

“Money on the hoof” The astragalus bone – religion, gaming and primitive money

by

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Abstract:

This paper explores the presence of the astragalus bone found in vast archaeological contexts around the Mediterranean. The bone derives from the hind leg of sheep and goats and has been recorded in both secular and spiritual spheres. In the modern world the astragalus is perhaps better known as the knuckle bone or as the game with the same name. Because of its characteristic and cubic shape it is furthermore often considered the forerunner of the modern dice.

However, what is today considered games and pastime, usually derives from ancient cult practices and religion. These characteristics, besides the physical character of the bone itself, makes an interesting platform for yet another topic – that of primitive money. In exploring the religious parameters of the bone, besides its use as a common game piece, I want to show that the bone possesses qualities that might have developed into a medium of exchange among different historic and prehistoric cultures.

The overall outcome of this study will also show how the life-sustaining force brought to man by his livestock is expressed through the astragalus. It will furthermore show how games are integrated into religious practices aiming at the well being of the domesticated animals, as well as how games with astragali relates to bets and money. A direct link between money and religion, so called religious money, is yet another way of understanding the strong relationship between religion, games and primitive money touched upon in this paper.

The schematic illustration above shows the main discussion in this paper (*Fig. 1*). The triangle forms a whole, where different components create a state of dependence. Placed in the centre is the knucklebone, often called astragalus. This object is the recurrent theme and is frequent recorded among many archaeological remains. The bone is usually interpreted as a dice or ascribed diverse religious merits. These two qualities can be seen in the triangle: the spiritual world at the top and the game to the left. To the right we can see yet another less considered category, here illustrated by cowrie shells - the primitive money. I want to show that the astragalus with its religious connections, together with the nature of game, had the capacity to develop into a third quality, that of primitive money. What is today considered as game and pastime, usually have its origin in acts that were part of ancient religions and cult ceremonies. These qualities are equally important in order to understand how different objects may have developed into money.

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Fig. 1. The astragalus bone (centre) and its three characteristics discussed in this paper. Illustration: the author.

The primary purpose of this paper is thus to give an idea how the astragali may have been used as means of payment among different cultures around the Mediterranean during Bronze- and Iron Age - in some instances also in the succeeding periods.

One may suspect that archaeological interpretations in general have overseen various historical and prehistorical means of payments. As this might be the case, I also want to demonstrate indirectly how the astragalus can be used as an example of how we may approach the understanding of the, not only primitive, but also indistinguishable money.

What is an astragalus?

The name of the astragalus bone derives from the Greek word *astragalos* (plur. *astragaloi*). The provenance of the word, in this association, is unknown. The most common denomination world over today is, *knuckle-*

bone. This English term is used for the bone as an item within the sphere of games or for the object as such. The astragalus is the *talus* bone in the heel of ovicaprids, pigs, bovines and different cervids.¹ It can be found in many mammals, but it is among the above-mentioned animals that the bone possesses an attractive rounded but cubiform shape, making it suitable for dicing. It is most probably the shape that holds the key to the fact that man has dedicated the bone such an attention.

The astragalus and the archaeological testimony

Around the Mediterranean we have found astragali in different contexts already from the Neolithic period.² Onwards the bone appears in numerous diverse settings, such as private houses, palaces, boats, temples, churches, various sanctuaries and graves - astragali are closed down together with men, women and children.³ The bone also occurs in public places of everyday character, alone or in accumulations.⁴ It is in the contexts of private nature that the bones are usually interpreted as gaming pieces. This is due to the fact that many of the recovered astragali show traces of characteristic modifications into gaming pieces.⁵ Accumulations of several astragali in these settings might indicate different forms of games, but when found in graves or other sacred associations, they may have had a symbolic value where their spiritual powers could operate individually or in assembly.

Accumulations might be the result of deposits over a long time period. They can also be the results of deliberate gatherings, with tens or even up to hundreds of astragali deposited in the same containers, usually jars.⁶ This may indicate that the astragalus in some cases held another value, I would state, possibly commercial.

Decipher the use

A reason for collecting numerous dices may be that they, in virtue of gaming pieces, could be won by the opposite player/players. In this case the astragali would not in any appreciable extent differ from today's counters. If so, the idea of the astragalus as a medium of exchange may not be too speculative. Furthermore, this raises the question of how we can understand prehistoric games and perhaps also lead us to the answer why the astragalus belonged both to the religious sphere and to that of the game. If the bones had an undoubted link into the religious domain as well, the notion of money might be additionally appropriate. Money, as we shall see, often comes with spiritual properties and background.

A good source for different astragali occurrences is U. Hübner's *Spiele und Spielzeug im antiken Palästina*.⁷ Hübner provides detailed references to various findings of astragali. These are based on the original authors', often brief, conclusions and as such it falls outside the discussion of the interrelation between games and religion. This is also evident from the title of the book.

The astragalus and the spiritual world

Modern ethnographical studies made by Kabzinska-Stawarz examine the symbolic and magical significance of games with astragali among Mongolian Pastoralists.⁸ The studies confirm the remarkable complexities that prevail man's relationship to games and magic and not the least the interrelation between games and magic themselves. Kabzinska-Stawarz shows how the astragali were identified with fertility and manifoldness – the vital powers of the Mongolian pastoral economy. The relationship between the bone and the pastoral life was mirrored in the bones different sides which represented various domestic animals. A similar relationship was also evident in the magical properties of the bone, whose aim was to strengthen the life force of the animals and to increase the flocks. The foundation of this thought was the belief in a magic link between the astragalus, life and fertility. In this case the shepherds confined their consciousness to the economical sphere. Since the astragali symbolized the factual animals, they were often brought into the *yourta* and placed nearby an idol to emphasize man's togetherness with his animals.⁹

Studying the archaeological and historical material, confusion seems to prevail regarding the definitions of the spiritual world and its relation to the astragali. The archaeological record has provided us with a vast material, awaiting interpretation in accordance with each context. However, with the help of historical texts, ethnographical material and common sense it is possible to trace various expressions as amulets,¹⁰ symbols of fertility, votive offerings,¹¹ divination and the casting of lots,¹² as well as burial deposit.¹³ Attention-grabbing, for example, is the large accumulation of astragali collected from the altar region in the Bronze Age temple at Lachish.¹⁴ It is tempting to interpret these astragali as votive offerings where the priest kept the share - analogical to the Mosaic peace-offering, where the animals' hindleg was sacrificed before the altar and later kept by the priest (Leviticus 7:32-34). This kind of provision for performing the offering, usually the gaskin, is also attested in ancient Greece.¹⁵

These above examples of findings, undoubtedly religious in character and important for our coherence, will not be discussed in detail here since they are well attested phenomena. Instead we shall turn directly to the aspects of astragali and the game in order to complete the interrelation of religion, games and primitive money.

Astragali and the games

This subheading will discuss the seemingly pragmatic aspects of the game. I also want to briefly survey different aspects of the game with a starting point from questions arisen out of the archaeological material. The main focus will nevertheless be on the game of chance or so called gambling, since this is relevant for our discussion on the astragalus within the sphere of primitive money.

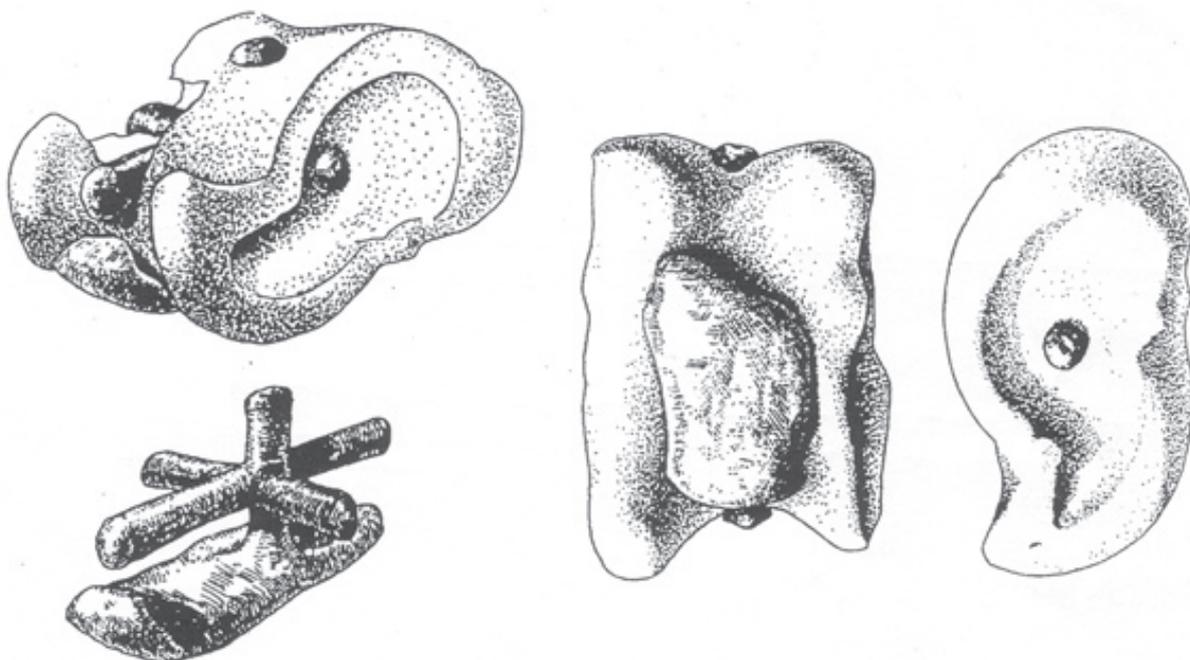


Fig. 2. The large lead prepared astragalus recovered from the palace in Ugarit. Illustration: after Schaeffer 1962.

In fact we know very little of games in prehistory and how people spent their pastime. What we do know is that people played. Around the Mediterranean there are several artefacts from diverse periods that testify the immense importance of games. In other words, we do not lack the find material, but we seldom devote thoughts of a certain playing context or how games were performed.

Man's passion for games and the lust of competing is deeply rooted in the human mind. We find it in one way or another in all cultures around the world. As stressed earlier, it might be difficult to draw a line between cult practices and the games that more or less must be regarded as pure amusement or games based on stakes. With proper analytical tools one may find that even the practical aspects of games in the modern and urban world today, in many ways are based on actions of cult or other underlying social related aspects. Ancient divination still has a lot in common with today's definition of fate. For some, the gods are ever present, even if we talk about gambling on horses, drawing of lots, board- and dice games. However, there is a significant aspect of the ancient games that develops concurrently and takes its own direction away from the religious sphere. This concerns gambling. These games of chance, one could state, combines the human playing instinct with the desire of the knowledge of her destiny. It is in this way games with dice hold a natural link to the powers of imagination and religious actions. The game is not only an interaction between the participants; it also devotes itself to the powers that we cannot control and to the supernatural forces. However, the most restricted sense of gambling is its characteristics of a contract between two or more participants. This involves an interchange of money or other valuables between the contestants after a particular event.¹⁶ Games of dice and all kinds of lottery (lottery including stakes) belong to gambling and they

are perhaps better known under the term *hazard*. Some uncertainties prevail concerning the origin of the word *hazard*. However, the Arabic word *zahr*, dice (alternative, counter) is one of the foremost candidates.¹⁷

If we suppose that some kind of stakes were involved in ancient games, is it then possible to find it in the historical or archaeological material? Brewster describes diverse sorts of games in Turkey some forty years ago. One game, short of name, is based on rules of throwing astragali in a way that resembles the way of playing marbles.¹⁸ The participants place the astragali in different lines on the ground. The aim is subsequently to, with help of another astragalus called *kuru*, throw it on the set out astragali and try to flip them over from their upright position to any other significant surface. The throwing device, the *kuru*, was larger than the other astragali and in some cases provided with lead on one of its sides to increase the strike. In modern marbles the *kuru* would equal the metal ball.¹⁹ Brewster's remark on the fact that this astragalus was larger than the others bears some significance. This astragalus is most certainly deriving from a cattle and the filling of lead undeniably brings to mind the astragalus found in the palace in Ugarit²⁰ (Fig 2.) and not the least other perforated and metal filled astragali found in countless other Bronze- and Iron Age sites in the eastern Mediterranean.²¹

Also the Mongolians use the larger cow astragalus to increase the strike in similar games.²² Important for this discussion are the rules of the games that Brewster gives account for. They are based on the system that the winner in a game obtains the astragali of the opponent. In his account of preislamic gambling, F. Rosenthal writes how well established this institution was and that the word gambling itself equalled the definition of "exchange". This is also mirrored in the Koran (5:91/93), where it within interpretations of dreams is said that

dreaming of dicing means quarrel about money. The definition *qimar*, writes Rosenthal, indicates the following: “a game with the condition that the winner of two contestants get something from the loser”.²³ The word *qimar* is further specially connected to games of dice with astragali.²⁴ Farther back in time the references are conspicuous by their absence, but we do see that under the time period of 1500 years, the traditions seems to be relatively unchanged when it comes to attaching astragali to stakes.

In all probability the astragalus itself is the stake, at least when taking in account modern gaming traditions and the word *zahr* with its connotation to a counter. Perhaps the astragalus from Ugarit makes one of the earliest indications for this institution, although we cannot be certain of any stakes involved.

Regarding the Mongolian playing traditions, Kabzinska-Stawarz writes that games with astragali were a kind of a magic performance with whose help the herders tried to secure a fortunate future. The believe in magical forces through games had its origin in the symbolic and magical powers of the astragali, but a great many of the players were no longer aware of these associations.²⁵ If these closed and self-supporting societies had the same prerequisites as societies with commercial aims in view, where possible profits could easily have been disposed, the gaming traditions might have changed character. In the Mongolian traditions of games there are certain games that are based on the rule to win the astragali from the contestant.²⁶ This set of rules very much resembles the Turkish ones that Brewster gives account for. Who collects the most points (astragali) wins and in the Mongolian herding society it claims happiness.²⁷ In some games the points can be expressed in the Mongolian currency.²⁸ The latter must nevertheless be seen as a result of the urbanistaion of the herding societies. The archaeological find material of astragali that owns any kind of metal filling are most certainly attestations of games with or without stakes.

The astragali as primitive money?

If we turn to our modern and seemingly pragmatic coins, and consider qualities such as tossing coin, lucky pennies, wishing-wells and various money substitutes such as counters along with terms as confidence- value, then the understanding of money becomes less self-explanatory and far more nuanced. That the first medias of exchange or the primitive money, goes hand in hand with local religions and that these in turn were integrated in the daily life, makes the phenomenon of money far more complicated. From later periods we know many cultures with a variety of primitive money. With this in mind, some ought to be found among the archaeological and historical record. The problem is how we can indentify them.

In the modern western society the word money has foremost been attached to coins or banknotes since these

are the most common way of making daily transactions. Money, however, is a common conception for several various types of standard of values that historically and geographically have had very varying appearance and qualities. Cowrie shells are one good example on successful primitive money that has been used on almost all continents of the world.²⁹ Dogs teeth is yet another case from the Solomo Islands³⁰ and we also recall the use of cocoa bean as money in old Mexico.³¹

Primitive money is a very complex and difficult definable occurrence with most stretchable frames due to many individual interpretations. For this reason, I prefer to use the term *medium of exchange* before that of primitive money when talking of astragali. I do this to widen the meaning of primitive money and since the characteristics might vary from author to author. In line with the discussion put forward by Einzig, the definition “medium of exchange” does not fulfil all the requirements of primitive money,³² because money can also be expressed in abstract units that not necessarily need to circulate as currency. The definition, medium of exchange, is nevertheless a good platform for our discussion. I consider that if the astragali do not fully carry out the prerequisites of a watertight definition of primitive money, they are not the least interesting as objects within the category of medium of exchange in various defined contexts. Einzig states that: for the economist the primitive money seems to represent pure barter.³³ I think this is a very important statement since this turn of mind in all probability also illustrates many archaeological interpretations of early forms of transactions. There is a tendency to often present a view of early cultures as only practicing barter of practical objects or consumer goods without any kind of standardized objects functioning as standards of value. With a starting point from diverse criteria Einzig defines primitive money as the following: “... a unit or an object conforming to a reasonable degree to some standard of uniformity, which is employed for reckoning or for making a large proportion of the payments customary in the community concerned, and which is accepted in payment largely with the intention of employing it for making payments”.³⁴ Uniformity does not necessarily mean that units or objects used as money have to be of the same quantity, weight or external manifestation. Objects that doesn't own the essential characteristics of uniformity can be reduced to another recognizable standard based on weight or other measurement. As a consequence, wheat can thus be a standard of value by specifying it in terms of weight or a unit of volume. But, if the weight or the specified volume of wheat would not be accepted as a defined value within a uniformed standard, then it cannot be ranked among substitutes for money.³⁵ Accordingly, primitive money does not embrace units used for converting payments or the objects themselves used to make the payment. The definition payment concerns all customary types of compensations within a community – and therefore not only commercial payments.

Religious aspects of primitive money

On the basis of the strongly religious and spiritual nature of the astragali and also how these were integrated in games, I regard it as relevant to look at some aspects on definitions of religious money:³⁶

1. Money has in many cases its origin in regular needs of standardized objects as offerings to the gods.
2. In many cultures the making of money are dedicated to the supernatural powers.
3. People that produce money must often pay attention to certain religious rules or rites when performing their sacral undertaking.
4. Magical attribute assigned to certain objects have later adopted functions as money.
5. The use of certain objects in religious purposes other than offerings (where the article is burned), such as in death rites, has most probably contributed to their adoption as money.
6. The establishment of fines for breaking taboos and charges for attending religious rites, caused the need for a standardized unit.

Bernhard Laum writes in his work, *Heiliges Geld*, that the god that bears the responsibilities for certain activities got offerings from the goods produced within that gods division. During the classical era for example, Demeter - the giver of grain, acquired grain offerings. One could say that Laum developed a theory that the practice of sacrifice to the deity constitutes a form of barter between humans and their gods.³⁷ An important aspect of Laum’s theories is the next step of evolution of money within the religious sphere. This concerns the payment to priests that conducted sacrifice of oxens or equivalent units of value. In ancient India, Laum states, the fee that was designed to pay for the execution of offerings was expressed in standards of cattle. This could accordingly be paid in other objects and it was for this reason that units other than cattle required an established equivalence. This is one of the reasons, often stated, that cattle became the standard of value in India.³⁸ The great number of accumulated astragali within cultic contexts in ancient Lachish and Megiddo³⁹ are interesting to apply on Laum’s theories.

An historical testimony

One of the perhaps most interesting references I came across regarding astragali as a possible medium of exchange, derives from the 10th century. One of the Arabic geographers and travellers, Ahmad ibn Fadlan, gives a travelling account from the eastern side of the Caspian Sea. An exciting passage is the description of the money exchangers in Chwarism.⁴⁰ Ibn Fadlan writes about the institution of using dirhems when buying property and slaves. He also gives account of how coins are sold alongside dice. The latter are here occurring in

a commercial context. The question arises – why did the money exchangers sell dice and what is ibn Fadlan referring to? Is the account given for the six-sided dice or the astragalus?

I would say that, if the astragali were not used as money *per se*, one could assume that in Chwarism it was possible to exchange a currency into astragali (counters) that had a defined commercial value. That these dice would have been in the shape of the today more common cubic dice must perhaps be considered as less credible. Astragali, as already discussed, are instead perfect counters. During the whole Islamic era the dice is called *kâ'b* or *kâ'bah*. According to Rosenthal, *kâ'b* is without a doubt referring to the astragalus and not to the six-sided dice.⁴¹ In all probability it is in cases as Chwarism that astragali had to be purchased as stakes within gaming. That the astragali, compared to the six-sided dice, are impossible to fake should perhaps be the most likely criteria to the fact that we are dealing with astragali. In the account for various traditional games in Turkey, we have also seen that it was the winner in a game that won the play opposites astragali or other units of value.⁴² These types of games are also defined as gambling or hazard. We also recall from preislamic gambling how well established this institution was and how gambling was equivalent with the definition “exchange”.⁴³

Discussion

I have tried to show how the seemingly modest bone, the astragalus, have possessed fairly complex characteristics. In combining the ethnographical, archaeological and historical record we know that the bone is strongly connected to both games and the spiritual world. This is a natural consequence, since these two institutions are dependent upon each other. Dice that belong to games of chance have developed yet another niche, that of gambling, where games were played for stakes. This latter perspective together with the religious aspects of the astragalus bone might very well have given the bone a third function, that of a medium of exchange or primitive money.

The religious qualities of the bone, in all probability, loses themselves far back in time. Since the domestication of livestock, the humans life-sustaining and survival forces have been depended to the propitious interplay between herself and the animals. To maintain this stability, man have communicated with higher powers through magic and symbolic rituals. The ritual objects themselves, convenient for this communication, were represented by the objects that were direct products of this interplay. That it was the astragalus that became the focus for this purpose is possible to trace among many different cultures over the world. This was certainly a result of the bones unusual physical qualities, where the carnal manifestataion of the astragalus stood in contrast to its divine shape. We can only speculate in wether the supernatural powers that the bone was provided with, in contrast to other bones, was a result of similar thoughts.



Fig. 3. Mongolian herdsmen playing with astragali. Illustration: after Kabzinska Stawarz 1991.

An artificially shaped object furthermore lack the divine origin that a bone possesses and falls outside the reciprocal machinery that so very well illustrates how perishableness is a prerequisite for the creation for new life.

Pastoral life in Mongolia is the closest we can get a culture where the magic and symbolic powers of the astragali still today possesses a strong influence on the people. Through ethnographic studies of the Mongolians, it is possible to see that the bone represents the entire pastoral economy. Since the astragali have a self-evident connection to the life-maintaining animals, the bone also seize a fertile and protective power. This power recognizes itself when the bones are used in different matters. This can be manifested through divination, the use of amulettes or as different tool in games. Divination and games are intertwined in a set of complicated expressions in Mongolia and the players themselves are often without the knowledge of diverse game tradition. Historical sources and archaeological finds from the ancient world tells us about similar thoughts found among the Mongolians. In the way that many astragali have been prepared around the Mediterranean and in the Near East, during the last 4000 thousand years, it suggests that the use of astragali have been relatively unchanged. The game itself seems to have been the most common way of making use of the bone, but since it is very hard to distinguish the practice of game and ritual – in many cases of no advantage at all, the exact purpose and use is not always clear. Divination through the casting of lots is based on the same principle as the game of dice - that to allow a supernatural will to decide the outcome of man's

destiny. Most probably it is the procedures rudimentary manifestation connected to the dualistic thinking comprising life-death, good-evil, yes-no and so forth, that have made the astragali suitable with its characteristic cubic shape. These ingredients have kept the traditions of the bone relatively homogenous and unchanged, or as Brewster writes, "games of mankind know no geographical, political, or linguistic boundaries".⁴⁴

Many religious qualities are also determinative for an object to develop into an standardized medium of exchange within certain parameters. Some of these characteristics go hand in hand with the features that can be traced to the astragali bone. As mentioned, many cultures have ascribed the qualities and origins of money to the supernatural powers. This is further something that correspond to the shape of the astragali and that also made the bone suitable as a tool for divination. The primitive money have often their origin in the customary needs of standardized objects as offerings to the gods. Through the archaeological record and in contexts of offerings there are several examples of the importance of astragali. The deity that held the responsibility for the viability of the livestock received offerings of the same kind. This resulted in a reciprocal giving and taking between gods and man. Also in this interchange of gifts the astragali obtained a vital position since it was a spin-off from the actual offering. One aspect that is important to stress in this connection are the "fees" that were required for participations in religious rites. It is interesting to see the gift to the priest as a crucial step towards the astragali presumable qualities as means of payment.

Shells have in their property of their appearance been carried as decoration and in some cases even developed into primitive money.⁴⁵ The decorative aspect is nevertheless not decisive to develop such qualities. The astragali would in principle, and in line with its magic and ceremonial sense, still gain these properties. As Laum writes, it is not often that the actual and valuable objects are in circulation, but other items that are emphasized through the attractive characteristics of those items.⁴⁶ In this case it is not exorbitant that the astragali as means of the animal it represented, was the main object. When discussing the spiritual world of the Mongolians it is interesting to see how the astragali symbolized the living animals themselves, many times to a degree that identified them with the bones. The possibly greatest indication on the astragali as a suitable medium of exchange is its parallel qualifications with the cowrie shell. The main difference between the use of astragali and the cowries is perhaps our knowledge of the latter being used as primitive money. In the historical and archaeological material, since more than five thousand years, we find the astragali and the cowries as burial deposits, as amulettes, in divination, games and as symbols of fertility. Both the cowrie shells and the astragali have also been copied in valuable materials⁴⁷ and various forms of shells have also been filled with lead.⁴⁸ A very distinct and interesting aspect is how these objects have been used as counters.⁴⁹

The properties ascribed to primitive money can after the study above, show that the astragalus owns the prerequisites suited for various payments. The bone had a practical value and as such also an intrinsic value. The practical use is found in qualities such as a gamepiece and a counter, but also as a medium for various religious institutions. The value of the astragalus was defined by the needs among different cultures. The intrinsic value of the bone was most probably not high considering it a knuckle bone, but its limitation to two per animal, should have made the bone coveted - a matter that makes the cowries less practical as primitive money. On the other hand the accessibility was far more restricted even though it makes the astragali extremely inflation-proof.

The sorts of payments that could have been made by the astragali is yet another important question to ask. What kind of objects could then have been exchanged for the bones? This question would have been very difficult to answer even if we would have allowed us to focus on a specific ancient culture. During the classical period in urban Greece and Italy, the astragalus seems to have had a more symbolic value aside that of a plaything, often associated with children.⁵⁰ One may therefore assume that its value of exchange was restricted to symbolic gifts or as an object of direct exchange in games, without any larger economical claims. While in certain Bronze Age cities, in for example the Syro-Palestinian area as in a case from modern time Turkey⁵¹ it was possible to exchange certain smaller items directly for the astragali in lack of a smaller divisible currency.

Established currencies that were used for payments should be classified after their flexibility and variety of use. Are they used in general or for specific payments with specified objects or services? Large parts of the primitive money are only convenient for certain kinds of payments within a given community.⁵² Most certainly it is within such circumstances of small commercial transactions that we ought to find the astragalus bone. Perhaps the 77 astragali found in the "wine shop" in Beycesultan from the Late Bronze Age period, could be a representative context for exchanging smaller goods of daily use.⁵³ An illustrating analogy from early 19th century Africa, shows how beads on thread could be used to purchase smaller provisions, in this case a small jar of beer.⁵⁴

It is very probable that the astragalus in certain communities or cultures only came to be recognized as currency within ceremonial contexts and not for exchanging smaller goods. Although, as long as the astragalus was a central element in games and above all in gambling, the likelihood is very probable that the object developed into qualities resembling that of money. It is within this latter aspect that the value of the astragalus most certainly was accepted as a medium of exchange without its spiritual background. As a counter, perhaps as in the case of Chwarism, the money exchangers could exchange the bone into a circulating currency or to a more widely accepted medium of exchange. With this background we might put forward the question of how other parallel

or earlier phases of cultures developed, cultures where you could win the bone but not change it into another currency. A self sufficient people like the Mongolians did not develop a need for primitive money other than the currency that emerged from the modern and urban society. Still it is exciting to see how the winnings in hazardous Mongolian games with astragali recently have been expressed in modern currency.

Quiggin writes⁵⁵ that it is difficult to draw a line between counters and primitive money. This means that the astragalus can be defined as primitive money in the cases where it was used as such. That this was the case in large parts of the Near East during the first millennium A.D. should be without doubt. Conceptually we could as a matter of fact conclude that astragali, at least in the Early Islamic cultural sphere, have been a kind of primitive money. The problem is rather how to define a borderline between a medium of exchange and that of primitive money. The latter enquiry must moreover be very important to give an answer to the question of when a popular medium of exchange becomes what historians of economy define as primitive money.

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¹ Cornwall 1974, 170-171, 177.

² Landenius-Enegren 1993, 91.

³ Hübner 1992, 49-50.

⁴ Macqueen 1975, 71.

⁵ Macalister 1912, 302.

⁶ Fischer 1995, 101; Hesse 1990, 214-215; Hubert & Zayadine 1989, 251-252; Lapp 1964, 26-30, 1948, 44-46; Macqueen 1975, 69-71; Saller 1966, 180; Young 1957, 321, 327.

⁷ Hübner 1992, 43-60.

⁸ Kabzinska-Stawarz 1983; 1985; 1991.

⁹ Kabzinska-Stawarz 1985, 243.

¹⁰ Bass 1967, 133; Kabzinska-Stawarz 1985, 241.

¹¹ Franken 1990, 44; Gjerstad 1960, 217-224; Pinney 1986, 218; Tufnell et al 1940, 93-94.

¹² Braekman 1981, 6; Karageorghis 1985, 388; Reiner 1960, 25; Ryder 1983, 313-314.

¹³ Fernholm & Steen 1983, 62; Boardman & Kurtz 1971, 209.

¹⁴ Tufnell et al 1940, 93-94.

¹⁵ Burkert 1985, 96.

¹⁶ Rosenthal 1975, 1.

¹⁷ Ibid. 175-176.

¹⁸ Brewster 1960, 16.

¹⁹ Lovett 1901, 28 1.

²⁰ Schaeffer 1962, 103, 105, fig. 64.

²¹ Amandry 1984, 347-380; Chavane 1975, 183-189; Emery 1938, 114; Hübner 1992, 46; Karageorghis 1985, 382-389; Larsson 1992, 15; Pecorella 1975, 50; Riis 1948, 35, 176; Robinson 1941, 502-504; von der Osten 1937, 427, 433; Young 1957, 327.

²² Kabzinska-Stawarz 1975, 143.

- ²³ Rosenthal 1975, 3.
²⁴ Ibid. 35.
²⁵ Kabzinska-Stawarz 1975, 239.
²⁶ Ibid. 258-259.
²⁷ Kabzinska-Stawarz 1991, 20.
²⁸ Kabzinska-Stawarz 1985, 246.
²⁹ Hogendorn & Johnson 1986; Quiggin 1949, 25.
³⁰ Nathorst-Böös 1988, 39-40.
³¹ Quiggin 1949, 293.
³² Einzig 1949, 309-318.
³³ Ibid. 310.
³⁴ Ibid. 317.
³⁵ Ibid. 317.
³⁶ Ibid. 370.
³⁷ Laum 1924, 23-24.
³⁸ Ibid. 61.
³⁹ Lapp 1948, 44-46.
⁴⁰ Togan 1939, 12, §9-10.
⁴¹ Rosenthal 1975, 35.
⁴² Brewster 1960, 16; Rosenthal 1975, 3.
⁴³ Rosenthal 1975, 3.
⁴⁴ Brewster 1960, 15.
⁴⁵ Hogendorn & Johnson 1986.
⁴⁶ Laum 1924, 59-61.
⁴⁷ Hübner 1992, 46; Tait 1982, 38-40; Quiggin 1949, 29.
⁴⁸ Karageorghis 1985, 382-389.
⁴⁹ Quiggin 1949, 26.
⁵⁰ Golden 1990, 53-54.
⁵¹ Young 1957, 327.
⁵² Einzig 1949, 330.
⁵³ Lloyd 1972, 12.
⁵⁴ Quiggin 1949, 102.
⁵⁵ Quiggin 1949, 26.

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