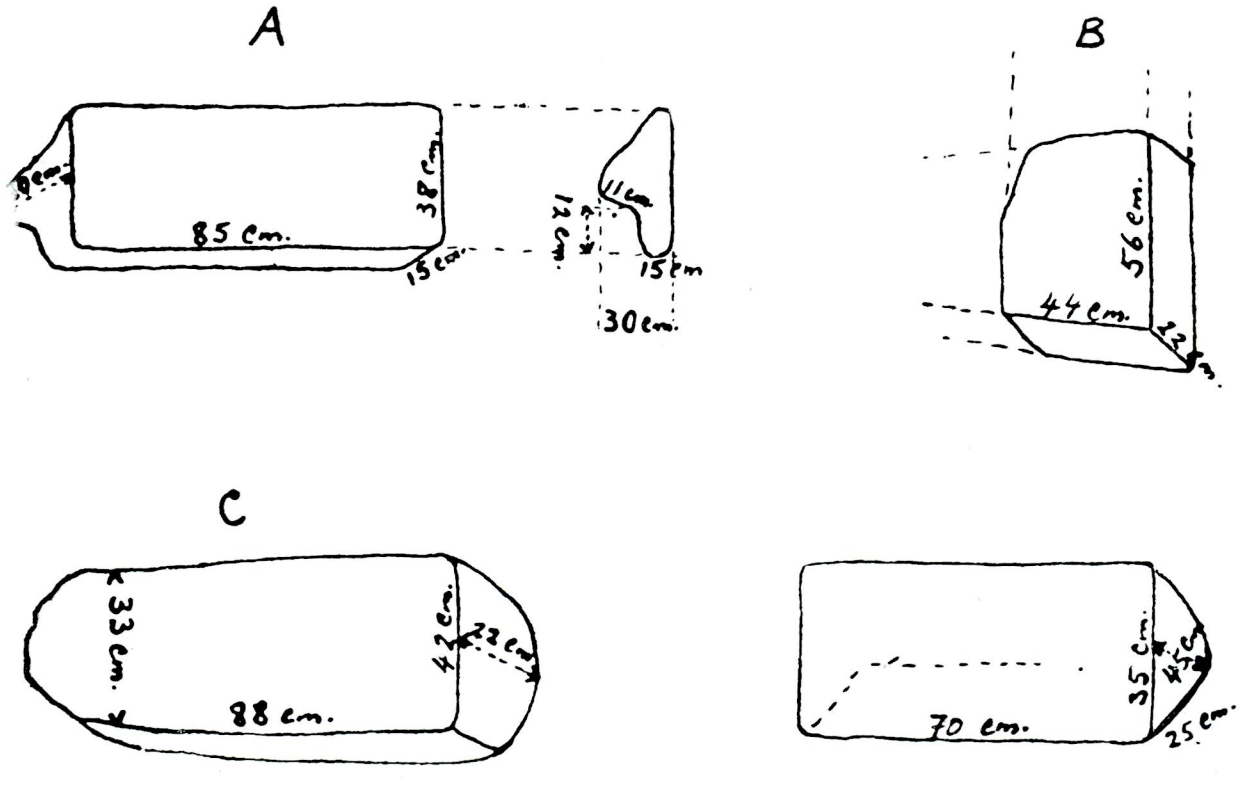
Res. 1 — Cacabey Medresesi'nin genel plânı. (Bk. A. Saim Ülgen, Vakıflar Dergisi, sayı 2, s. 261, Res. 1).

Fig. 1 — General plan of the Caca Bey Madrasa. (Taken from A. Saim Ülgen, Vakıflar Dergisi, No. 2, p. 261, fig. 1).



Res. 2 — Kuyu çapının aşağı doğru genişlemesi.

Fig. 2 — Vertical cross section ; the conical shape of the well.



Res 3 — (İzahat karşı sayfadadır).
Fig. 3 — For explanation see next page.

A 5,5 ile 6 metre arasında bulunmuştur. Bundan sonra çıkan büyük taş B dir. Satıhları yontulmuş, fakat bir parçası kırılmış hissini vermektedir. Bu taş kuyunun güney duvarına bitişik ve düz sathı yukarıda olarak bulunmuştur.

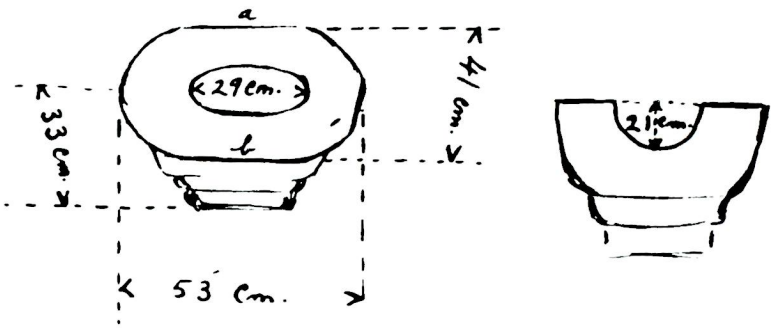
B'nin tam altında kuyuda çıkan en büyük taş bulunmuştur. C 6 metre ile 6,5 metre arasında, ucu duvarla temasta ve muhaddeb sathı yukarıda bulunmakta idi. Satıhları oldukça muntazam, fakat şuradan buradan küçüklü büyüklü parçalar kopmuş.

C'nin seviyesinde ve karşı duvarla temasta yassı bir taş daha bulunmuştur. Sathının ebadı takriben 30×40 sm. dir.

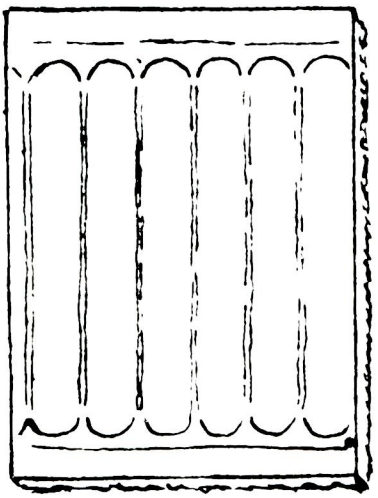
D Kuyunun ortasında 6,5—7 metre derinlikte bulunmuştur. Prizma şeklindedir. Maktaı ikizkenar üçgen şeklindedir.

A was founde between 5,5 and 6 m. depth. B was found at a slightly deeper level. B appears to have been a carefully cut stone, but two of its sides to have broken away. This stone was found lying against the south wall of the well, its flat surfaces atanding horizontally. C, the largest stone found in the well. was contiguous to and underneath B. It was at a depth between 6 and 6.5 m. It touched the periphery of the well, its convex surface facing upward. Its surfaces are quite ragular in shape but broken at certain points. Another flat stone was found at the same depth as C but on the opposita side of the well. Its surface measured approximatey 30x40 cm. D was found in the middle and at a depth of 6,5—7 m. It is in the shape of a prism, its cross section being an isosceles triangle.

Res. 4 — S. 678'e bakınız.
Fig. 4 — See p. 688.



Res. 5 — Karşılıklı iki kenar (a, b) düz ; üçüncü kenarda da küçük bir satıh var.
Fig. 5. The two facing sides a and b are flat and there is also a small flat part on one of the other sides, as seen in the picture.

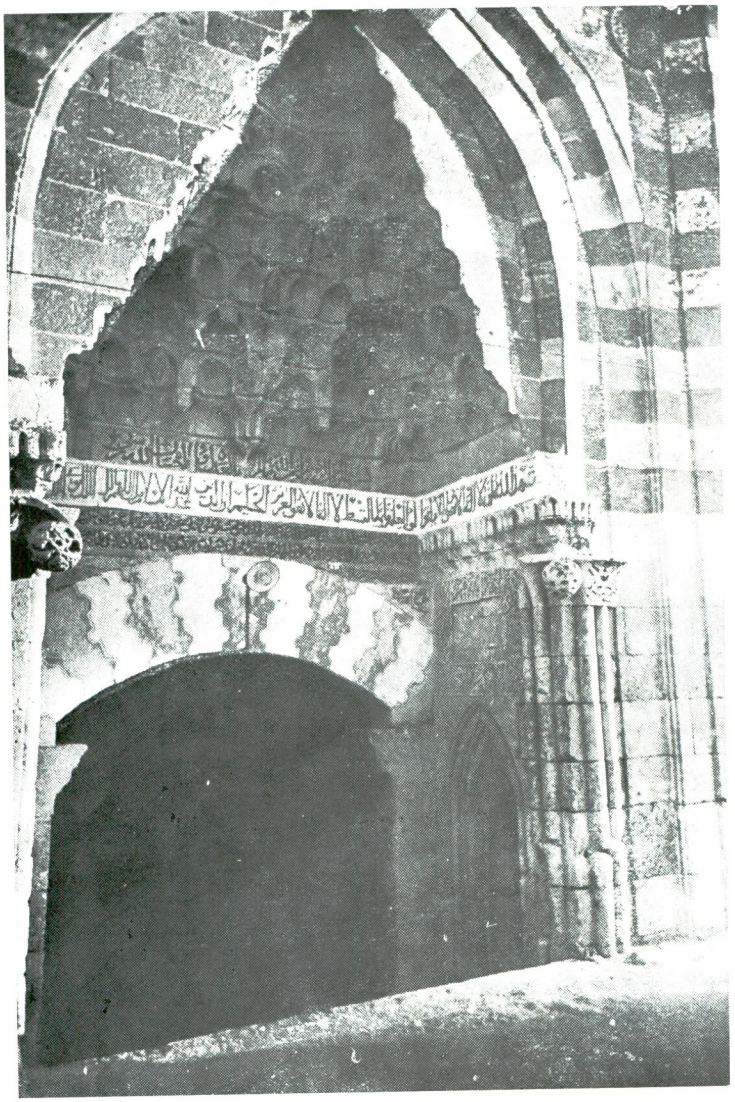


Res. 6 -- S. 679'a bakınız.
Fig. 6 — See p. 689.

Res. 7 — S. 679 — 80'e bakınız.
Fig. 7 — See p. 690.

Res. 8 — Cacabey Medresesi'nin önden görünüşü. Sivri kubbeli kısım Caca Bey'in türbesidir. Kapı önündeki toprak yığını kazı neticesinde meydana gelmiştir. Kubbe ortasındaki deliği kapatmak için yapılmış olan kârgir ilâve, üstü kiremitli olan kısımdır.

ig. 8 — The Caca Bey Madrasa, frontal view. The part with a conical dome is the mausoleum of the founder of the Madrasa. The pile of earth near the door is a result of the excavation. Note the superstructure with tiled roof ; it marks the part of the dome which was originally left open.



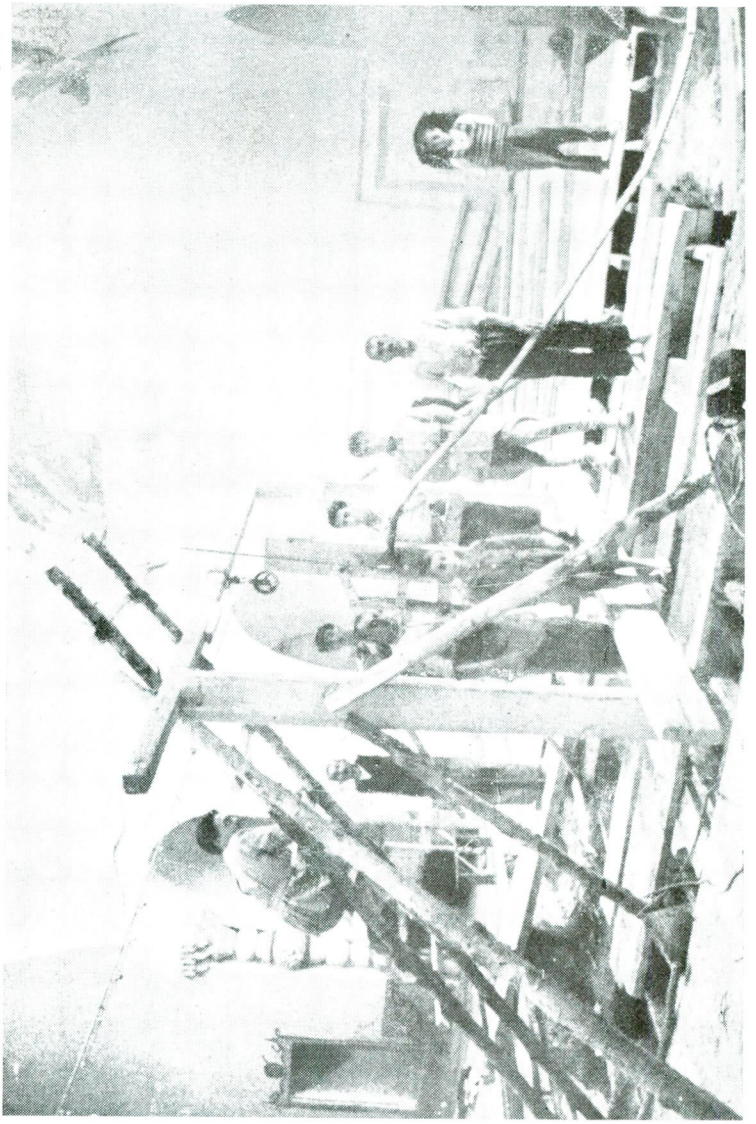
Res. 9 — Medresenin giriş kapısı. Kapı eşiğine merdivenle inilmektedir. Halbuki eskiden yer seviyesi şimdikinden belki takriben iki metre daha aşağıdaydı ve rivayete göre Medrese kapısına merdivenlerle çıkılıyordu.
Fig. 9 — The entrance of the Madrasa. The threshold is now below ground level, and there are staircases leading down to the Madrasa's floor level. Originally the situation used to be the opposite. It is said that the ground level was below the level of the floor of the Madrasa and there were staircases leading up to the door. The rise in the street level has perhaps been as much as two meters.

Res. 10 — Kuyunun ilk sarih izi.
Fig. 10 — The first clear sign showing the existence of the well.

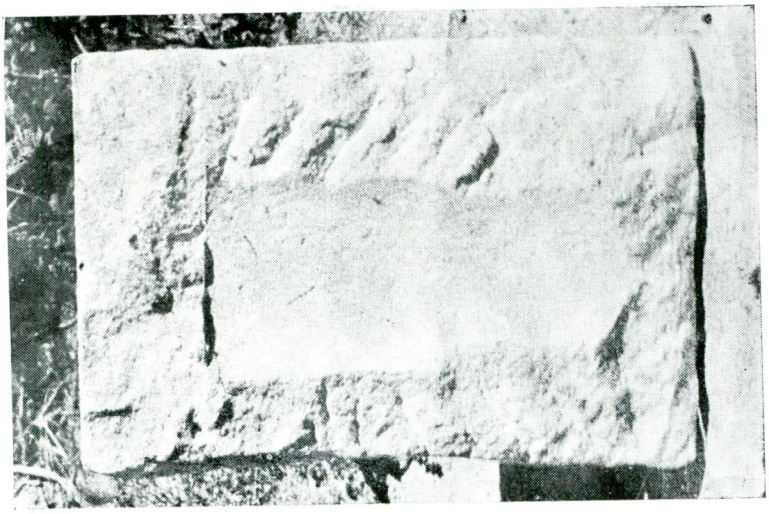
Res. 11 — Daha su çıkmadan kuyudan bir görünüş.
Fig. 11 — A view of the well before the level of water was reached.

Res. 12 — Çan şeklindeki küp.
Fig. 12 — The bell-shaped jar.

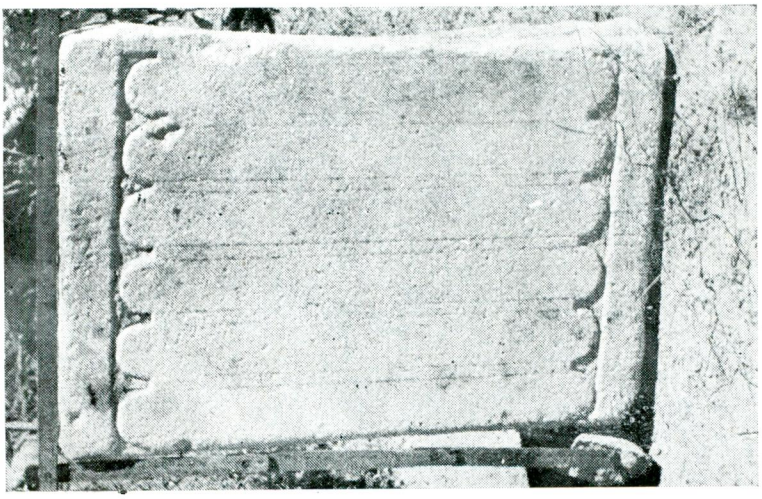
Res. 13 — Çember şeklindeki küp gövdesi parçasının yeri.
Fig. 13 — The place where a section of a jar in the form of a ring was found.



Res. 14 — Kazının son safhalarını tesbit eden bir resim.
Fig. 14 — The last stages of the excavation.



Res. 16 — Mermer safihanın arkası.
Fig. 16 — Back of the plaque.



Res. 15 — Medrese damında bulunmuş olan mermer safihanın önden görünüşü.
Fi 15 — The marble plaque found on the roof of the Madrası ; ferotal viw.

printed form of the tradition in question is a note in Ankara Salnâmesi (Ankara Year-Book) from the year 1325 of Hijra, i. e., about forty years ago. As an oral tradition it is quite well-known in Kırşehir. Ömer Hoca, who served as *imâm* of the Caca Bey Mosque for about sixty years, relates from his grandfather that it was he who filled up and closed the well.

In the local tradition it is claimed that astronomical observations were made form the well through the hole in the dome, but no specific details are given, and no clear distinction between an ordinary well and an "observation well„ is made. It is believed by some that the reflected images of the heavenly bodies in the water were observed by the astronomers. Neither is there any definite and clear information or detail concerning the existence of water in the well. No answers, e. g., are given to questions such as the manner of drawing water form the well.

The well should be dry if it were really an "observation well„. There are bits of information in the local legend which are of interest in this respect. A visitor form Mucur, in the vicinity of Kırşehir, said he had heard by word of mouth that the "Caca Bey Observatory„ was in some ways superior to other observatories of its time; stars which could not be observed form other observatories were observed from this one, or a new star or certain new stars had been discovered in this observatory.

This information may be interpreted to mean that day time observation was possible form the well. In this case, the well should be both dry and deep. It may have been necessary to take measures to render the well water-tight against seepage or subsurface beds of water; and the excavation has shown that this was indispensable if the well was not a water well. There are stories too which are of interest in this respect.

Underground conduits constructed with flat stones were found in the gardens of Kasap Kadri and Osman Sülükçü on Namazgâh Street, in the vicinity of the Caca Bey Madrasa. They were observed to turn in the direction of the Madrasa; they were filled and blocked with sand and soil and were dry. In additian, stories exist that the Madrasa was once flooded, and that straw thrown into the well was observed to come out in the water flowing at another point of the city. It is also said that an

underground tunnel extended between the Caca Bey well and the Lâle Mosque in the neighborhood, and that a certain person had walked through this underground passage with a candle and had examined it.

Stories of the latter types are to be found in other localities too, and one should be cautious about accepting them as true. Nevertheless, they are of interest here, for they imply that the well was dry, and that certain measures may have been taken to keep it dry.

One also meets the claim that the minaret was originally an observation tower, and the fact that it is located on the south-west corner of the building is mentioned in support of the view that originally it was not a minaret. But this argument does not seem to be part of a legend; apparently it is a rationalization which has occurred to those who want to support and strengthen the claim that the Madrasa served the purpose of teaching astronomy. There is at least one person too who has occasionally insisted, without giving any reasons, however, that the well had nothing to do with astronomy and that it was a water well pure and simple. Apparently he was not a transmitter of any stories he had heard, but had his fears that the building might be converted into a museum and the city deprived of its most beautiful mosque if the well were found to be an observation well.

The Original Level of the Floor of the Madrasa and the Position of the Well.

The excavation was started by removing a section of about 7×3 m. of the present wooden platform, a section directly under the dome.Under the platform a layer of flood soil of about 15 cm. thickness was found. The soil in this layer was very loose ; it could be removed by shovel and needed no digging. Under this layer, the ground was found to have been paved with rather large and regularly shaped flat stones. There was no pavement in the middle, i. e., in a space corresponding in dimensions approximately to those of the opening of the dome directly over it (the diameter of the circuler hole on the dome is about three meters) ; this is the space where the well was later found. Only the two ends, i. e., sections having the dimensions of 2×3 m. on both extremities were found to be paved.

These pavements contradicted the claim of an old man according to whom the level of the original floor must certainly have been considerably below the present one. For an examination of the foundation stones showed that the original floor level could not have been much below the pavements found. The foundation stones examined were those on the west side of the inner door of the building at the corner where two arches join. A large horizontal stone forming part of the foundation stones was found to rest under the pillars joining the two arches. Its surface projecting out from the walls was observed to have been cut into a smooth surface in its sections near the walls and presumably in the sections under them, the parts further away from the walls being rough and irregular. This stone, which must have remained below the original platform, is 75 cm. below the present wooden floor. The wooden platform, the beams, and the stones on which they rest occupy a depth of about 20 cm. Underneath, there are the above-mentioned 15 cm. of loose soil, and about 20 cm. of pavement stones. This means that the stone pavement is 20 cm. above the horizontally projecting foundation stone, and that the flat stones either represent the original floor or correspond roughly to its level.

Excavation was continued in a space directly below the dome measuring approximately 3x4 m., with the hope of finding clear traces of the stone walls of the well. No such walls were found, however, and the excavation had to progress in the form of cautious groping. In the center a narrow section was dug to a depth of two meters, and this hole was then widened radially outward. This process turned out to be very helpful. For although certain stones found proved to be false alarms, as the hole was widened, the periphery of the well began to appear as the boundary between an outer section of hard virgin soil and a cylindrical central column of relatively loosely packed earth. This central portion easily fell off, and the contour of the well became apparent by itself. The same situation continued at deeper layers. The well, stripped of its stone walls, could be traced up to one meter below the present platform. As the digging above this level had been done horizontally, the well could not be traced further up.

The level of the mouth of the well remains unknown. It should be the same as the original platform, or higher. Without its stones, i. e., at its present state, the diameter of the well is about 180 cm. This diameter has been observed to increase gradually beginning from a depth of 3 m. The stones forming the retaining walls have been found to be absent down to a depth of 7.5 m. where the excavation was stopped. The distance between the threşhold of the inner door and the point of the circumference of the well closest to it is 4 m. The well is directly under the hole at the center of the dome.

The Depth of the Well.

A considerable number of stones were found inside the well. Almost all these stones were small or medium in size and irregular in shape. It is reasonable to assume that they were thrown in for filling the well. A few fairly large and regularly shaped stones were also found. Moreover, some of the stones were found standing squarely against the walls. Generally, these stones too seem not to have been part of the retaining walls, however, but to have stopped against the walls when they were thrown in. At least, they seem not to be standing in their original positions. The largest stones were all found after six meters depth. Some of the medium size irregular stones may have been part of the stone structure inside the well; they may have served as auxiliary wall stones.

Apparently the stone walls collapsed at a certain time and fell into the well. As these stones seem to be found only sporadically and especially at depths exceeding six meters, the natural conclusion to be drawn is that the well was considerably deeper than six meters at which water appeared. This means that the bottom of the well was much deeper than that necessitated by a water well. One is, therefore, led to think that if the well could be kept dry, this evidence may be considered to support the local legend that the well was an astronomical one. As it was impossible to continue the excavation beyond about 7.5 m., however, the depth of the bottom of the well could not be determined.

After a depth of three meters the well began to widen regularly toward the bottom. At 6 m. the diameter was found to be 260 cm. (fig. 2). Apparently the well was intentionally built in the shape of a cone. Due to the following reasons, however, the observed widening of the well may be exaggerated compared to its original shape. At a depth of about 3 m. a local and small pocket of sand was observed around the southeast section of the well; this is the point where widening starts, and at this level the tapering shape of the well is most pronounced. Moreover, it is reasonable to assume that due to direct contact with water and through capillary action the walls were eroded especially after the collapse of the retaining walls. Such erosion would naturally be most pronounced at depths close to the level of water, and the process of erosion through moisture would decrease gradually up the walls. Nevertheless, the position of certain stones, e. g., the stone marked C in fig. 3 and those found around it, give an impression that the well was originally built in the form of a cone.

Water in the Well.

Water appeared at the sixth meter. At 7. 5 m. water was rather copious, but contrary to the expectation of the well-digger it did not flow freely. Using his expression, it was "pent-up„ water; it seeped into the well from many directions, including the bottom, and the points of maximum seepage kept changing. The waters of the wells in the neighborhood appear at equivalent or higher levels and are in the form of underground fountains, according to the well-diggers of the town. Probably in this well such a vein exists at a deeper level. Perhaps too, we had dug through and gone below the water bearing stratum. In this case, the water continued to be "pent-up„ possibly because certain measures had been taken to lead off the water; and although this system has ceased to function properly it is not completely ruined. As we have seen, certain local legends tend to indicate that the water of the well was diverted in order to keep the well dry.

Three days after the water level was reached in the well, we were informed that our activities had affected the volume of a little contributory of the stream. This little body of water

comes out in the form of a spring and pours into the pond in the garden of Hacı Halil oğlu Ömer, then follows a short underground course to come out again and join the stream. We were told that all of a sudden it had very noticeably decreased in volume ; it had almost dried up. Other people also assured us they had never seen it so meager before. The underground conduits mentioned before are between this point and the Madrasa, and the terrain slopes gradually from the Madarasa to this section of the stream, i. e., in the direction of west-southwest. It was considered worthwhile, therefore, to give some attention to this problem.

Some indigo was thrown into the well that evening to see if this would establish any connection between the well and this point, but the next morning no coloration could be seen in the little streamlet. Neither was there any noticeable trace of the pigment in the well, however. This may be interpreted to mean that there really is a considerable outward flow of the water of the well, although our experiment did not serve to indicate any connection between the two points. One informer gave the news later that the volume of the streamlet had not increased after the refilling of the well.

Osman Sülükçü, who has been mentioned before, remembers the existence of a well until about forty years ago at apporoximately fifty meters to the west of the Madrasa. Within this well, on the north side, there were flat triangular stones projecting away from the walls in a manner to facilitate going down and up the well. This well may have served as a first step in leading off and draining the water of the Madrasa well.

Stones Found Within the Well; Arrangement for Getting in and out the Well.

The larger stones shown in fig. 3 will be observed not to differ very much in their dimensions. Moreover, all three resemble steps of staircases and are different only in details. It is possible that they formed parts of a winding staircase in the well. In that case, they were probably not cut especially for the well, but were chosen because their shapes made them convenient for such use. The piece of marble found at a depth of 7.5 m. and seen in fig. 4 may be considered to support such a view. Nothing

final can be said concerning these matters, however, without first examining other stones which may be found at greater depths. The excavation was brought to an end without being able to pull out a large piece of marble first seen at 7.5 m. If the well were an observation well, it must necessarily have been equipped with convenient means of up and down traffic. Such a question may have been solved by a staircase fitted into an inclined tunnel leading from another part of the building to the bottom of the well. At all events, these stones must have been part of the well; they are too heavy to be carried from outside and thrown into the well for the purpose of filling it. Considering their shapes they would not be very convenient for the mouth of the well, and if they formed part of the retaining walls, this would be an indication that the well was one built at least with special care.

At a depth of about 220 cm. a hollow hemispherical piece of marble, resembling the cracked-wheat mortars of Anatolia, was found (fig. 5). This was made by boring a deep convex surface on a base of a column. Its size is too small for being a wheat mortar, and too big for being a coffee mortar, but very likely it was a mortar for a variety of purposes. One may venture the guess that it may possibly have been a concave sun-dial. The dimensions of the concave surface bring this to mind, and another indirect evidence in support of such a possibility is that the point where a horizontal pointer could have been fixed is broken. No network of curves can be seen on the concave surface, but this may be due to its later conversion into a mortar. At a depth of about 7. 5 m. another hollow stone, resembling the above-mentioned one, was found. The concave surface of this stone was much larger and the sides thinner. This stone was in the shape of a quarter of a sphere.

A single flat piece of marble was found abandoned on the roof of the mosque (figs. 6, 15, 16). It resembles plaques with which walls are faced for purposes of decoration. It is about 4-5 cm. thick, and the lines seen on its polished surface are grooves about 1 mm. deep. The sides of the stone are trimmed and finished into strips of smooth surfaces near the front edges. The remaining parts near the back edges of the sides are only rough-

ly cut and they slightly project outward, so that the sides have the form of rabbets. It is possible that this single and isolated plaque was used as an abacus in the Madrasa. The back surface has been left rough except for a section of cylinder cut out in the middle.

Furnace and Jar.

To the west of the well and within the excavated area a bell-shaped jar was found. Both its top and bottom were left open. The top was about 85 cm. below the platform, and the height of the jar was 90 cm. (figs. 7, 12). The edges of the bottom were decorated with a pattern of waves in relief. This jar was fixed firmly to a foundation constructed with pieces of stone and a mortar made of powdered brick (khorâsân), and its sides were supported and propped with the help of large pieces of pottery. The jar was found to be full of earth containing a few fragments of plain and glazed pottery as well as some bones and egg shells. The bones were mostly rib bones. Ashes, charcoal, and burnt pottery were found to be very abundant in the earth surrounding the jar. The jar itself, as well as the earth within it, was free from traces of fire. About 30 cm. below the bottom of this jar, a section, in the form of a ring, of another jar was found. This was larger in diameter and the height of this cylindrical ring was about 20 cm. (figs. 7, 13). Below this, no traces of burnt material existed. Inside the well too, burnt wood was occasionally encountered.

The earth around and inside the jar was carefully removed. As the scraping progressed it wus found to be cracked in many parts, however, and it was impossible, therefore, to bring it out in one piece.

It appears that this was the site of a furnace, and that several furnaces were built here successively. Later it ceased to be used as a furnace ; the bell-shaped jar was placed here and used probably as a place for storing food. The furnace and the jar may be older than the Madrasa, or they may have been used in the Madrasa. A rather rich and interesting collection of pottery, now at the Ethnographic Museum of Ankara, was found during the excavation. The conclusion reached by Remzi Oğuz Arık, director of the Museum, is that as the region has mostly been

filled artificially, these finds present no stratigrahpic sequence and are of no help in chronological respects.

The End of the Excavation.

After encountering water, the pace of the excavation slowed down rapidly. The water was drained with the help of a mechanical pump. On the morning of 7-4-1947 water was emptied in twenty five minutes, on the morning of 7-6-1947 in one hour and twenty five minutes, and on the morning of 7-7-1947 in two hours. Down to the sixth meter the walls were braced with the help of a wooden structure. After this level such fortification ceased to be effective. As a reslt of contact with water all night, chunks of earth were in danger of detaching themselves and falling off the walls, and had to be taken down and cleaned away. Thus the tapering of the walls increased in this section, and the mud to be hauled up per unit gain in depth increased considerably. Considerations of safety, as well as financial and technical difficulties, made it impossible to continue the excavation. Filling the well was more safe and less costly than trying to keep it open with the help of adequate fortifications and bracings. The well was, therefore, filled back to a depth of three meters.