

THE GAMING PIECES FROM THE GLASS WRECK  
AT SERÇE LIMANI, TURKEY

A Thesis

by

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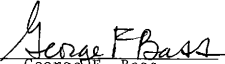
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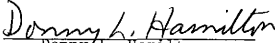
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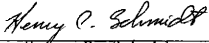
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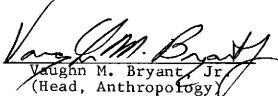
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## ABSTRACT

The Gaming Pieces from the Glass Wreck at Serçe  
Limani, Turkey. (August 1985)

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Over the course of three field campaigns a team from the Institute of Nautical Archaeology and Texas A&M University excavated an 11th century shipwreck at Serçe Limani, Turkey. In the tens of thousands of artifacts recovered from the site, a number of gaming pieces were found. Study of these pieces, eight chessmen, a tableman (probably for backgammon), and a "die", is part of the general program of research on all aspects of the shipwreck.

The gaming pieces provide insight on a number of levels. The locations they were found in most probably are living-quarters areas of the shipwreck. The shapes of the chessmen suggest that their owner was either Islamic or in close contact with Islamic society. The chessmen are simple, hand-carved, wooden pieces. This simplicity makes them rare and important "common" pieces from their time.

The "die" is no longer considered to be a gaming piece. It is almost certainly a weight, perhaps from

North Africa.

The study of the gaming pieces illustrates the information which can be drawn from even the smallest pieces of an archaeological puzzle.

## DEDICATION

To George Bass, the man who wrote the book  
... and taught us how to read it.

## ACKNOWLEDGMENTS

I gratefully acknowledge the incalculable assistance of my committee chairman George F. Bass, in the preparation of this thesis. Without his tremendous help it simply would not have been possible to complete the work.

My thanks also to D.L. Hamilton and H.C. Schmidt, the other members of my committee, for their continuing support, encouragement, and patience.

I owe an inestimable debt to Mr. H.J.R. Murray, the author of A History of Chess. His monumental work was the keystone in my research. I suspect it has been the case for all those who have written on the subject of chess.

A number of experts around the world were kind enough to respond to my various questions and I acknowledge their help. A special thanks in this respect to Mr. R.C. Bell in England and Mr. C.K. Wilkinson in the United States.

Thanks to Cemal Pulak for his photographic and other help from Bodrum. Jay Rosloff's efforts in sorting out and forwarding field notes information were much appreciated. Thanks also to various colleagues at Texas A&M for many pertinent references. Don Keith has been particularly helpful in this regard.

Finally, a special thanks to my wife Pat. Her technical assistance in my research was extremely helpful to me. Beyond that, I thank her for her unending patience, her unflagging support, and her unbelievable strength in difficult times.

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## CHAPTER I

## INTRODUCTION

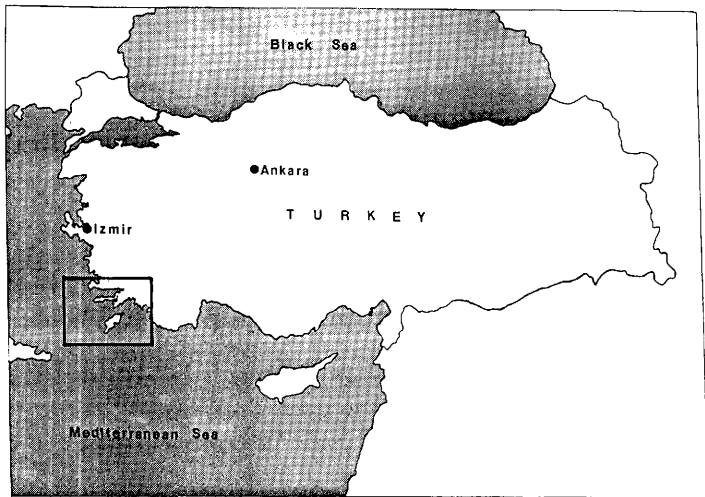
"...Human life and human institutions can be better understood by - and indeed cannot be thoroughly understood without - a study of societies which includes their pastimes and the games they played..."<sup>1</sup>

Over nine and a half centuries ago a medieval merchant vessel entered the isolated harbor at Serçe Limani, Turkey (ills. 1 and 2),<sup>2</sup> no doubt for the security of the harbor's protected waters (ill. 3).<sup>3</sup> Her captain may have been attempting to find refuge from an Aegean storm, or trying to escape marauding pirates who infested the coast at that time.<sup>4</sup> Whether she was caught unprepared and pushed against the rocky shore by the unpredictable winds that sweep down from the surrounding hills, or trapped and sunk by a pirate craft, we may never know. We do know that within a few hundred meters of shore, not far from the harbor's entrance, and probably with very little warning,<sup>5</sup> she sank quickly to the seabed 35 meters below (ill. 4).

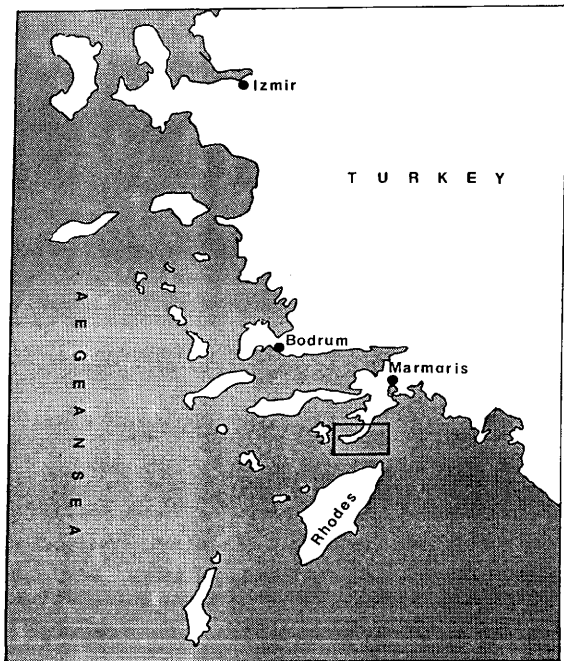
In 1977, a team from the Institute of Nautical

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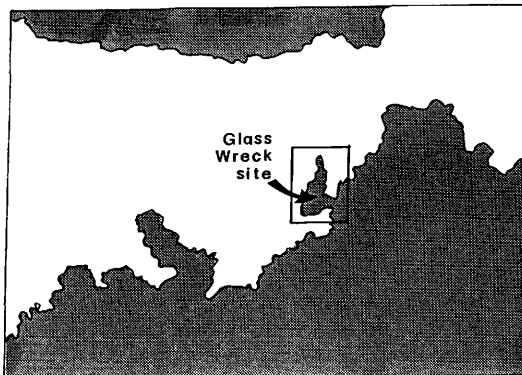
The American Journal of Archaeology provides the model for format and style.



Ill. 1. Map of Turkey. Glass Wreck site area on southwest coast shown in box.



Ill. 2. Southwest coast of Turkey. Serçe Limani area in box.



Ill. 3. Serçe Limani area shown in box.



Ill. 4. Serçe Limani (Sparrow Harbor). Arrow indicates location of Glass Wreck. (Photo by K. Cassavoy)

Archaeology and Texas A&M University began the archaeological investigation of this medieval ship.<sup>6</sup> Over the course of three field campaigns the contents and hull fragments of the ship were recorded in detail, raised to the surface, and removed to the Bodrum Museum of Underwater Archaeology for conservation and analysis.<sup>7</sup>

During the excavation, tens of thousands of artifacts were recovered. After a simple preliminary examination, the functions of the vast majority of these finds were immediately apparent or relatively easily determined. However, a number of individual artifacts and groups of artifacts remained unidentified, their uses unclear. In a preliminary study of photographs of one of these groups, the author identified four medieval chessmen of Islamic design. Later study and physical examination of site materials produced identifications of an additional four chess pieces. These chessmen, along with an earlier identified backgammon tableman and a bronze object resembling a die, were grouped together in a general "gaming piece" category of site artifacts which forms the focus of this study. The examination of these gaming pieces is part of a general program of research on all aspects of the ship, her cargo and her crew.

Already a great deal has been learned. It appears that one of the ship's primary cargoes was several tons of



glass cullet (both scrap glass and raw glass), no doubt destined to be remelted and fashioned into new glassware.<sup>8</sup>

Because of this, the wreck has been called simply the "Glass Wreck" by its excavators. Other cargoes have been established as intact glassware, amphoras of wine, kitchen ware, glazed bowls, and other types of ceramics.<sup>9</sup> We know that the ship had a much flatter hull bottom and a more box-like hull shape than expected, reflecting perhaps a special cargo purpose or, more importantly, a slightly different shipbuilding tradition than that seen in other, earlier Mediterranean vessels.<sup>10</sup> Study has revealed that the vessel carried at least seven types of common tools for shipboard use and a great quantity of varied fishing implements, including a multi-tined fish spear. Evidence of the remains of lentils, olives, a variety of nuts and fruits, and sheep and/or goat and pork bones indicate a diet for those on board which went well beyond the staple of fish. Swords, lances and javelins found on the ship suggest a need to protect the commercial interests of the vessel. Three gold coins, fifteen gold coin clippings, forty copper coins and a great variety of weights and weighing implements provide some insight into her commercial activities. Combined evidence from the dated coins and glass weights indicates the vessel sank around A.D. 1025.<sup>11</sup>

Still, after several years of study, important questions concerning the nationality of the ship, her builder, her owner, and her crew remain unanswered. In fact, accumulating artifactual evidence continues to complicate these questions. For example, the vessel carried both Islamic and Byzantine coins; the glassware in her cargo was Islamic, but her cargo of wine was carried in Byzantine amphoras bearing Greek graffiti; both Islamic glass weights and Byzantine lead seals were found; and a metal bucket inscribed in Arabic lay alongside lead fishing-net weights decorated with Christian designs. Further, although some of the "domestic" pottery on board appears to be of Islamic origin, animal bones found with the pottery include those of two pigs, suggesting a Christian rather than a Moslem diet.<sup>12</sup>

In this problematical area the gaming pieces offer the potential for insight which carries beyond their recreational use. As artifacts, they provide important information concerning the ship that carried them. The presence of simply-made gaming pieces of little sales value in a specific area of the shipwreck, for example, may reasonably suggest the probable use of that area as living quarters rather than cargo space. Further, as objects manufactured at a specific time, and within a specific cultural setting, the pieces can tell us

something of the society in which they were produced. As personal possessions, probably made by their owner in shapes conforming to an established pattern, they provide potential for a better understanding of the individual who owned them. To gain some understanding of at least one member of the crew is to begin to understand better the story of the ship and the society in which it functioned.

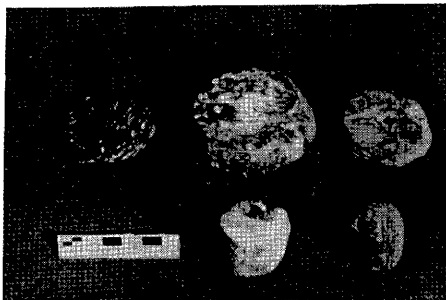
Beyond the potential for cultural insight, the gaming pieces bring into focus the human aspect of this shipwreck, a personal element which perhaps cannot be seen as obviously or clearly in any other artifacts from the site. The gaming pieces are entirely non-utilitarian. In them we find the setting aside of daily duties and responsibilities, the completing or suspending of the routine of working, eating and sleeping. We see crew members gathering around a playing surface to lose themselves in the diversion of recreation. This recreation took the form of games which are still popular, almost a thousand years after the shipwreck occurred. A direct link is established between the present and this 11th-century vessel. Almost inevitably, we begin to develop an interest in these seafarers as individuals. The shipwreck becomes less of an ancient maritime commercial accident, more of a timeless personal tragedy - an involving story of a small merchant trader and the crew

## CHAPTER II

## DISCUSSION

In a seminar on medieval seafaring at Texas A&M University, I was given several artifact photographs, including two of groups of unidentified small wood pieces from the Glass Wreck site. As a seminar assignment, I was to attempt to identify or determine the use or uses of the objects in the photographs. One photograph (ill. 5) included three flat pieces and two dowel-like pieces. Another (ill. 6) was of two small pieces originally described as "wooden chimneys."<sup>13</sup>

In the course of analyzing photographs of a different group of artifacts from the wreck, including spindle whorls and combs, my attention was directed to the activities of women in the medieval period. During this research I noted the publication of an ivory relief depicting women playing chess.<sup>14</sup> Although the gaming pieces shown were small, the clefts in several of the pieces resembled the bifurcations in the "wooden chimneys." Subsequent research on chess and chess pieces led me to conclude that the "chimneys" of the second photograph were, in fact, chess rooks from a set of Islamic design. The similarity of the Serçe Limani "chimneys" to the Adelshofen pieces dated to the 8th or



Ill. 5. Photograph of unidentified objects from Glass Wreck used in Medieval Seafaring seminar. The two bottom objects have been identified as Islamic chessmen. (Photo by D. Frey)



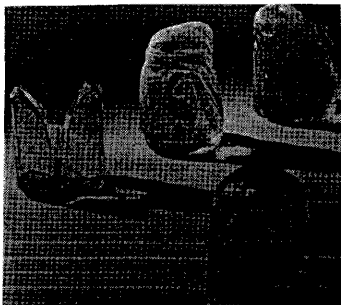
Ill. 6. Photograph of two unidentified objects from the Glass Wreck used in Medieval Seafaring seminar. The objects have been identified as Islamic chessmen. (Photo by D. Frey)

9th century (ill. 7), the Osnabruck pieces dated to the 9th or 10th century (ill. 8), and the Nishapur pieces dated to the 9th century (ill. 9) was striking.<sup>15</sup> The shapes of the other pieces in these published 8th-, 9th- and 10th-century sets made it clear that the two dowel-like objects in the first photograph also were chess pieces. In the lower center there seemed to be a king or queen, shown unfortunately from the rear, but with its diagnostic front section seen in silhouette by the shadow it cast. The piece in the lower right resembled a knight. Because of the positioning of the pieces in the photograph, and the poorly defined shape of the knight, these later identifications were less obvious but still quite certain.

In 1979, as a result of these findings, I undertook a re-examination of all wood pieces and wood fragments from the wreck site stored in the Bodrum Museum of Underwater Archaeology in Turkey. Initially, I searched through all the material in the main storage/conservation rooms of the museum. Here dozens of containers holding small, unidentified wooden pieces were examined. These small scraps had been kept in primary storage because of their potential value in the ultimate reconstruction of the ship in the Bodrum Museum. All at some point would be considered in terms of the likelihood of their being small



- Ill. 7. 8th or 9th century Adelshofen chess pieces. Top: knight, queen, king. Bottom: rook, bishop. (From L. Graham, Chess Sets [New York 1968] 10)



- Ill. 8. 9th or 10th century Osnabruck chess pieces. Rook, knight, king, with bishop in foreground. (From H. Wichmann and S. Wichmann, Chess [New York 1960] pl.7)



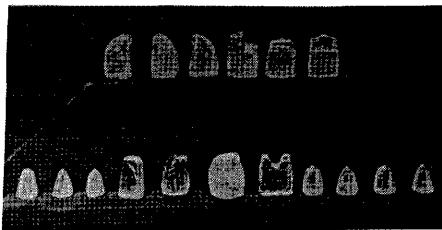
Ill. 9. 9th century chessmen from Nishapur.  
 Top: pawn, knight, rook, pawn.  
 Middle: rook, bishop, bishop, rook.  
 Bottom: king, queen, queen, rook.  
 From at least two different sets.  
 (From C.K. Wilkinson, "Chessmen  
 and Chess," Metropolitan Museum of  
 Art Bulletin (1943) 6)



pieces of hull and rigging material. My search through these containers proved most productive, for I very quickly found a king or queen and three pawns. There was some initial confusion concerning the king or queen. It was first thought that this was the king or queen shown in one of the original photographs at Texas A&M University. I later established that it was, in fact, a totally different piece.<sup>16</sup> The pawns also were identified by means of published parallels, in this case primarily those from 9th-century Nishapur in Iran (ill. 9 [p. 14]),<sup>17</sup> and the 11th-century Diocesano pieces (ill. 10).<sup>18</sup> Only one pawn retained a considerable degree of its original shape; the other two were much more badly worn, but were clearly identifiable when viewed in conjunction with the best preserved pawn.

After all items in the primary storage area had been examined carefully, numerous five-gallon pails of wooden fragments in a larger, secondary storage area were investigated thoroughly. No new chess pieces were found.

Ultimately, after all site materials had been examined, eight chessmen had been located, including those photographed in earlier years: one king (based on relative size in comparison to the queen (see Chapter III), one queen, two rooks, one knight, and three pawns. The only piece not represented in the set was a bishop



Ill. 10. 11th century Diocesan chess pieces.  
Bottom: first three and last four  
pieces are pawns. (From H. Golombek,  
Chess: A History [New York 1975] 51)

(see Chapter III).

The single tableman gaming piece from the Glass Wreck was identified as such almost immediately after its excavation, being referred to in preliminary notes as "like a backgammon or checker piece."<sup>19</sup> My research simply confirmed this early hypothesis, suggesting that the tableman was most probably used in the game of backgammon. The decorative grooves cut into the top and sides of the tableman make it easily identifiable as a separate, distinguishable object. During the course of my search for chessmen, I kept a close watch for any additional tablemen as well. None were found.

A bronze cube originally was included in the category of gaming pieces because of its similarity to a die, like those still used in games of chance. This resemblance was based on the size and shape of the object and the presence of a series of small holes or "pips" on each surface. I now believe that this cube is not a die but almost certainly a weight. No other objects resembling the cube were found during the search of site materials.

## CHAPTER III

## CATALOG

Chessmen

All of the chessmen are made of wood, most probably red oak.<sup>20</sup> The wood grain in all pieces runs from top to bottom. All are of natural color, but water-darkened. There are no apparent traces of paint, but at the time the ship sank it is likely that the men were of two contrasting colors, to differentiate between the two opposing sides. The colors involved may well have been red and black or perhaps red and green, the colors most often referred to in early Arabic manuscripts.<sup>21</sup> Given the simplicity of the set it also seems reasonable that one group of men may have been left the natural color of the wood while the other perhaps was dyed black or red.<sup>22</sup>

The shapes of the Serçe Limani chessmen, so different from those seen in modern chess sets, deserve an explanation. The men undoubtedly were carved and shaped fairly quickly, probably with materials at hand. Perhaps they were made by a member of the crew who used scrap wood from the shipyard where the vessel was constructed.<sup>23</sup> A knife or simple carving tool and a small file appear to have been the only tools used.<sup>24</sup> The shapes of the pieces are uncomplicated and easily carved. This simplicity of

manufacture, however, was not the most important factor determining the shapes. With chess itself under both Islamic and Byzantine clouds of religious concern, discussed in Chapter VI, the shapes of the pieces were determined by other considerations, at least for the followers of Islam. The prohibition of the creation of representative images by members of the Muslim faith has been the subject of much discussion both within and outside the society, and often is mistakenly traced to the Koran by Western scholars,<sup>25</sup> including those who write on chess.<sup>26</sup> A prohibition of images does exist, but, as with the prohibition of chess (see Chapter VI), the basis is found only in the traditions. With no direct reference in the Koran, and the need to draw on the more controversial hadith, or traditions, the nature of the prohibition is interpreted in numerous ways by various groups within Islamic society. According to strict observance of the ban, the faithful were bound from creating images of any living creatures under any circumstances. However, some Islamic jurists held the opinion that such images were permissible in certain circumstances. For example, if the images are hung on a wall or worn on a turban they are forbidden. If the reproductions are on carpets which are walked upon they are not forbidden.<sup>27</sup> There are similar variations in the degree of acceptance of the ban based on

the nature of the depiction or the circumstances surrounding it. And, in spite of all the opinions of the theologians and jurists, evidence of total disregard of the prohibition is not uncommon.<sup>28</sup> Still, it is clear that there were continuing concerns within Islamic society about creating images.

One hadith story, accepted by traditionists, brings together concerns about the playing of chess and the creating of images. The story involves Caliph Ali b. Abu Tali, son-in-law of Muhammad:

Ali once chanced to pass by some people who were playing at chess, and asked them 'What images are these upon which you are gazing so intently?', for they were quite new to him, having only lately been introduced from Persia, and the pawns were soldiers, and the Elephants and Horses were so depicted according to the custom of the Persians.<sup>29</sup>

The inference taken from this tradition is that Ali objected only to the carved chessmen and not to the game itself.<sup>30</sup>

It should be noted that there is some divergence of opinion between the two major Islamic sects on the question of images. Apparently the members of the Shiite sect consider the prohibition of images to refer only to religious idols. As a result, Shiite chess players would have had no objection to using chessmen carved in the images of living creatures. On the other hand, the members of the Sunnite sect take a stricter view

concerning the prohibition of images, a view that would have prohibited them from using any kind of representative chessmen.<sup>31</sup>

Given the demonstrated uncertainty about the use of images, and even the use of chess itself, it must have been both prudent and practical to create chessmen in the least offensive form possible. Thus, they could not be carved in the image of those creatures they were intended to represent: kings, counsellors, elephants, horses, chariots and soldiers. The abstract, non-representational shapes that resulted, which came to be used commonly in Islamic hands, are those depicted by the Serce Limani chessmen. The shipwrecked pieces, and all other similar Arab abstract pieces, apparently are carved in shapes which are representative of more realistic pieces used in the earlier Indian and Persian forms of the game (see p. 26). Unfortunately, with one possible exception, examples of such pieces do not exist.<sup>32</sup> By drawing on the one apparent early representative piece (see Shah below), and based on knowledge of who and/or what the pieces are meant to represent, some reasonable suggestions can be made concerning the origins of the shapes of our abstract pieces.

Aside from the working of the individual wood pieces to give them the basic shapes of the various chessmen they

represent, the pieces show no sign of additional carving or decoration. The erosion of the chessmen varies widely. In this catalog the terms minimal, moderate and substantial are used to indicate the relative degree of erosion on each piece. Because all pieces are eroded to some degree, the measurements given should be considered maximums, reflecting dimensions taken at the least eroded points. Any significant considerations related to erosion are discussed in the descriptions of the individual pieces. All measurements are in meters. GW numbers are the inventory numbers assigned to artifacts from the Glass Wreck. Provenience refers to grid coordinates on the archaeological plan of the site, explained below on page 54.

GW 845 Shah (now King)

Illustrations 11, 12, 13 and 14.

Height 0.038. Diameter varied originally to a maximum of 0.035. Height of seat at center approximately 0.024.

Height of seat at sides approximately 0.020.

Provenience N3 UL.

Originally this piece was very similar in form to GW 486, but somewhat larger. Conservation efforts were not successful in checking shrinkage, however, resulting in a considerable change in diameter. The height measurements appear to be similar to those taken originally. Compare





(Lot: 1908) aw 441



(Lot: 1471) aw 446



(Lot: 1727) aw 442



aw 84F



aw 84G



(Lot: 1876)  
aw 443

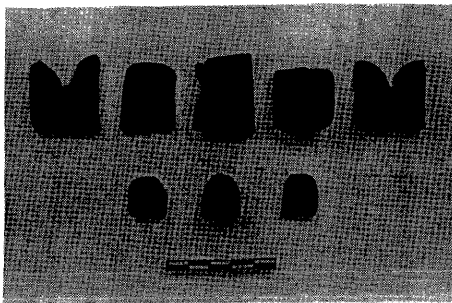


(Lot: 170 of)  
aw 448

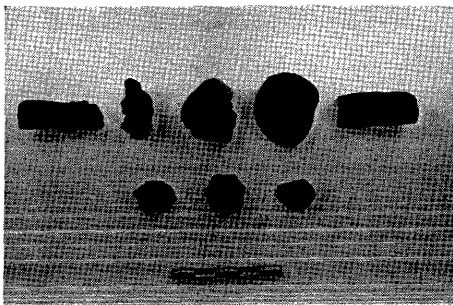


(Lot: 1890) aw 449

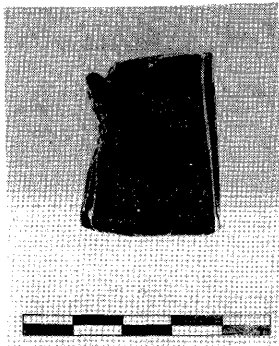
Ill. 11. The chessmen from the Glass Wreck. Top: rook, queen. Middle: rook, king, knight. Bottom: three pawns. (Drawing by N. Piercy)



Ill. 12. Glass Wreck chess pieces. Profile view. (Photo by C. Pulak)



Ill. 13. Glass Wreck chess pieces. Superior view. (Photo by C. Pulak)



Ill. 14. GW 845 - king. (Photo by C. Pulak)

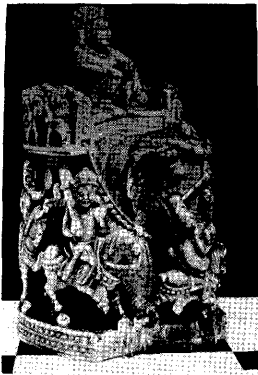
illustration 5 (p. 11) with illustration 14 (p. 25). See also illustrations 12 (p. 24) and 13 (p. 24).

A relationship can be seen between the abstract form depicted in the shipwrecked king and what is perhaps the oldest existing chess piece (ill. 15). This piece is dated most often to the 8th or 9th century and may be from either the Persian Gulf area or, more probably, India.<sup>33</sup> It depicts an elephant with a man seated on a howdah, surrounded by various figures. The relationship between the general form and shape of the piece and that of the Serçe Limani king and other contemporaneous kings (and queens) is quite clear. The upper part of the abstract form represents the howdah or throne, the lower part, the elephant. A button or protuberance on some abstract pieces, such as the Adelshofen men (ill. 7, p. 13), represents the royal rider.<sup>34</sup> These shapes also may be intended to represent thrones or very roughly blocked seated figures.

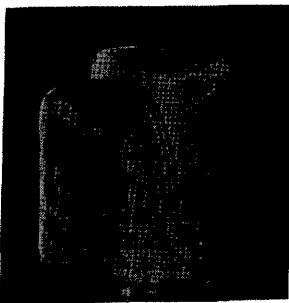
Cf. Wichmann and Wichmann, Chess, page 18 and plates 5, 6, 7, 8, 19 and 20; Golombek, Chess: A History, page 51; Wilkinson, BMAA (1943) pages 6, 7 and 10; Graham, Chess Sets, figures 12 and 13. Cf. also illustrations 7 (p. 13), 8 (p. 13), 9 (p. 14), 10 (p. 16), 16 and 17.

GW 486 Firz (Minister - now Queen)

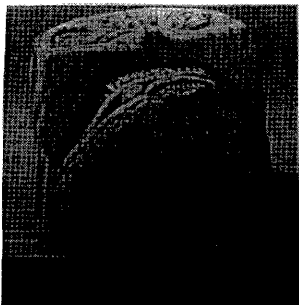
Illustrations 11 (p. 23), 12 (p. 24), 13 (p. 24) and 18.



Ill. 15. The "Charlemagne King." Perhaps  
the oldest extant chess piece.  
(From H. Wichmann and S. Wichmann,  
Chess [New York 1960] pl.1)



Ill. 16. 9th century British Museum king.  
(From H. Wichmann and S. Wichmann,  
Chess [New York 1960] pl.5)



Ill. 17. 10th century Louvre king. (From  
H. Wichmann and S. Wichmann, Chess  
[New York 1960] pl.20)

Height 0.030. Diameter varies from 0.033 to 0.029.

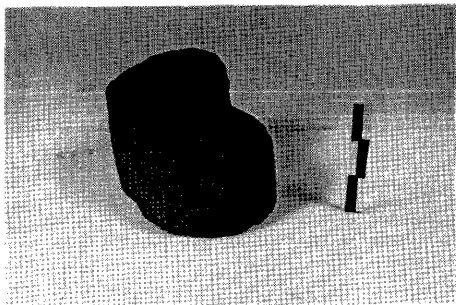
Height of seat at sides 0.018.

Provenience 05 LL (tentative).<sup>35</sup>

A short, thick, roughly cylindrical piece flattened at the bottom and top with one half of the diameter of the top section worked down into a rounded seat shape. The seat slopes down from its high middle point to end roughly half way down the overall height of the piece. Erosion is moderate to substantial, especially in the base area.

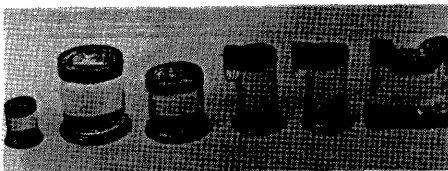
The shape of this piece parallels that of the king with the same relationship between the representational and non-representational shapes. In chessmen of Islamic design, the difference between the king and queen seems most often confined to that of size. It appears that the king is generally slightly larger than the queen. This difference can be most clearly seen in the Adelshofen pieces (ill. 7, p. 13) or in the Treasury Museum chessmen (ill. 19). It was on this size-differential basis that the Serçe Limani pieces were designated as king and queen. The designation seems reasonable, but should not be considered as certain.

Cf. parallels listed for GW 485, including illustrations 7 (p. 13), 8 (p. 13), 9 (p. 14), 10 (p. 16), 16 (p. 28) and 17 (p. 28).



Ill. 18. GW 486 - queen. (Photo by D. Frey)





Ill. 19. The Treasury Museum Pieces.  
King is second from left and  
queen is third from left.  
(From H. Wichmann and S.  
Wichmann, Chess [New York  
1960] pl. 36)

GW 484 Rukh (Chariot - now Rook)

Illustrations 11 (p. 23), 12 (p. 24), 13 (p. 24) and 20.  
Height to peak of both pinnacles 0.034. Width at base  
0.031. Thickness at base 0.017. Depth of groove between  
pinnacles 0.013.

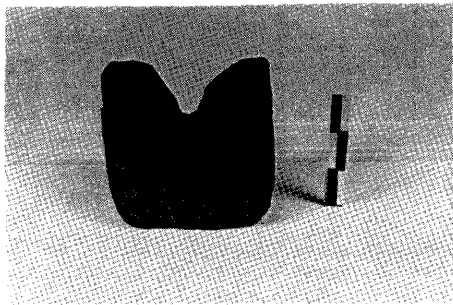
Provenience 03 LR4.

Basic rectangular shape, twice as wide as it is thick,  
with top worked down at the center in a curving diagonal  
V-shape, leaving a pinnacle on each side. The pinnacles  
are roughly the same shape and size. The center of the  
pinnacles' juncture appears to have been rounded with a  
circular filing tool. Erosion is moderate, and is most  
marked along the base.

With its deep central V-cut, the shape of this piece  
is suggested to be representative of a chariot, the  
original form the piece took. The two pinnacles formed by  
the V-cut are said to represent, in very stylized form,  
the head of the horse and the chariot driver in profile.<sup>36</sup>  
Cf. Wichmann and Wichmann, Chess, page 19 and plates 6, 7,  
10, 31 and 32; Golombek, Chess: A History, page 51;  
Wilkinson, BMMA (1943) pages 6, 7 and 10; and Graham,  
Chess Sets, figures 12 and 13. Cf. also illustrations 7  
(p. 13), 8 (p. 13), 9 (p. 14), 10 (p. 16).

GW 485 Rukh (Chariot - now Rook)

Illustrations 11 (p. 23), 12 (p. 24), 13 (p. 24) and 21.



Ill. 20. GW 484 - rook. (Photo by C. Pulak)

Height to peak of tallest pinnacle 0.037. Height to peak of second pinnacle 0.034. Width at base 0.031. Thickness at base 0.013. Depth of groove between pinnacles 0.013. Provenience P3 L11.

Shape is basically the same as that of GW 484. The pinnacles are less similar to each other in shape and size than those on GW 484. As in GW 484 the center of the juncture of the pinnacles appears to have been rounded with a circular filing tool. Erosion is moderate and is most marked along the base.

Cf. parallels listed for GW 484 above, including illustrations 7 (p. 13), 8 (p. 13), 9 (p. 14), and 10 (p. 16).

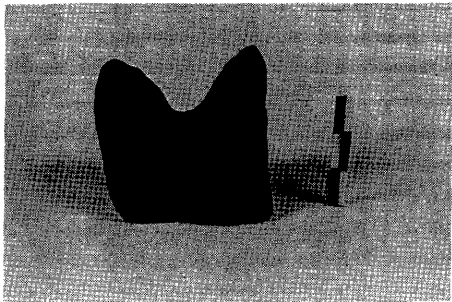
GW 846 Fara (Horse - now Knight)

Illustrations 5 (p. 11), 11 (p. 23), 12 (p. 24), 13 (p. 24), and 22.

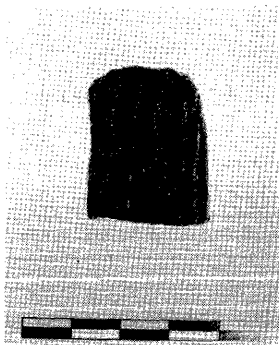
Original height approximately 0.034. Original diameter at the base varied to a maximum of approximately 0.028.

Provenience N4 UR4.

A roughly cylindrical piece, flat on the bottom and rounded off at the top. In the original photograph a rounded projection seems to appear near the top on one side. In the later drawing this probable projection can be seen as a slightly raised area close to the top of the



Ill. 21. GW 485 - rook. (Photo by C. Pulak)



Ill. 22. GW 846 - knight. (Photo by C. Pulak)

piece on one side. The original height seems to have been substantially retained, but a considerable change in the diameter has taken place. Original erosion appears to have been only moderate. Conservation treatment was not effective in checking shrinkage. Compare illustration 5 (p. 11) with illustration 22 (p. 35).

In many examples of Islamic knights, the form of the horse is reduced to a simple projection on one side of a rounded cone, no doubt intended to represent the horse's head (ills. 7 and 8 [p. 13], ills. 23, 24, 25 and 26). In the case of the Nishapur pieces (ill. 9 [p. 14]) the overall derivation of the shape from that of a horse is much more evident. The head-like projection on the Serce Limani knight is much less distinct than those seen on many contemporaneous pieces, but it is discernible in the one existing original photograph (ill. 5 [p. 11]). Cf. Wichmann and Wichmann, Chess, page 18 and plates 6, 7 and 14; Golombek, Chess: A History, page 51; Wilkinson, BMAA (1943) pages 6, 7 and 10; Graham, Chess Sets, figure 12.

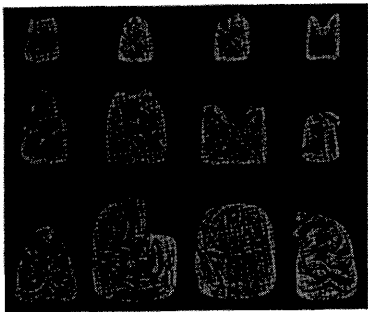
GW 487 Baidaq (Foot-soldier - now Pawn)

Illustrations 11 (p. 23), 12 (p. 24), 13 (p. 24) and 27.

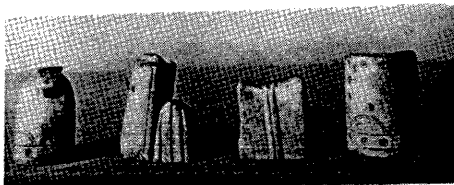
Height 0.023. Maximum diameter 0.021.

Provenience 04 UR.

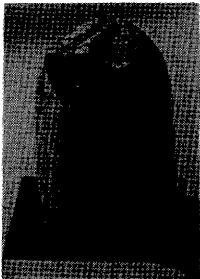
A conical piece, rounded on the top, with vertical ridges



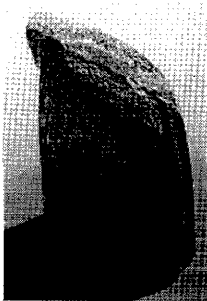
Ill. 23. 10th or 11th century Ager Chess pieces. From several sets. Top: bishop, pawn, pawn, rook. Middle: king, bishop, rook, knight. Bottom: pawn, king, queen, knight. (From C.K. Wilkinson, "Chessmen and Chess," Metropolitan Museum of Art Bulletin [1943] 7)



Ill. 24. 9th? or 12? century Cluny pieces. Knight, king, king, rook. (From D.M. Liddell, Chessmen [New York 1937] 30)

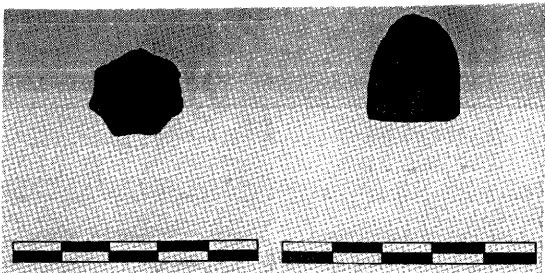


Ill. 25. 8th or 9th century Geometric knight.  
(From L. Graham, Chess Sets [New  
York] 1968] 26.)



Ill. 26. 10th century Nordic Knight. (From  
H. Wichmann and S. Wichmann, Chess  
[New York 1960] pl.13)





Ill. 27. Gw 487 - pawn. Left: superior view. Right: profile view. (Photo by C. Pulak)

running from the top to the base. The seven ridges present on the piece come together at the top. A rounded or circular filing tool may have been used to work the grooves down between the ridges. Erosion is moderate.

The pawn in the Islamic chess set appears to have been made in the simplest possible form, without any attempt at representation of a foot-soldier figure. The simple form used is that of a rounded cone, perhaps partially faceted or with ridges running from top to bottom (ill. 10 [p. 16]), or a pyramid shape, again with ridges running from top to bottom (ill. 9 [p. 14]). Cf. Golombek, Chess: A History, page 51; and Wilkinson, BMA (1943) pages 6 and 10.

GW 488 Baidaq (Foot-soldier - now Pawn)

Illustrations 11 (p. 5), 12 (p. 24), 13 (p. 24) and 28.

Height 0.019. Maximum diameter 0.019.

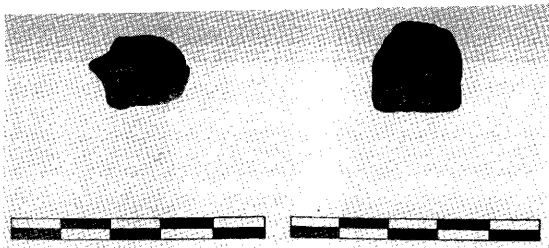
Provenience P4 LL3.

Original shape probably similar to that of GW 487. The ridges are still discernible on this piece but much less clearly defined because of a greater degree of deterioration. Erosion is substantial.

Cf. parallels listed for GW 487 above, including illustrations 9 (p. 14) and 10 (p. 16).

GW 489 Baidaq (Foot-soldier - now Pawn)

Illustrations 11 (p. 23), 12 (p. 24), 13 (p. 24) and 29.



Ill. 28. GW 488 - pawn. Left: superior view. Right: profile view. (Photo by C. Pulak)

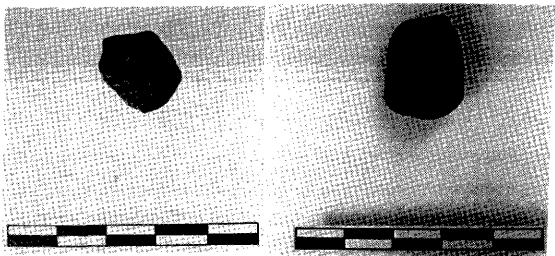
Height 0.022. Maximum diameter 0.018.

Provenience 03 LR1.

Original shape probably similar to that of GW 487. The erosion on the piece is extreme, but remnants of ridges, similar to those on GW 487, still can be discerned.

Cf. parallels listed for GW 487 above, including illustrations 9 (p. 14) and 10 (p. 16).

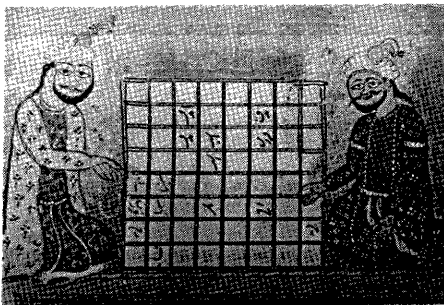
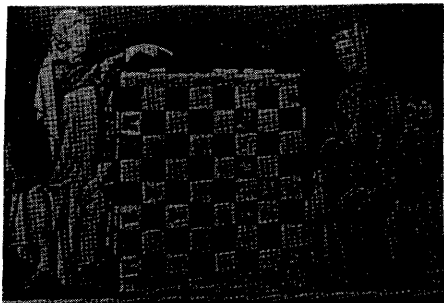
The only chessman not represented in the Glass Wreck group is the Fil (Elephant - now Bishop). The shape and appearance of the bishop in the Glass Wreck set were probably similar to those of pieces in the comparative material reproduced in illustrations 7 (p. 13), 8 (p. 13), 10 (p. 16) and 23 (p. 37). The bishops shown in the lower right of illustrations 7 and 8 probably most closely approximate the shape of the bishop missing from the Glass Wreck set. The stylizing of the elephant in the Islamic pieces is carried out primarily through the placement of two projections near the top of the piece. It is believed that these projections were meant to represent the tusks of an elephant. In different sets, these projections take the form of rounded humps (ill. 8 [p. 13]) or projecting horns (ill. 9 [p. 14]). The suggestion that the missing Serçe Limani bishop most closely resembled that of the Adelshofen bishop is based on the close relationship



Ill. 29. GW 489 - pawn. Left: superior view. Right: profile view. (Photo by C. Pulak)

evident between the Adelshofen and Serçe Limani rooks, kings and queens. The shape of this piece is important to remember in the event that it is noticed during the continuing study of artifacts and wood fragments in the Bodrum Museum, or in the event that chess pieces are uncovered in future seabed excavations.

Nor was any trace of a board or playing surface found during the excavation of the wreck. Had one been found it almost certainly would have been made up of the usual 8 X 8 arrangement of 64 squares,<sup>37</sup> but simple lines, without checkering, would have separated the squares. Checkering of playing boards was European in origin and only in very recent times has it become common in the East.<sup>38</sup> This contrast in the form of the playing surfaces can be seen clearly in the comparison of an ancient Persian treatise on chess and a 13th-century European illustration from the chess manuscript of Alfonso the Wise (ill. 30). It is probable also that the playing surface used with the Glass Wreck chessmen was made of some soft material, perhaps brocade or other rich cloth,<sup>39</sup> but more likely leather or simple cloth of some kind with the lines worked into it in a contrasting color.<sup>40</sup> The probability that the playing surface was of cloth or leather, which degrade more quickly than some woods or metals, may also be a factor in its failure to have survived on the seabed. There is



Ill. 30. Top: 13th century European chess playing surface with checkered squares. Bottom: contemporaneous Islamic chess playing surface with lines only. (From H. Golombek Chess: A History [New York 1975] 36 and 71)

interesting evidence that sailors can be unconcerned about the formal nature of playing surfaces and innovative in creating them. The excavation of a 14th-century shipwreck off the coast of Korea revealed the presence of a playing board pattern for the Chinese game of "Go" that had been hastily carved into a wooden packing crate being carried as cargo.<sup>41</sup> The head pieces of a storage barrel recovered from the 16th-century British warship Mary Rose were crudely incised with two gaming boards, one for "Nine Men's Morris," the other for an unidentified game. The Mary Rose also carried a simple chessboard with incised dimples marking alternate squares.<sup>42</sup> A similar gaming board, with a crudely carved set of lines on a rough board, was recovered from the wreck of a 16th-century Basque whaler, the San Juan. On this board, x's were simply notched in to mark the alternating squares.<sup>43</sup>

#### Tableman

GW 257 Tableman (used in Nard - now Backgammon)

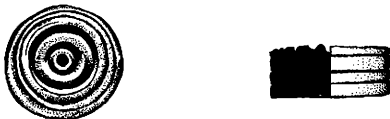
Illustrations 31 and 32.

Diameter 0.029. Thickness 0.014.

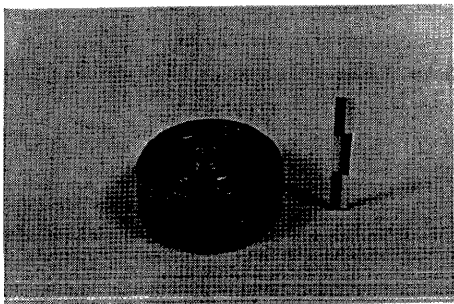
Provenience L4 LL4.

Bone. The discoid shape is very similar to that of a modern backgammon or checkers tableman. Three grooves have been cut around the outside edge of the piece and a series of four grooves form concentric rings on the top,





Ill. 31. GW 257 - tableman. Left: superior view.  
Right: profile view. (Drawings by N.  
Piercy)



Ill. 32. GW 257 - tableman. (Photo by D. Frey)

at varying distances from the center. A shallow depression 0.003 in diameter is located at the center of the top. At one point a substantial crack runs from the outside edge to within 0.005 of the center. The piece apparently was lathe-turned.

The tableman follows a standard pattern apparently used with little change or variation in backgammon through most of the game's existence.<sup>44</sup> The shape is so universal it has received little or no attention from those who have studied the game.<sup>45</sup>

"Die"

GW 490 Unidentified bronze object, probably a weight.

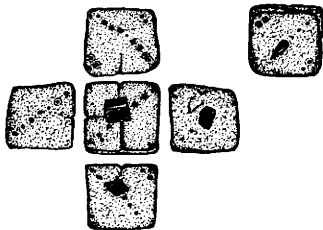
Illustrations 33 and 34.

Width/height dimensions of sides vary between a maximum of 0.020 and a minimum of 0.017.

Weight 42.6 grams.

Provenience 04 LR4.

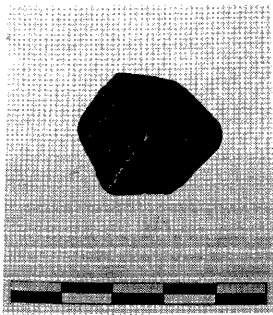
A roughly cube-shaped bronze piece with a series of small holes, similar to pips on dice, on each of six faces. The number of small holes varies from a maximum of fourteen on one face to a minimum of five on another. The holes appear to follow approximately diagonal lines across the various faces and/or to form small clusters at the corners. The holes vary slightly in depth. All holes are "bird's eyes," with a single obvious ring indentation



GW 490 (Lot: 1639-04-124)

*Nels Piercy  
Nov. '79.*

Ill. 33. GW 490 - bronze cube. Exploded view. (Drawings by N. Piercy)



Ill. 34. GW 490 - bronze cube. (Photo by D. Frey)

surrounding each hole. This ring is less obvious on the more eroded or worn surfaces. In addition to these holes, more sizeable indentations are found on four of the six sides. A roughly rectangular indentation, 0.006 along the sides and perhaps 0.003 deep, is located near the center of the widest face, perhaps the base, 0.020 wide. On this same face, grooves or cuts, apparently deliberately made, run from the middle of the outside edges, on three sides, in to the rectangular indentation in the center. Smaller and much less well-defined indentations are located on three other faces of the cube. The piece was found in a very fragmentary wooden casing with at least one almost complete side (bottom?) and remnants of at least two other sides forming a corner. The casing appeared to have been just large enough to accomodate the object itself.<sup>46</sup>

Based on the parallels cited, the chessmen identifications are clear and certain. A number of authorities have confirmed these identifications, based on their personal knowledge, or on parallels held by their institutions.<sup>47</sup>

The identification of the tableman as a gaming piece is also beyond question.<sup>48</sup> At this point there can be no certainty of the specific game in which it was used, but there is agreement that the most likely game was backgammon.<sup>49</sup>

The bronze cube is not a die. There are bronze and other dice of similar shape, including some ancient ones,<sup>50</sup> and there are exceptions to the standard 6-1, 5-2, 4-3 arrangement of pips on opposite faces, but there are no dice which carry any pattern of pips resembling that found on the Glass Wreck cube.<sup>51</sup> Although no fully acceptable parallels have been found for the cube, there is agreement that the general shape and material suggest that it is a weight of some kind.<sup>52</sup> An interesting relationship can be seen between the bronze cube and some ancient weights from North Africa. The 42.6 gram weight of the cube is the same as that of a Fatimid weight of "un okiyeh et demi,"<sup>53</sup> and is comparable to the ancient Sudanese "petit karui" weight of 42.5 grams (ill. 35)<sup>54</sup> and the North African 10 miskal weight which is close to 42.5 grams.<sup>55</sup> The weight of one ratl (an oriental unit of weight) in Egypt during the Fatimid period was 427 grams, a close multiple of 10 of the cube weight.<sup>56</sup>

There is at least one other interesting possibility concerning the weight of the cube. Copper, silver and gold coins all were used in Mediterranean commercial activities of the medieval period. In the 10th century the respective legal value between Islamic gold coins (dinar)<sup>57</sup> and silver coins (dirham) was established as 7/100, corresponding to a ratio by weight of 7:10 (4.25



Ill. 35. A series of weights from North Africa.  
(From J.F. de Rochesnard, Album des poids afriques [1978])

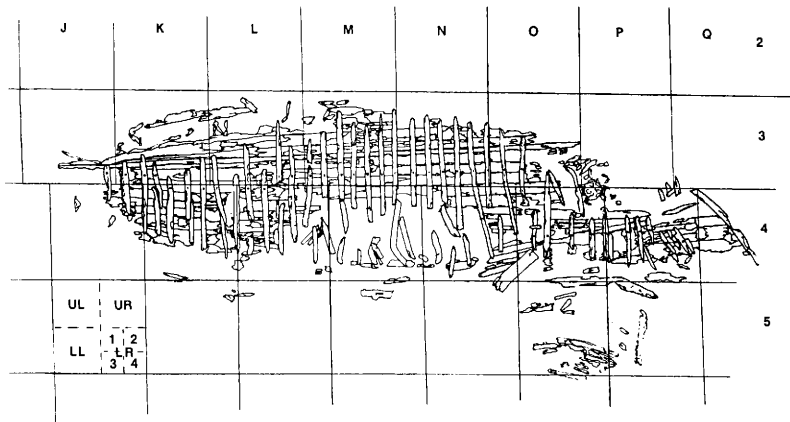
grams for the dinar and 2.87 grams for the dirham) and a gold/silver rate of exchange of 10.<sup>58</sup> The Glass Wreck cube, with a weight of 42.6 grams, represents a strikingly close multiple of 10 for the scale weight of one dinar. Thus, the cube possibly could have been a weight used to verify the coin weight, or to calculate the gold equivalent weight, of 10 dinars. This specialized use might explain the uniqueness of the cube in terms of weights found on the site and the fact that it may have been stored in a small, separate container of its own.

Other evidence concerning the identification of the bronze cube is discussed in Chapter IV.

CHAPTER IV  
DISTRIBUTION

Excavation of the Glass Wreck site was conducted with a control grid comprised of two-meter squares. These two-meter squares were further divided into one-meter squares, as shown in the lower left corner of illustration 36 (UL = upper left, UR = upper right, LL = lower left, and LR = lower right), and these squares were then sub-divided, by the eye of the excavator, into fifty-centimeter theoretical squares designated 1, 2, 3, and 4, as shown in illustration 36. Illustration 37 shows the actual metal grid in place. The squares allowed excavators to record the location of each object within a fifty-centimeter-square area of the site. Ultimately, the theoretical grid plan covered a minimum of one hundred and eight square meters of the seabed. Most of the site lay in an area of gently sloping, deep sand. However, a large outcropping of bedrock at one end of the site made it impossible to position the rigid grid properly in that area, forcing the upper section of the grid to be offset, along its length, by fifty centimeters from the remainder of the grid.<sup>59</sup> The recording of the location of objects in relation to the grid system was the primary source of provenience information.





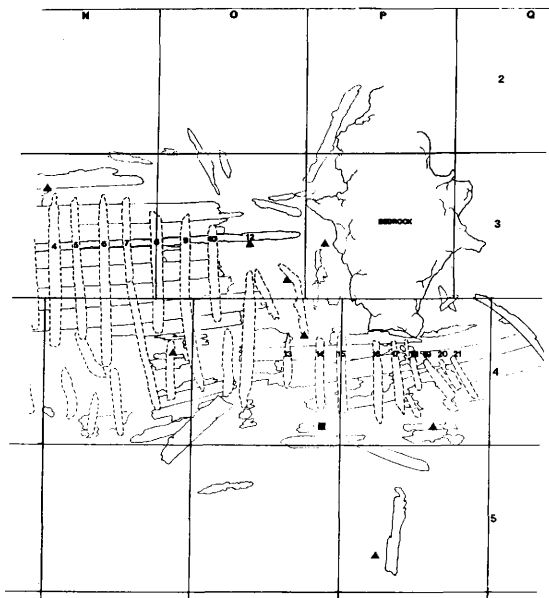
Ill. 36. Glass Wreck grid plan. Section J5 illustrates theoretical one meter and fifty centimeter sub-divisions.



Ill. 37. Glass Wreck site with portion of rigid metal grid in place. (Photo by Institute of Nautical Archaeology staff)

From this information, it is evident that the chess set was stored, or at least abandoned, in the stern section of the ship. The king (GW 845) was found in area N3 UL, the queen (GW 486) apparently came from area 05 LL, the rooks were found respectively in 03 LR4 (GW 484) and P3 LL1 (GW 485), the knight (GW 846) came from N4 UR4, and the pawns from 04 UR (GW 487), P4 LL3 (GW 488) and 03 LR1 (GW 489) (ill. 38). Four chessmen (two rooks and two pawns) were found within a meter-and-a-half-square area at the stern. The other four were all located in site squares adjacent to those of the more closely clustered four, the remaining pawn and the knight in closer proximity, the king and the queen somewhat more removed. Although the queen was located further downslope on the site, it is still clearly from the stern. The king was located in an area approaching midships, but not so far distant as to disallow a reasonable association with the other pieces.

Given the location of seven of the eight chessmen toward the stern, it is reasonable to assume that they were stored in that area when the ship went down. It is logical to suggest that a full set was on board at the time of the sinking. The surviving pieces apparently were trapped under objects, or in some other fashion were prevented from floating free. The remainder of the pieces



111. 38. Stern section of site plan showing distribution of chess pieces and bronze cube.

▲ Chess pieces.

■ Bronze Cube.

could have been lost during the sinking or at some point before they became waterlogged. Individual pieces may also have ended up in exposed areas of the wreck and simply disintegrated over time. There is the possibility that some pieces were overlooked by the excavators. With the volume of wood on the site, and the small size and generally undiagnostic shapes of the pieces, some might easily have been fanned away with other site debris, especially as not all tiny fragments of wood were retrieved. However, the fact that eight chessmen, including two badly eroded pawns (GW 488 and GW 489) of virtually indiscernible shape, were recovered from the site suggests it is unlikely that the other twenty-four would have been missed by excavators. All of this, of course, reinforces the need for the recovery of every fragment of material from archaeological sites.

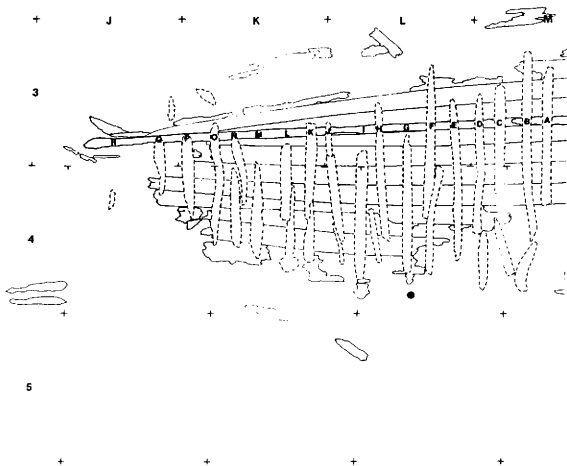
Although the chess pieces were found, for the most part, in fairly close proximity to each other, it would seem that they would have been clustered even more tightly, in a very restricted area, if they had been stored together in some kind of container. In that case, we also might expect to have found a complete set. As this is not the case, an examination of some of the other possibilities may prove useful. It is possible, for example, that more than one chess set was on board. The

location of the pieces relatively close to each other, the lack of any redundant pieces among those found (e.g., five rooks would indicate more than one set), and the obvious similarity in size and form of the men argue against more than one set. Another possibility is that the set was not in storage but was in use when the ship met her fate and, during unusual or violent movement during the sinking, some pieces were trapped and carried to the bottom while others were washed away or floated free. There is some evidence to suggest the crew may have been caught unawares at the time of the sinking.<sup>60</sup> However, it is unlikely, under any circumstances, that the crew were involved in playing games just as they were approaching or leaving their anchorage in the harbor. Another possibility could involve the presence of a deck, or a portion of a deck, on the vessel. If the chessmen were stored loosely in some area beneath a deck, it is possible that some eventually floated out through open hatches or undecked areas while others floated up to the underside of the deck but remained trapped beneath it. In this case they might have dispersed, in a pattern similar to the one seen on the site, before becoming waterlogged and dropping away from the deck to the hull beneath. Only fragmentary evidence of a deck has been found, but that is not unusual in shipwreck sites because marine borers quickly devour the

exposed, upper parts of sunken ships.

Other scenarios could be developed concerning the distribution of the chessmen on the site, but all such possibilities need the support of new information. Barring any such information, the available evidence can only suggest that some pieces were trapped in the wreck and eventually covered by a protective blanket of sand while others simply floated free or were left exposed and slowly disintegrated.

Provenience information indicates that tableman GW 257 was found in L4 LL4, an area in the midship section of the ship (ill. 39). The distinctive physical appearance of the tableman makes it even more unlikely than in the case of the chessmen that the excavators missed any or all of the remaining pieces. Since bone does not float we are left with the most probable explanation that this gaming piece was separated from its set (perhaps well in advance of the sinking), became lodged in an area where it could not be seen or reached, and eventually was covered by a protective mantle of sand. It is not unheard of for single pieces to be separated from their sets on shipwrecks; the Tudor warship Mary Rose yielded a backgammon board with several counters, but only a single domino.<sup>61</sup> With only one tableman recovered at Serce Limani, it is more difficult to make any deductions



Ill. 39. Forward and midships section of site plan showing location of tableman.

● Tableman.



concerning the location in which it was found. It is reasonable to suggest, however, that the game involved may have been used and/or stored in the midship section of the vessel. Since just one tableman was found, it is possible that a full set was not on the ship at the time of the sinking.

Bronze cube GW 490 was found on the site in area O4 LR4 (ill. 38 on p. 58). Because bronze is relatively impervious to the deteriorating action which affects most objects placed in an underwater environment,<sup>62</sup> the cube has survived for centuries on the seabed in excellent condition. The same holds true for a number of other small bronze objects recovered from the site, many of them from areas close to the cube.<sup>63</sup> Its find location places the cube in the stern section of the ship, in reasonable proximity to seven of the eight chess pieces, but considerably removed from the tableman. Although the point is no longer in question, it is worth noting that a closer association with the tableman rather than with the chess pieces would have been more supportive of the suggestion that the cube is a die. Dice would have been used with the backgammon piece but not with the chessmen.<sup>64</sup> Other elements in O4 LR4 are of interest in consideration of the identification of the cube. In the same area are found four brass weights, seven glass

weights, a lead counterbalance, a jeweller's scale and other material related to the commercial activities of the ship.<sup>65</sup> This evidence supports the suggestion that the cube is a weight, as described in Chapter III.

If we return to the chessmen and tableman, there is a further point of interest concerning their distribution on the wreck. It is well established that the captain and other officers almost always have quarters in the stern of any ship. Regular crew members are more likely to be quartered in the forward section of a vessel. There is little question that this was the case during all periods of maritime activity and, undoubtedly, was the case for the crew of the 11th-century ship that sank at Serçe Limani. We know that passengers regularly travelled by ship during the medieval period,<sup>66</sup> but their living and sleeping arrangements on small vessels are not clearly understood. Evidence from later periods indicates that some passengers did have stern quarters on a similar vessel in a similar situation.<sup>67</sup> Thus, although the chessmen were most likely the possessions of the ship's master or an officer, they could have belonged to a passenger. The backgammon piece, found well beyond midships, is more likely to have been the possession of a regular crew member.

To a large degree, chess has the reputation of having

been a game of the upper classes during the medieval period.<sup>68</sup> Because the nationality or nationalities of crew and passengers on the Serçe Limani ship have yet to be determined, this should be examined from both Western and Eastern points of view. There is some considerable evidence to demonstrate it was the case in medieval Europe.<sup>69</sup> It was not until the 15th century in Europe that chess definitely moved downward from the upper classes, and even at that time there is conflicting evidence about any widespread playing of the game by the lower classes.<sup>70</sup>

In the Islamic world, as elsewhere, chess at first was in the hands of the ruling classes (see Chapter V). There is some evidence that in Islamic society it continued to be primarily the game of the privileged for a considerable period of time after its introduction.<sup>71</sup> Even in more recent times, in at least some segments of Islamic society, the game has been considered to be of interest to only a small proportion of the better educated.<sup>72</sup> In the works of Islamic writers of the 10th and 11th centuries, there is also evidence of social distinctions made between the playing of chess and the playing of backgammon,<sup>73</sup> implying a skill and intelligence advantage for the chess player.<sup>74</sup> Although the Serçe Limani vessel probably was only a typical, modest

merchantman,<sup>75</sup> there was surely at least some social distance between the master and his crew. It is reasonable to say, therefore, that the captain of the ship was the more likely candidate as possessor of the chessmen, while the more probable owner of the backgammon tableman was a member of the crew, a conclusion reached independently from an analysis of the find spots of the pieces on the wreck.

On this same point, the presence of the chessmen on the Glass Wreck provides potential insight for chess historians. It is possible that the master of this simple merchantman played chess, probably with a subordinate, using very plain, hand-carved, wooden chessmen. If this is the case, it suggests a widespread knowledge of the game at a relatively low level of 11th-century society.

In summation, evidence from the distribution of the gaming pieces on the site at the very least supports the probability that the chessmen were owned by a ship's officer and that chess was played in the stern of the ship; the same evidence suggests that the backgammon piece was probably the possession of a crew member or passenger who played amidships. Distribution patterns also support the suggestion that the bronze cube is a weight rather than a die.

CHAPTER V  
THE ORIGINS AND DIFFUSION OF CHESS  
AND BACKGAMMON

If the gaming pieces found at Serçe Limani are to imply the nationality or nationalities of at least those who used them on board, we should understand something of the histories of the games involved.

Chess

Although chess has been the subject of considerable scholarly investigation, the origin of the game remains obscure. In fact, very little is known of the game during the first two centuries of its existence. In his exhaustive, landmark work, A History of Chess,<sup>76</sup> H.J.R. Murray demonstrated that the precise time and accurate details of the beginning of chess probably are impossible to determine. Virtually all other chess scholars agree.<sup>77</sup> Nevertheless, based on literary references to the game, studies of the ancient and modern names of pieces, and some limited archaeological evidence, widespread agreement has been reached on many general points concerning the invention, evolution, and diffusion of chess.

Evidence in the form of boards and playing pieces for various types of games other than chess has been recorded

from sites of great antiquity, some as early as the 4th millennium B.C. in pre-dynastic Egypt.<sup>78</sup> Generally, however, there is considered to be no direct relationship between chess and these ancient games or any of the various other games invented and played up to the fifth century of our era.<sup>79</sup> For the most part, these are games of chance, usually quite elementary, involving a roll of the dice or the luck of the draw. Chance is not a factor in chess. Chess is a much more involved, complex and scientific game, requiring considerable skill, expertise and experience for successful play. This is the primary distinction which scholars agree separates chess from the vast majority of games which preceded it in time.

Those who have studied the subject most closely agree that chess originated somewhere in the northwest area of India, probably at some time between A.D. 450 and A.D. 550.<sup>80</sup> The game spread eastward from India relatively quickly, moving into China before the end of the 8th century, then on to Korea and Japan by the eleventh century.<sup>81</sup> The westward movement of chess was even more rapid. The game reached Persia before the end of the 6th century and, in the first half of the 7th century, the conquest of Persia brought chess into the hands of the Islamic peoples.<sup>82</sup> In the course of the subsequent rapid Islamic expansion, the game moved into Europe via the

south shore of the Mediterranean.<sup>83</sup> By 1100 chess had reached virtually all of Western Europe, travelling into England with the Normans.<sup>84</sup> The route by which chess moved northward from India to the Siberian peoples - perhaps northward from Persia - is uncertain, but it is clear that by the 11th century chess was firmly established in this northern area as well.<sup>85</sup>

Although variations had been introduced in several countries, by the beginning of the 12th century, chess, in some form, was being played in Iceland, the Phillipines, and virtually everywhere in between.

Evidence for the origin and the first two centuries of diffusion of chess is based solely on literary and philological information. There are no chess pieces from the 6th or 7th centuries A.D. Even the literary references throughout these first two centuries are extremely rare. The earliest reference is found in the Karnamak-i- Artakshatri-Papakan, a Persian romance based on the life of Artakshir, son of Papak, the founder of the Persian Sassanian Dynasty (A.D. 224-651).<sup>86</sup> This work is dated to around 600<sup>87</sup> and is important not only for its early reference to chess but for the nature of that reference:

When Ardavan saw Artakshir, he rejoiced and esteemed him highly. He commanded him to accompany his sons and knights to the close and to the games

of ball. Artakshir did this and by God's help he became doughtier and more skilled than them all in horsemanship, in chess, in hunting and in other accomplishments.<sup>88</sup>

This reference demonstrates that by A.D. 600 chess was not only fairly generally known in Persia, but also was accepted as a game in which a national hero characteristically was expected to excel.

Chronologically, the next literary references to chess are generally believed to be found in Sanskrit literature, beginning in the 7th century. Although some of the early ones are considered to be less than certain allusions to chess, at least two generally are accepted as definite references to chess.<sup>89</sup> The first of these is in Subandhu's Vasavaddata, a prose romance from the beginning of the 7th century, in which he describes the rainy season:

"The time of the rain played its games with frogs for chessmen which, yellow and green in color, as if mottled with lac, leapt up on the black field of (garden bed) squares..."<sup>90</sup>

The next generally accepted Sanskrit reference to chess is from a work called the Harshacharita by Banu. Here Banu, in an account of Sriharsha the supreme ruler of Northern India from A.D. 606 to 648, describes the peace and good order of the realm:

"...under this monarch...only bees quarrel in



collecting dews; the only feet cut off are those in metre; only ashtapadas (game boards) teach the position of the chaturanga (Indian chess)..."<sup>91</sup>

As with the Persian Karnamak, these Indian 7th-century references support the generally accepted dating and location of the origin of chess.<sup>92</sup> The Karnamak is especially important in this respect because the Persians clearly acknowledge that their Indian neighbors were playing the game first and the Persians learned it from them.<sup>93</sup>

Although much less precisely dated than the Karnamak, another Persian romance, Chatrang-namak, contains the next known literary reference to chess. Dated sometime after 650, this work discusses the introduction of chess into Persia in the period 531-578<sup>94</sup> during the reign of Nushirwan I (Khusrow I Anushak-rubano).<sup>95</sup>

The first references to chess in Arab writings are found in poems by Kutaiyiru Azzata and al-Farazzdaq, both from the first quarter of the 8th century.<sup>96</sup> Unlike the much more important later works in Arabic, these first references essentially are made in passing. Two mid- to late-9th-century Sanskrit poems by Kashmir authors, Haravijaya by Ratnakara and Kavyalankara by Rudrata, make clear references to chess, but convey little or no information concerning the character of the game itself.<sup>97</sup>

Fortunately, during this same period, and perhaps a little earlier, Arab writers were beginning the vast range of literary works on chess which were to flower during the two centuries of the Abbassid period (ca. 800 to 1000) and continue well beyond. Works by chess masters al-Adli (flourit ca. 850), and as-Suli (flourit 900), and other contemporary masters and chess writers, provide accounts of not only chess activities and the events surrounding them, but also the underlying principles of chess moves. These works signal the beginnings of the scientific study of the game itself. They also provide important information on chess in other countries. In a note which was probably part of his last work on chess, al-Adli gives the only existing detailed account of how the game was played in India in the mid-9th century.<sup>98</sup> A later Arab account (A.D. 1030) by al-Beruni, titled India, discusses the religion, philosophy, literature, laws and other aspects of Indian life, including the game of chess.<sup>99</sup> Again, from this Arab writer we receive the only available details of the manner in which chess was played in India in the early 11th century.<sup>100</sup>

The Arab historian al-Tabari provides the earliest evidence of Byzantine knowledge of chess. In a document written sometime after A.D. 850, he relates a story which indicates awareness of the game in Byzantine ruling

circles by A.D. 802:

It is related that when Niqfur (Nicephorus) was king and the Byzantines had assembled in allegiance to him, he wrote to ar-Rashid: "from Niqfur, King of Byzantines, to Harun, King of the Arabs, now the Empress to whom I have succeeded estimated you as of the rank of the Rook, and estimated herself as of the rank of the Pawn, and paid tribute to you...<sup>101</sup>

The reference is an important one since we find no mention of chess in Byzantine literature itself until much later.<sup>102</sup>

One of the most important later literary references to chess is found in Shanama, the national epic of Persia. In this work by Abu al-Qasir Masur Firdawsi, finished in 1011, the legend of the Persian participation in the Indian invention of chess is set forth in great detail. This work, undoubtedly, is the basis for most of the myths surrounding the invention of chess. As in the Persian romance Chatrang-namak, the invention of the game is attributed to the period of the reign of Nushirwan I (531-578).<sup>103</sup>

Perhaps the most famous of all literary references to chess also comes from Persia in the 11th century. In what has become a common literary occurrence, Omar Khayyam, in his Rubaiyat, used chess as a parallel for life:

"Tis all a Chequer-board of Nights and Days  
Where destiny with Men for Pieces plays;  
Hither and thither, moves and mates and slays

And one by one back in the Closet lays."<sup>104</sup>

Aside from the Indian-Persian-Arab sources, there are few, if any, important early references to chess. Not until the 11th century do clear references begin to occur to the east, in China and beyond, and to the west in Spain and Italy. And it is the middle of the 12th century before we find the first reference to chess in a Byzantine source.<sup>105</sup> In the twelfth book of her Alexiad, the Princess Anna Comnena recounts some of the activities of her father, Emperor Alexis Comnenus:

"He had certain familiar friends with him with whom he played chess, a game that was discovered in the luxury of the Assyrians, and was brought to us."<sup>106</sup>

In consideration of Byzantine knowledge of chess, it should be noted that, in addition to the much earlier Arab literary reference to Nicephorus's awareness of the game, there is some supporting philological evidence. It has been established that chess made its appearance in the Byzantine Greek language under the name zatrikion. The evidence points to the use of this word beginning no later than the 9th century A.D., since it is closer to the early Persian name for the game than to the later Arabic term. There is no evidence in contemporaneous Greek records to show use of the word zatrikion prior to the 9th century.<sup>107</sup> Thus, while there are no Byzantine literary

references to chess until the 12th century, the Byzantines were at least aware of the existence of the game at a much earlier time.

Turning to archaeological evidence related to the origin and diffusion of chess, we find that from the first two hundred years of probable chess existence (6th and 7th centuries) there are no known and generally accepted chess pieces.<sup>108</sup> Examples of chessmen from the following three centuries (8th, 9th and 10th) are also very rare. Most of the major chess publications<sup>109</sup> indicate knowledge of only about a dozen individual pieces or groups of pieces from these three centuries: four individual pieces and two other groups of pieces dated to the 8th or 9th century; two groups of pieces from the 9th or 10th century; two individual pieces and one group of pieces from the 10th century; and one group of pieces dated to the 10th or 11th century. Beyond these, the remainder of the known early chessmen are dated to the 11th century and later.

Of these early finds, only three partial sets are dated by any type of archaeological context. The Nishapur men, excavated by C.K. Wilkinson in 1943 at Nishapur in Persia (Iran) were found "in a house of the early 9th century."<sup>110</sup> The Qasr al-Hayr rooks were found in a 9th-century context at a site in Syria.<sup>111</sup> One other group of men came from an early 20th-century

archaeological excavation at Dorset,<sup>112</sup> "found...together with metal objects that are attributed to the second half of the 12th century...",<sup>113</sup> but dated in more recent works to the 10th century on the basis of a fragmentary inscription on one piece.<sup>114</sup>

All of the other early pieces found have been dated by style and decoration, including two other partial sets and one other piece found in the ground in various types of diggings.<sup>115</sup> The dates for these other early finds are always given with at least one or two century parameters and are sometimes contradictory and often open to question.<sup>116</sup> For example, one large piece (perhaps the oldest chess piece in existence) is dated most often to the 8th or 9th century, but, in at least one case, as late as the 16th century.<sup>117</sup> With this piece there is even considerable disagreement on whether it is in fact a chess piece at all.<sup>118</sup> A knight in the Musée du Louvre in Paris is dated by the Museum to the 12th century,<sup>119</sup> whereas some recent authorities suggest the 8th or 9th century as a better possibility.<sup>120</sup> A bishop in the Metropolitan Museum of Art in New York is dated by the Museum to the 12th century,<sup>121</sup> whereas in at least one other place it is dated to the 8th century.<sup>122</sup> Again, virtually all dates given are within only one or two hundred year parameters, even in the case of those archaeologically excavated.

Similarly, the place of manufacture or origin for most pieces discussed has been determined by style and decoration, and these determinations are often equally contradictory.<sup>123</sup>

At least twenty individual and groups of chessmen appear to be widely accepted as being from the 11th century. Of these pieces, only one partial set came from an archaeological excavation (at Bam-ka-thul) and its date is most commonly set as early in the 11th century.<sup>124</sup> The chessmen dated to the 11th century include representative pieces from ten or eleven rock crystal sets.<sup>125</sup> At least two of these have been referred to in written documents of their period: the Ager Pieces, willed to the Abbey at Ager in Spain by the Count of Urgel in A.D. 1010, and pieces at San Millar de la Cozolla in Spain, discussed in a work order from King Sandro the Great of Navarra (1000-1035).<sup>126</sup> A will noting a second gift of a rock crystal set from Countess Ermissind (sister-in-law to the Count of Urgel above) to the church in 1058 may or may not refer to the same set.<sup>127</sup> The remainder of the rock crystal groups and others dated to the 11th century have been dated by style and decoration only. For those dated to the 11th century there are considerably fewer contradictory dates, although some do continue to appear.<sup>128</sup>

Individual and groups of chessmen dated to the 12th and 13th centuries are more common than during earlier centuries. However, of the dozens of most commonly published individual and group pieces from this later period, there is no indication that any were found in an archaeological context, and all are dated by style and decoration alone. Again, the dates are usually only to a given century and remain sometimes contradictory.<sup>129</sup>

In our examination of the evidence concerning the diffusion of chess, especially its extent during the period in which the Serçe Limani ship sailed, archaeological evidence is of little help. However, from the excavated sites of Nishapur and Qasr al-Hayr, archaeology does provide two examples of chess pieces in the hands of Islamic peoples in the 9th century, two centuries before the sinking of the vessel. In both cases the pieces are clear parallels to chessmen from the Glass Wreck. There are no chess pieces from the period of the ship's sinking that have been identified as being Byzantine in origin.

Both literary and archaeological evidence for the diffusion of chess suggest, therefore, that it is more likely than not that the owner of the Glass Wreck chessmen was either from, or intimately associated with, Islamic society.<sup>130</sup>



### Backgammon

The origin and diffusion of backgammon is somewhat less clouded than that of chess but it remains a complex subject. Backgammon clearly is an older game than chess. In some form, it was known to both Greek and Arab societies for centuries before the sinking of the Glass Wreck. However, a brief examination of its history is of interest since there is evidence that backgammon reached Byzantine and Islamic societies by different routes and was played in a slightly different form in the two cultures.

As discussed above, perhaps the most ancient of all gaming boards came from the 4th-millennium B.C., pre-dynastic tomb at El-Mahasna in Egypt. It is possible that the clay board and the pieces found may have been used for divination purposes, but they incorporate the idea of moving men in a pattern of squares, which is fundamental to all board games.<sup>131</sup> In the First Dynasty Royal Tombs at Ur, of the 3rd millennium B.C., a number of gaming boards were located.<sup>132</sup> Later gaming boards which appear to have been based on those from Ur were found in Egyptian tombs. One of these boards is thought to have belonged to Queen Hatshepsut, in the middle of the 2nd millennium B.C.<sup>133</sup> Attempts have been made to connect these and other ancient games with backgammon, but no

rules of play have survived (or yet been discovered), so such attempts generally have been discounted. However, on the underside of the Hatshepsut board (actually a long box with playing pieces inside) another board was found which is considered to be from an early backgammon-type race game.<sup>134</sup> This game has come to be called "the game of thirty squares," and involves many of the basic principles of play of backgammon and the use of throwing sticks or knucklebones, two early forms of dice. This game may have been the basis for the Roman game of ludus duodecim scriptorum (XII scripta).<sup>135</sup> In turn, ludus duodecim scriptorum generally is considered to be an early form of the Roman game of tabula which was very popular from the 1st to the 7th century.<sup>136</sup> Tabula, or alea as it often was called, is considered to have been a well-developed form of backgammon.<sup>137</sup>

The evidence concerning early Greek games is very confused and there is nothing which clearly establishes a link between such games and a true form of backgammon.<sup>138</sup> However, by the 6th century A.D., Greeks knew of the game of tabula, undoubtedly via Rome, and it was played extensively throughout the Byzantine Empire under the name tabla.<sup>139</sup> In fact, none of the Byzantine derivatives of the name for backgammon suggest any knowledge of the Arab name for the game, nardshir or nard.<sup>140</sup> The almost

certain arrival of backgammon from the West is in contrast to the probable route of chess into Byzantium from some point in the East.

In the East, backgammon has been called nard from earliest times. There are a number of stories and legends which purport to document the invention or arrival of the game in Persia. None are considered to provide any definitive information concerning the origin of nard, but the story most often referred to, and the one which seems to be considered as the most widely accepted, again involves Artakshir, son of Papak, founder of the Persian Sassanian Dynasty. He is said to be the inventor of the game,<sup>141</sup> and his name, sometimes spelled Ardshir, is thought to have been the basis of the word nardshir, later shortened to nard.

The first literary reference to nard apparently is found in the Babylonian Talmud, compiled between A.D. 300 and 500.<sup>142</sup> This mention in the Talmud was interpreted by some as a reference to chess, which led to speculation concerning an earlier origin for chess than that now believed. This interpretation has been discounted by chess authorities.<sup>143</sup> Following the mention in the Talmud, the next literary reference to nard is found in the Chatrang-namak, which discusses the introduction of both chess and nard into Persia in the period 531-578.<sup>144</sup>

In that story, nard is invented in order to confound an Indian king. The same story is told by Abu al-Qasir Masur Firdawi in the Shanama, completed in 1011.

In a parallel to the story of the diffusion of chess, conquering Muslims were playing nard before the end of the 7th century and carried the game with them wherever they travelled.<sup>145</sup> However, in contrast to the situation with chess, the Islamic form of backgammon met the Roman-Byzantine game of tabula or tabla in Western Europe and both forms were played in many countries, most notably France.<sup>146</sup> At this point, the two games were essentially identical except that tabula used three dice whereas nard used but two.<sup>147</sup>

From one or both of these two major sources, the game spread to the east and to the west. Probably no later than the 11th century, some form of backgammon was being played throughout Europe, Asia and North Africa.<sup>148</sup>

The use of fashioned and often elaborate gaming pieces began with the earliest games in Ur and Egypt. These pieces were for use on elaborate and permanent boards. Simpler playing pieces were used when the games were played by less affluent citizens. Readily available objects of almost any kind, pebbles, bits of pottery, shells, seeds, even pellets of camel, or goat or sheep dung, were pressed into service as tablemen.<sup>149</sup> The

archaeological evidence is not totally clear, but it appears that the use of circular disks as standard gaming pieces originated in Greece or Rome.<sup>150</sup> The overriding factor in the change to and dominance of such tablemen was the ability to double or pile men made in this form. The flat, circular disk became the standard shape for the tablemen used in all early forms of backgammon.<sup>151</sup> In fact, there is some evidence that Roman coin-like disks which puzzled numismatists may have been playing disks used as tablemen in the game of tabula. These "contorniates" often carried the likeness of a god or emperor on one side with perhaps a building or a wreath accompanied by a number (never higher than 15) on the other. Expensive versions were of gold or silver, less expensive copies of bronze.<sup>152</sup>

Some European medieval backgammon boards were double the size of the chessboard, and the tablemen therefore were too large for use on the squares of a chessboard. Thus, some medieval European tablemen were somewhat larger than modern backgammon pieces.<sup>153</sup> This certainly was not the case with the Glass Wreck tableman. The diameter of the piece is 2.9 cm. The Glass Wreck chess pieces, with the exception of the pawns, average very close to that diameter. There would have been no difficulty in using the same playing surface for both the backgammon tableman

and the chessmen found on the Glass Wreck.

It should be emphasized that the tableman from the Glass Wreck was not necessarily used for backgammon. It is of a simple, standard form, one which has been used interchangeably for various games.<sup>154</sup> However, as indicated above, in the opinion of those who have studied games extensively, the Glass Wreck tableman most probably comes from a backgammon set.

There is little question that both Byzantine society and Islamic society were well acquainted with the game of backgammon at the time of the shipwreck. It is likely that both cultures would have been playing it or a closely related game for centuries prior to the sinking. But the Glass Wreck tableman offers no clue to the nationality of its owner since it is of such a simple, universal, and long-enduring form.

Tracing the origins and diffusion of chess and backgammon shows the constant linking of the two games. We see this in an enormous number and variety of literary references.<sup>155</sup> The two games seem naturally connected in the thoughts and conversations of peoples at various points in both time and space. Perhaps the linking of these two games on the Glass Wreck speaks again to the importance of the wreck as a truly representative Mediterranean "time capsule" from the 11th century.

## CHAPTER VI

## ISLAMIC AND BYZANTINE ATTITUDES TOWARD GAMES

Was the owner of the Serçe Limani chessmen Byzantine or someone from the Islamic world? On the basis of the greater Islamic awareness of, and interest in, the game of chess, I already have suggested that the chess pieces more likely were the property of a Muslim. To pursue this point, the general attitudes of these two societies toward the playing of chess should be noted.

In examining any Islamic position, it is important to understand the extent of social control exercised by Islamic law, even in such seemingly unimportant matters as games. D.B. MacDonald describes the scope and personal impact in his Development of Muslim Theology, Jurisprudence and Constitutional Theory:

Muslim law in the most absolute sense fits the old definition, and is the science of all things human and divine. It tells us what we must render to Caesar and what to God, what to ourselves, and what to our fellows. The bounds of the Platonic definition of rendering to each man his due it utterly shatters. While Muslim theology defines everything that a man shall believe of things in heaven and in earth and beneath the earth... Muslim law prescribes everything that a man shall do to God, to his neighbour and to himself. It takes all duty for its portion and defines all action in terms of duty.<sup>156</sup>

With this as background we see the need for Islamic society to determine the legal status of each and every

action. This is no less true of games than of any other aspect of life.

To make legal status determinations such as this, the Koran, although not the only source, becomes a major point of reference. In the earliest<sup>157</sup> mention of games, the Koran is somewhat conciliatory:

They question thee about strong drink and games of chance. Say: In both is great sin, and some utility for men; but the sin of them is greater than their usefulness. And they ask thee what they ought to spend. Say: That which is superfluous. Thus Allah maketh plain to you (His) revelations, that haply ye may reflect.<sup>158</sup>

This seems more a suggestion or recommendation than a prohibition against playing games of chance. In fact, it seems to anticipate some participation in such games when it cautions not to gamble beyond one's means. The only other reference to games is made in a portion of the Koran written later.<sup>159</sup> It is much more straightforward:

O ye who believe! Strong drink and games of chance and idols and divining arrows are only an infamy of Satan's handiwork. Leave it aside in order that ye may succeed.

Satan seeketh only to cast among you enmity and hatred by means of strong drink and games of chance, and to turn you from remembrance of Allah and from (His) worship... Obey Allah...<sup>160</sup>

These words leave little doubt about the legality of games of chance. There is agreement that the condemnation of maisir (the word used in referring to games) should be taken to include all games involving an element of chance



or games in which a wager is placed.

There is no specific reference in the Koran to chess or backgammon. The common Islamic practice, in the absence of specific references, is to refer to other established rulings in order to make decisions.<sup>161</sup> For example, wine is forbidden in the Koran under the word khamr which literally means "anything intoxicating." By the doctrine of deduction by analogy (giyas),<sup>162</sup> this decision can be extended to cover all intoxicating drugs. In the same way, the latter of the two Koran references to games of chance was used to condemn chess and backgammon. The application seems clear in terms of backgammon. Since something more than chance was involved in chess, its condemnation by analogic deduction was not universally accepted.

In the absence of direct references in the Koran and the inconclusive application of the principle of analogic deduction, Islamic law had to turn to the traditions (hadith) for further enlightenment on chess. These traditions record the actions and sayings of the Prophet Muhammad and his companions and carry almost equal force with the Koran in Islamic life.<sup>163</sup> In considering this point we must note that Islamic law divides all actions into five classes: sunna (meritorious), actions the neglect of which is not punished but the performance of

which is rewarded; muhab (indifferent), actions the performance or neglect of which the law leaves open and for which neither reward nor punishment is expected; fard (obligatory), that which is strictly prescribed, the omission of which will be punished while the execution will be rewarded; makruh (reprehensible), actions which although not punishable are disapproved of from the religious point of view; haram (forbidden), actions punishable by Allah.<sup>164</sup>

Three traditions have been preserved in the hadith which have some applicability here. All deal with Muhammad's attitude toward recreation. One of these emphasizes his hatred of games of chance. Another shows his approval of martial exercise with lance or bow. The third preserves a statement that a believer should restrict his amusements to his horse, his bow, and his wife or wives.<sup>165</sup> These three traditions form the basis for the involved, and ultimately unresolved, discussions of the status of chess in Islamic society.<sup>166</sup> In the end, based on all the enquiry into the hadith, no outright condemnation of the game was universally accepted in the Islamic faith. There seems to have been an acceptance of the possibility of the negative aspects of playing the game, a makruh (disapproved) status, but no confirmed haram (forbidden) status for it.<sup>167</sup>

In Byzantine society also there were religious concerns about the playing of games. The scarcity of literary references limits our knowledge of the impact of these concerns. We do know that the early medieval church strongly disapproved of the use of dice and attempted to suppress such activity through church legislation. In its apostolic canons adopted at Constantinople in A.D. 680, the Eastern church required both the clergy and the laity to give up the playing of dice.<sup>168</sup> Beyond this, however, the first direct reference to religious concerns about the playing of chess apparently did not come until a time shortly after the sinking of the ship at Serce Limani. In a letter to the Pope in 1062, Bishop Damiani of Ostia vigorously denounced members of the clergy who "defile" their hands by playing dice and chess.<sup>169</sup> We already have noted the interest Byzantine Emperor Alexis Comnenus took in the game of chess during the late 11th and early 12th centuries. Apparently John Zonares, the commander of Comnenus' bodyguard, did not share the Emperor's enthusiasm for games. After his service with the Emperor, he retired to a monk's life in a monastery where he wrote a commentary on the apostolic canons mentioned above. In his comments Zonares declared that both chess and dice should be banned by the church. He suggested that members of the clergy who played the game should be deposed, and

that lay persons who did so should be excommunicated.<sup>170</sup>

In a situation which parallels the Islamic discussion of the question, the suggestions by Zonares and Damiani that the apostolic canons covered both dice games and chess were disputed by some other members of the clergy. They suggested that games of chance were covered by the canons, whereas chess, played without dice, was not.<sup>171</sup> This point seems never to have been resolved fully.

The references by Damiani and Zonares come relatively soon after the period of our shipwreck. Given these concerns, and the early apostolic canons, it is probable that the morality of dice and chess had been questioned for some time. It is likely that such concerns would have been known to all lay members of the church at the time of the Glass Wreck sinking. If the crew of the vessel were Byzantines, they surely would have been aware that the playing of backgammon was a clear transgression of canon law. It is also probable that they would have knowledge of a similar, if perhaps less clearly defined, concern about the playing of chess. There is no evidence that these concerns were taken lightly or in any way ignored by the church faithful. There is some suggestion that the concerns about chess, in fact, were taken seriously in Byzantine society and that the intolerance of the church in this regard accounts, at least in part, for the paucity

of references to chess in the Eastern Empire.<sup>172</sup>

In contrast to the Byzantine attitude we know that since it was not strictly forbidden, either through direct Koranic reference or investigation of the hadith, excuses were found among Muslims to play chess. There is ample evidence that religious concerns were regularly ignored and chess was played in the Islamic world.<sup>173</sup> While the legal questions concerning chess were sufficiently ambiguous to allow widespread playing of that game, there was a clear basis for a prohibition of backgammon in Islamic society. In spite of this unreserved ban, there is evidence that this prohibition also was widely ignored.<sup>174</sup>

Thus, in both Islamic and Byzantine societies the evidence is clear that the playing of backgammon was prohibited on religious grounds. In both societies strong religious concerns are also evident concerning the playing of chess. While there was no universality of opinion in either society concerning the religious acceptability of chess, Byzantines may have been more influenced by their church's position than were the followers of Islam. Certainly there is evidence of widespread playing of chess (and backgammon) in Islamic circles while apparently there is no such evidence in Byzantine society.

## CHAPTER VII

## SUMMARY

It is not surprising that gaming pieces were found on the medieval ship that wrecked at Serçe Limani. The playing of games on ships is of long-standing tradition with sailors around the world. Indeed, it would be surprising if such a tradition did not exist. Oceangoing ships face days, weeks, even months out of sight of land. Even on less expansive bodies of water like the Mediterranean, an 11th-century vessel might be on the open sea for a week or longer<sup>175</sup> with only routine duties to fill the hours of its crew. Passengers faced even more tedium. On most ships, activities not related to the running of the ship were limited and confined to a relatively small area. It was natural for crews and any passengers to turn to games as a means of passing long periods of time in an involving, pleasurable diversion from the routine of shipboard life. Although it may have happened, there was no need to invent new games. The games probably were simply the most familiar and most enjoyed by those bringing them on board.

There is evidence suggesting that playing of games on ships goes back more than 3,000 years. Undoubtedly, it has been a continuous activity of sailors from the very

beginnings of sea travel to the present. There is certain evidence of gaming on ships from the Greek and Roman periods, through the Middle Ages and into recent centuries. This evidence extends well beyond the confines of the Mediterranean, to the Atlantic coasts of European countries and to the shores of Asia, Africa, North America and Australia.

The archaeological evidence from ship sites alone demonstrates the ubiquity of maritime gaming. The earliest comes from Late Bronze Age shipwrecks at Ulu Burun<sup>176</sup> and Cape Gelidonya,<sup>177</sup> Turkey. On these wrecks were found knucklebones which may have been used as a form of dice.<sup>178</sup> Although knucklebones were used also for divination, given the considerable evidence for their use as gaming pieces<sup>179</sup> it is just as likely that they were so used on these ships. We do know, from a later period, that knucklebone representations on Roman lead anchor stocks were associated with gaming rather than divination.<sup>180</sup> A Roman wreck located near Brindisi, Italy, dated between 15 B.C. and A.D. 15, carried evidence of gaming in the form of an "ivory die."<sup>181</sup> A ship of the Roman period in Britain, found under 14 feet of silt in the bank of the Thames, carried "two light blue gaming counters;" this vessel is said to have sunk not long after A.D. 293.<sup>182</sup> The Gokstad ship, a Norwegian grave-ship

from around A.D. 900, carried a board for the game "Nine Men's Morris."<sup>183</sup> While a grave site is far different from a wreck site, there is every reason to believe that the owner would have taken the board with him on his travels in the normal course of events. A 13th-century Chinese ship, excavated in Fujian Province, carried a total of 20 chessmen of Chinese design.<sup>184</sup> A 13th- or 14th-century ship, wrecked off the coast of Korea, carried chessmen of Japanese style, as well as a "Go" board hastily carved by sailors into the top of a cargo crate.<sup>185</sup> The wreck of Henry VIII's flagship Mary Rose provided the most extensive archaeological evidence of game-playing on ships. Sunk during a naval engagement near Portsmouth in 1545, the Mary Rose contained a folding backgammon table with counters, a simple chess board, two gaming boards incised into the head pieces of a barrel (one for "Nine Men's Morris," the other unidentified), several dice and one domino.<sup>186</sup> A chess board strikingly similar to the one found on the Mary Rose was located on a Basque wreck of 1565 in the Gulf of St. Lawrence in Canada.<sup>187</sup> Two contemporaneous Dutch East Indiamen, the Lastdrager in 1653 and the Kennemerland in 1664, wrecked on the north coast of Scotland, carried dice on board.<sup>188</sup> Excavation of the Portuguese vessel Santo Antonio de Tanna, sunk off Mombasa, Kenya, in 1697, revealed the



presence of a number of tablemen, probably for use in a draught (checkers) game.<sup>189</sup> A die and a chessman were found on the Jutholmen wreck, an unidentified merchantman which sank off Stockholm, Sweden, around 1700.<sup>190</sup> An almost complete set of chessmen was found on the wreck of the English vessel James Matthews, sunk off the coast of Western Australia in 1841.<sup>191</sup> These sites encompass a time span from the 14th century B.C. to the 19th century A.D. and a geographic range touching on four continents. Yet these reflect only the major shipboard gaming-piece finds which have been reported and published. They are limited to shipwreck sites which have been investigated with at least some attention to detail. There is every reason to believe that any carefully excavated shipwreck should provide evidence of games played on board.

The Glass Wreck gaming pieces were almost certainly personal possessions. Associational evidence suggests this was the case for gaming pieces found on a number of other shipwreck sites.<sup>192</sup> It is probable, therefore, that find-spots of gaming pieces on shipwreck sites often identify living quarters. It is tempting to go further and suggest that the presence of chess pieces in one area of a medieval wreck might indicate that that area is in the stern section. A particularly interesting 15th-century illustration of a cog tends to reinforce this

possibility. In the illustration, two men prominently depicted on the stern castle obviously are playing a game of chess.<sup>193</sup> While future excavators should consider this relationship between the stern and chess pieces, there is evidence that this relationship was not always the case. The chess set on the Mary Rose, for example, was found in a cabin "in the bowcastle."<sup>194</sup> Another ship depiction, illustrating a Chinese merchant vessel of the 12th century, shows two people playing a game, that may well be chess, at the bow.<sup>195</sup> Unfortunately, locations of gaming pieces on shipwrecks often have not been recorded or at least not fully reported in existing publications. As such information becomes available from a wider cross-section of sites, further conclusions will be possible.

I have tried to demonstrate above how important a single category of finds can be in the interpretation of an excavated shipwreck. If the Glass Wreck gaming pieces had been the only artifacts found on this medieval shipwreck site, we still could draw conclusions from them. Most obviously, the areas in which they were found were probably living quarters. This is more clearly the case for the chessmen as a total of eight were found in one general area of the wreck. The backgammon piece is more problematical. Having only one tableman, we do not know if it was in its usual place of storage, or if it had

become separated and perhaps lost elsewhere on the ship. If it was part of a set in use at the time of the sinking, where are the other pieces? Why were at least some of the other tablemen not preserved?

We also could conclude from the presence of the chess pieces, and our knowledge of the history and diffusion of chess, that the wreck almost certainly sank some time after the 5th century A.D. However, a terminus post quem for the sinking of the vessel based on the chess pieces alone probably would not be possible.

The form of the chess pieces suggests that their owner was Islamic or someone closely associated with Islamic society. The form also suggests that the owner may have been a member of, or more closely associated with, the Sunnite sect, although the form is so universal that this can be no more than a possibility. For example, there is no evidence that Byzantine players used chess pieces which differed in basic shape from Islamic pieces. The owner could even have been Jewish.<sup>196</sup> Perhaps, since they had become very familiar and were easily carved, pieces shaped in the Islamic form lost any religious significance and simply became the standard "Staunton" pieces<sup>197</sup> of the early medieval period.

While the Glass Wreck pieces are true to the Islamic shape restrictions of their time, they would appear to

represent a totally different class of gaming pieces than those preserved in most collections. The basic shapes of Islamic chess pieces fell into fairly consistent patterns, but the decoration of the pieces varied from simple to extremely elaborate. While the Adelshofen pieces (ill. 7 [p. 13]) carry essentially no decoration, the Osnabruck pieces (ill. 8 [p. 13]) and the Ager pieces (ill. 23 [p. 37]) are elaborately worked. Most of the extant pieces are more likely to be decorated to some extent since they belong to sets which were, for the most part, the property of the rich and the powerful. In this respect, the Glass Wreck chessmen represent unusual examples from their period. They are obviously simple. They carry no apparent decoration. Just as the Serce Limani ship probably represents an average, standard working vessel of its time, the Glass Wreck chessmen are perhaps more truly representative of 11th-century chess sets than any other existing pieces. They are not elaborate men fashioned to be used by nobility or generals, or to be put on display. They are simple, wooden men, perhaps carved by their owner, an ordinary seaman or passenger - "a little worm on a splinter"<sup>198</sup> - who sailed in A.D. 1025.

## NOTES

1. E. Avedon and B. Sutton-Smith, The Study of Games (New York 1974) 11.
2. The harbor is called simply Serçe Liman by the local people, and it was thus called in early site reports. In proper Turkish, however, it should end in an undotted "i," a letter which for convenience appears in this thesis, as usually in English, as a dotted "i."
3. D.A. Slane, The History of the Anchorage at Serçe Liman, Turkey (unpubl. M.A. thesis, Texas A&M University 1981), traces the long use of the harbor anchorage at which the ship sank.
4. S.D. Goitein, A Mediterranean Society: The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza I. Economic Foundations (Berkeley and Los Angeles 1967) 214, describes piracy off Antalya around A.D. 1028, close to the place and date of the Serçe Limani shipwreck.
5. G.F. Bass, "A Medieval Islamic Merchant Venture," Archaeological News 8, no. 2/3 (1979) 86 and 88.
6. G.F. Bass and F.H. van Doorninck, Jr., "An 11th Century Shipwreck at Serçe Liman, Turkey," IJNA 7 (1978) 119-132.
7. G.F. Bass, "The Million Piece Glass Puzzle," Archaeology 37 (1984) 42-47.
8. G.F. Bass, "The Nature of the Serçe Limani Glass," JGS 26 (1984) 64-69.
9. G.F. Bass, J.R. Steffy, and F.H. van Doorninck, Jr., "Excavation of an 11th-Century Shipwreck at Serçe Liman, Turkey," National Geographic Society Research Reports, 1976 Projects (Washington 1984) 161-182.
10. J.R. Steffy, "The Reconstruction of the 11th Century Serçe Liman Vessel: A Preliminary Report," IJNA 11 (1982) 13-34.
11. Bass and van Doorninck (supra n. 6) 126.
12. Bass, Steffy and van Doorninck (supra n. 9) 174.

13. F.H. van Doorninck, Jr., Field Notes Summary (unpubl. 1978) 8.
14. M. Rowling, Life In Medieval Times (New York 1979) fig. 35 on p. 76.
15. L. Graham, Chess Sets (New York 1968) 10, 12; H. Golombek, Chess: A History (New York 1975) 51.
16. F.H. van Doorninck, Jr., personal communication, 1980.
17. C.K. Wilkinson, "Chessmen and Chess," BMMA (1943) 6.
18. Golombek (supra n. 15) 51.
19. van Doorninck (supra n. 13) 7.
20. J.R. Steffy, personal communication, 1980.
21. H.J.R. Murray, A History of Chess (Oxford 1913) 155, 224; D.M. Liddell, Chessmen (New York 1937) 7.
22. Murray (supra n. 21) 224, says inks of these colors were the easiest to obtain during this period.
23. Steffy (supra n. 20). The pieces appear to be made of red oak, the same material used in construction of some portions of the vessel.
24. Steffy (supra n. 20).
25. K.A.C. Creswell, "The Lawfulness of Painting in Early Islam," Ars Islamica 11 (1946) 160.
26. J.F. Harbeson, Nine Centuries of Chessmen (Philadelphia 1964) 5, says that "the Koran...forbids graven images...."; H. Wichmann and S. Wichmann, Chess (New York 1960) 16, state that "the Koran prohibits any kind of imagery...."
27. H.A.R. Gibb and J.H. Kramers, eds., The Encyclopaedia of Islam (Leiden 1960) 554.
28. E. Kuhnel, Islamic Art and Architecture (London 1966) 23.
29. Murray (supra n. 21) 191.

30. Murray (supra n. 21) 191.

31. O. Grabar, The Formation of Islamic Art (New Haven 1973) 75; A. Hammond, The Book of Chessmen (New York 1950) 31 and 33. Reference to a "Sunnite" chess set still means one which is non-representational (although now of a different form than that of the Glass Wreck set).

32. C.K. Wilkinson and J.M. Dennis, Chess: East and West, Past and Present (New York 1968) 28. There are only two chessmen of representative form up to the 9th century and none which are dated with any precision before the 12th century.

33. Wilkinson and Dennis (supra n. 32) 29.

34. Wichmann and Wichmann (supra n. 26) 18.

35. Field Notes (1978) 623. Notes read: "Lot 1471 (provenience unknown - bag found in O5 LL)." This suggests that an excavator had dropped or left behind the plastic bag in which he collected artifacts. GW 486 came from this bag. On the bag contents list, GW 486 most probably is #18 "wood knot."

36. Graham (supra n. 15) 14.

37. Wilkinson (supra n. 17) 11. Although there were many known variants on the standard 64-square board, boards in the East were "usually divided into 64 squares, eight to a side."

38. Murray (supra n. 21) 52; Wilkinson (supra n. 17) 11.

39. Harbeson (supra n. 26) 3.

40. Graham (supra n. 15) 13; Wilkinson (supra n. 17) 9; Murray (supra n. 21) 220. The use of soft boards has continued into more recent times in the East. T.C. Plowden, ed., Travels in Abyssinia and the Galla Country (London 1868) 149; Wilkinson and Dennis (supra n. 32) 30.

41. D.H. Keith, "A Fourteenth Century Shipwreck at Sinan-Gun," Archaeology 33 no. 2 (1980) 35.

42. M. Rule, Mary Rose (London 1982) 190 and 192.

43. S. Davis, Parks Canada, personal communication, 1985.

44. Liddell (supra n. 21) 3.
45. R.C. Bell, Board and Table Games from Many Civilizations (London 1969) passim; H.J. Murray, A History of Board Games other than Chess (London 1952) passim.
46. C. Pulak, personal communication, 1983.
47. R.C. Bell (Newcastle University, England), personal communication, 1980; K. Brisch (Museum für Islamische Kunst, Berlin), personal communication, 1980; D.H. Caldwell (National Museum of Antiquities, Edinburgh), personal communication, 1980; M. Jenkins (Metropolitan Museum of Art, New York), personal communication, 1980; F. Joubert (Musée National des Thermes et de l'Hotel de Cluny, Paris), personal communication, 1980; F.F. Llevot (Universitat de Barcelona), personal communication, 1983; J.M. Rogers (British Museum, London) personal communication, 1980; C.K. Wilkinson, personal communication, 1980.
48. Bell, Caldwell, and Wilkinson (supra n. 47).
49. Bell, Caldwell, and Wilkinson (supra n. 47).
50. W.F. Albright, "The Excavation of Tell Beit Mirsim II," AASOR 17 (1936-1937) 117; S. Culin, "Chinese Games with Dice and Dominoes," Annual Report of the U.S. National Museum, 1893 (Smithsonian Institution, Washington, DC) 534-535.
51. Bell (supra n. 47); Bell (supra n. 45) passim; Murray (supra n. 45) passim; J.S. Scarne, Scarne on Dice (New York 1972) 22-33.
52. Bell and Wilkinson (supra n. 47); B. Kisch, Scales and Weights: A Historical Outline (New Haven 1965) 143 and passim.
53. J.F. de Rochesnard, Album des poids afriques (1978).
54. de Rochesnard (supra n. 53).
55. de Rochesnard (supra n. 53) and personal communication, 1982.
56. Kisch (supra n. 52) 97.



57. P. Grierson, Byzantine Coins (Berkeley and Los Angeles 1982) 345; M. Mitchiner, Oriental Coins and Their Values: The World of Islam (London 1977) 59 and 68 ff. The dinar was modelled metrologically on the Byzantine solidus (nomisma) which had a slightly greater weight of 4.55 grams.
58. P.M. Holt, A.K. Lambton and B. Lewis, eds., The Cambridge History of Islam II (Cambridge 1970) 526.
59. G.F. Bass, personal communication, 1979.
60. Bass, Steffy and van Doorninck (supra n. 9) 169. Three bower anchors were still in place and five spare anchors stored when the ship went down, suggesting that the sinking happened quickly.
61. Rule (supra n. 42) 190 and 192.
62. UNESCO, Underwater Archaeology: A Nascent Discipline (1972) 246.
63. J. Rosloff, personal communication, 1980.
64. Murray (supra n. 21) 47 ff. Although dice were used in playing chess in various times and places, it is not likely to have been the case in this time and place.
65. Rosloff (supra n. 63).
66. Goitein (supra n. 4) 318-323.
67. Plowden (supra n. 40) 319.
68. A. Cockburn, Idle Passion: Chess and the Dance of Death (New York 1974) 108.
69. Golombek (supra n. 15) 55; Murray (supra n. 21) 444.
70. Cockburn (supra n. 68) 117.
71. Murray (supra n. 21) 353.
72. B. Meakin, The Moors (New York 1902) 124.
73. Cockburn (supra n. 68) 103; Murray (supra n. 21) 210.
74. Cockburn (supra n. 68) 103; Murray (supra n. 21)

210.

75. J.R. Steffy, personal communication, 1980.

76. Murray (supra n. 21).

77. E.g., Graham (supra n. 15) 11-12; Hammond (supra n. 31) 11; H.J.R. Murray, A Short History of Chess (Oxford 1963) 1; Wilkinson and Dennis (supra n. 32) x; Wichmann and Wichmann (supra n. 26) 9.

78. Graham (supra n. 15) 12.

79. Golombek (supra n. 15) 12; Murray (supra n. 21)  
1.

80. Murray (supra n. 21) 119-147.

81. Murray (supra n. 21) 150-160.

82. Murray (supra n. 77) 28 ff.

83. Murray (supra n. 21) 403.

84. Murray (supra n. 77) 7.

85. Murray (supra n. 77) 7.

86. Murray (supra n. 21) 149.

87. E.G. Browne, A Literary History of Persia I  
(Cambridge 1951) 108, 122; Murray (supra n. 29) 149.

88. Browne (supra n. 87) 137 ff.; Murray (supra n. 21) 149.

89. Murray (supra n. 21) 151.

90. Murray (supra n. 21) 151.

91. Browne (supra n. 87) 141.

92. Murray (supra n. 21) 149-150. This takes into account a minimum amount of time for the game to diffuse and become familiar to the general public.

93. Wilkinson (supra n. 17) 3.

94. Murray (supra n. 21) 149.

95. Murray (supra n. 21) 149; Browne (supra n. 87)  
110 ff.
96. Murray (supra n. 77) 11.
97. Murray (supra n. 21) 153 ff.
98. Murray (supra n. 21) 156.
99. Murray (supra n. 21) 156.
100. Murray (supra n. 21) 157-158.
101. Golombek (supra n. 15) 28; Murray (supra n. 21)  
163.
102. Murray (supra n. 21) 166.
103. Murray (supra n. 21) 154.
104. Golombek (supra n. 15) 25.
105. Graham (supra n. 15) 13.
106. Murray (supra n. 21) 164.
107. Murray (supra n. 21) 164.
108. Golombek (supra n. 15) 12 ff.
109. Golombek (supra n. 15); Graham (supra n. 15);  
Hammond (supra n. 31); Liddell (supra n. 21); Murray  
(supra ns. 21 and 77); Wichmann and Wichmann (supra n.  
26); Wilkinson (supra n. 17); and all German and French  
counterparts to which they make reference.
110. Wilkinson (supra n. 17) 9.
111. O. Grabar, R. Holod, et al., City in the  
Desert: Qasr al-Hayr East (Cambridge 1978) 189.
112. Liddell (supra n. 21) 142.
113. Graham (supra n. 15) 27; Wichmann and Wichmann  
(supra n. 26) 277.
114. Graham (supra n. 15) 27; Wichmann and Wichmann  
(supra n. 26) 277.
115. Golombek (supra n. 15) 57; Graham (supra n. 15)

- 26-27; Wichmann and Wichmann (supra n. 26) 279.
116. Golombek (supra n. 15) 57; Graham (supra n. 15) 26-27; Wichmann and Wichmann (supra n. 26) 279.
117. Liddell (supra n. 21) 14; Wichmann and Wichmann (supra n. 26) 274.
118. Liddell (supra n. 21) 14; Wichmann and Wichmann (supra n. 26) 274.
119. F. Joubert, personal communication, 1980.
120. Graham (supra n. 15) 26; Wichmann and Wichmann (supra n. 26) 278.
121. Wilkinson and Dennis (supra n. 32) pl. 5.
122. E. Kuhnel, The Minor Arts of Islam (Cornell 1971) 228.
123. Graham (supra n. 15) passim; Liddell (supra n. 21) passim; Wichmann and Wichmann (supra n. 26) passim.
124. Graham (supra n. 15) 16; Murray (supra n. 21) 89-90.
125. Wichmann and Wichmann (supra n. 26) 276.
126. Golombek (supra n. 15) 51-52; Wichmann and Wichmann (supra n. 26) 276.
127. Golombek (supra n. 15) 51-52; Wichmann and Wichmann (supra n. 26) 276.
128. Wichmann and Wichmann (supra n. 26) 279-280.
129. Liddell (supra n. 21) passim; Wichmann and Wichmann (supra n. 26) passim.
130. F.H. van Doorninck, Jr., personal communication, 1985, is inclined to believe on the basis of what is presently known about the artifacts from the Glass Wreck that both the merchants and crew were Byzantine Greeks whose primary place of residence, however, was probably within the Fatimid realm.
131. Murray (supra n. 45) 13.
132. L. Woolley, Excavations at Ur (London 1954) 61.

133. R.C. Bell, The BoardGame Book (London 1979) 83.
134. R.G. Austin, "Roman Board Games," Greece and Rome 4 (1934) 33.
135. Austin (supra n. 134) 33.
136. Bell (supra n. 133) 84.
137. R.G. Austin, "Roman Board Games II," Greece and Rome 4 (1935) 78.
138. R.G. Austin, "Greek Board Games," Antiquity 14 (1940) 259 ff.
139. Austin (supra n. 137) 78.
140. W. Fiske, Chess in Iceland (Florence 1905) 173.
141. Murray (supra n. 45) 114.
142. Murray (supra n. 45) 14.
143. Graham (supra n. 15) 13.
144. Browne (supra n. 87) 110 ff.
145. Graham (supra n. 15) 13.
146. Murray (supra n. 45) 117.
147. Bell (supra n. 133) 83.
148. Murray (supra n. 45) passim.
149. Bell (supra n. 133) 82.
150. Austin (supra n. 137) 80; H. Goldman, Excavations at Gözlü Kule, Tarsus I. The Hellenistic and Roman Periods (Princeton 1950) 398 and 273.
151. Austin (supra n. 137) 80.
152. K.A. McDowall, "Contorniates and Tabulae Lusoriae," NC 4 (1906) 233 ff.
153. Murray (supra n. 45) 117.
154. S. Culin, "Chess and Playing-Cards," Annual

Report of the U.S. National Museum, 1896 (Smithsonian Institution, Washington, DC) 665-838.

155. Fiske (supra n. 140) 70 ff.
156. D.B. MacDonald, Development of Muslim Theology, Jurisprudence and Constitutional Theory (New York 1903) 66.
157. M.A. Maulana, The Religion of Islam (New Delhi 1900) 738.
42. 158. M. Pickthall, The Glorious Koran (Albany 1976)
159. Maulana (supra n. 157) 738.
160. Pickthall (supra n. 158) 106.
161. N.J. Coulson, A History of Islamic Law (Edinburgh 1964) 9.
162. Holt, Lambton and Lewis (supra n. 58) 575.
163. Gibb and Kramers (supra n. 27) 117.
164. Gibb and Kramers (supra n. 27) 526.
165. Murray (supra n. 21) 191.
166. H. Lammens, Islam: Beliefs and Institutions (London 1968) 84 ff.
167. Murray (supra n. 21) 189.
168. Murray (supra n. 21) 166.
169. Cockburn (supra n. 68) 119.
170. Hammond (supra n. 31) 13.
171. Cockburn (supra n. 68) 119.
172. Murray (supra n. 21) 167.
173. Murray (supra n. 21) 117.
174. Murray (supra n. 21) 117.
175. Goitein (supra n. 4) 318.

176. C. Pulak and D.A. Frey, "The Search for a Bronze Age Shipwreck," Archaeology 38 (1985) 24.
177. G.F. Bass, Cape Gelidonya: A Bronze Age Shipwreck (Transactions of the American Philosophical Society 75, part 8 [Philadelphia 1967]) 133.
178. Culin (supra n. 153) 826.
179. Culin (supra n. 153) 827 ff.
180. F. Carrazé, "Note on Two Decorated Lead Anchor Stocks," IJNA 3 (1974) 155. The knucklebone decorations on the anchor stocks show four knucklebones. Carrazé says a set of four knucklebones was used in the game whereas five were used in divination.
181. A.J. Parker, "Two Wrecks of the Augustan Period found near Brindisi," IJNA 3 (1974) 147.
182. P. Marsden, "The County Hall Ship, London," IJNA 3 (1974) 62.
183. Bell (supra n. 45) 93-94.
184. J. Green, "The Song Dynasty Shipwreck at Quanzhou, Fujian Province, People's Republic of China," IJNA 12 (1983) 260.
185. Keith (supra n. 41).
186. Rule (supra n. 42) 190-198.
187. Davis (supra n. 43).
188. R. Price and K. Muckelroy, "The Second Season of Work on the Kennemerland Site, 1973. An Interim Report," IJNA 3 (1974) 262; R. Stenuit, "Early Relics of the VOC Trade from Shetland. The Wreck of the Flute Lastdrager lost off Yell, 1653," IJNA 3 (1974) 248.
189. R.C.M. Piercy, personal communication, 1980. A die also found on the wreck was identified by the author as being for a game invented after the vessel sank. At first believed to be of bronze, it now is thought to be of plastic and is clearly intrusive.
190. C. Ingelman-Sundberg, "Preliminary Report on Finds from the Jutholmen Wreck," IJNA 5 (1976) 65.

191. P. Baker and G. Henderson, "James Matthews Excavation," IJNA 8 (1979) 229.

192. Ingelman-Sundberg (supra n. 190) 65; Parker (supra n. 181) 147; Price and Muckelroy (supra n. 188) 262. These three indicate gaming piece association with other personal possessions. Reports on most of the other sites mentioned do not provide details of find areas or artifact association.

193. G.F. Bass, ed., A History of Seafaring Based on Underwater Archaeology (New York 1972) pl. 35.

194. Rule (supra n. 42) 190.

195. J. Needham, Science and Civilisation in China IV (Cambridge 1971) pl. CDVIII.

196. Goitein (supra n. 4) 254.

197. Liddell (supra n. 21) 33. The "Staunton" chessmen were designed in England in 1839 by Howard Staunton. In 1849 they became the dominant form of chessmen used in the Western world and have remained so to the present.

198. Goitein (supra n. 4) 320.



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