

18 The Beginnings of Chess

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In this paper a survey is offered of four interrelated questions concerned with the beginnings of the game of chess. Where did chess begin? How did chess begin? When did it begin? From what did it develop?

The principal problem that arises in examining these questions is that chess historians tend not to be experts in ancient Indian or Persian history or philology, nor indeed are they archaeologists, and their views are based at best on second- or third-hand information about those subjects. In addition, information may well be out of date, and often appears, on further examination, to be suspect. I propose to report and comment on the theories which have been put forward by others and to highlight what appear to me to be the strengths and weaknesses of those theories. I have been greatly assisted in this respect by advice and assistance which I have received from a number of experts in different fields, some of whom are acknowledged further in the footnotes to this paper.

In 1900 Daniel Willard Fiske wrote:

Before the seventh century of our era, the existence of chess in any land is not demonstrable by a single shred of contemporary or trustworthy documentary evidence ... Down to that date it is all impenetrable darkness.¹

The first proposition is still true today. And although there has been a great deal of speculation as to when and how chess evolved, little light has been shed on the darkness which Fiske found so impenetrable.

In order to consider the available evidence, it is necessary to remember that, in the period with which we are concerned, the game was not played with the same pieces or the same rules as today. The names and the moves of the pieces when we first encounter them (in Persia, in the *Chatrang-namak*, around AD 750–850) were different in many respects. Instead of the queen there was a counsellor or adviser, which was one of the weakest pieces on the board, being able to move only one square diagonally. Instead of bishops, we find elephants, able to move only two squares diagonally, so that each of them could cover only eight squares on the board. Castling was unknown, and instead of castles at the four corners of the board we find *rukhs*, with the same moves as the modern rook. The *Chatrang-namak* offers no description of the *rukha*, although it describes every other piece. It is uncertain what it represented, but, as we shall see, in India the equivalent piece was a chariot. The horses had the same moves as the modern knight, but the pawns or footsoldiers had yet to enjoy the advantage of the initial double leap.

¹ In *The Nation* (New York), 7 June 1900: 436.

The evidence

The available evidence is partly documentary, partly archaeological, and partly internal, to be derived from the nature of the game itself insofar as we are able to work out how it was first played.

Documentary evidence presents problems both because of its sparsity and because the oldest surviving texts are, or purport to be, copies or quotations made centuries after the original works were composed. It is necessary to bear in mind that there are cases where an author has deliberately sought to give his own writings greater authority by putting his own words into the mouth of a respected author of antiquity.² There are also cases where old stories have been modified to correspond with the expectations of a later age. However, for the purpose of this paper it has been assumed here that such copies and quotations are broadly accurate, and that there have been no later modifications except where the contrary has been suggested.

Archaeological evidence is sparse, and where it exists, as we shall see, it is unhelpful or suspect, and sometimes both.

Internal evidence for the way the game was played provides some insight as to how chess may have achieved the form in which it spread through Central Asia and Persia to the Arab world, but does not answer the question of when it achieved that form or from what it developed.

Where did chess begin?

The rival contentions

No serious argument has been put forward that chess began anywhere but in Asia. Hyde 1694 identified India as its place of origin, and until relatively recently there has been a substantial, though not total, consensus among writers on the early history of chess that it began somewhere in the north-western part of the Indian sub-continent.

Arguments in favour of a Chinese influence have been put forward in Needham 1962, and Bidev 1986 and 1987, and a Chinese origin has been argued in Li 1998; a Persian origin has been propounded in Bland 1851 and in Yekta'i 1970, and an origin somewhere on the Silk Road or in the Kushan Empire has been suggested in Josten 2001. Calvo 1998a, while declining to identify any other area as the place from which chess came, specifically identifies India as the place from which it did not come. These works attack the evidence in favour of an Indian origin as at best inconclusive, identify alleged deficiencies in the Indian theory, and, with the exception of Calvo 1998a, advance the merits of an alternative solution.

² Chakravarti 1938: 275–6.

In addition, arguments as to pro-Indian prejudice have been advanced against those advocating an Indian origin for chess. I do not regard these arguments as leading anywhere. Whether or not a writer was prejudiced in favour of an Indian origin or any other origin, his arguments must be judged on the basis of the evidence and arguments advanced. A prejudiced approach, if it exists, ought to lead to greater caution in considering the evidence, but it does not affect the weight of that evidence when it has been properly evaluated.

Arguments can carry only as much weight as the evidence they adduce and the logic of the deduction. By way of example, a possible Babylonian origin for chess was suggested, very tentatively, in Gadd 1939, based on his reading of a Seleucid-period cuneiform tablet of the third century BC. According to Finkel 1991, the tablet was misread by Gadd, and once correctly read has nothing whatever to do with the use of a game board, be it for a war game or divinatory purposes.

So, too, one does not have to look for prejudice, although it may well be present, to reject the thesis in Li 1998 as to the Chinese origin of chess in the early centuries BC, since it is based almost exclusively on claims advanced to a visitor to that country some two millennia later – evidence on a par with European claims that chess was invented by Palamedes. Some pro-Indian claims are no better. One finds in the ‘Conclusions’ in Bhatta 1994, for example, the statement that ‘Halayudha’s reference to “caturanga” occurs in his commentary on Pingala’s work. As Pingala is placed in the second century BC [although this commentary was written at the end of the tenth century AD] it may be said that the game existed long before Pingala. The invention of chess must be attributed to an Ancient Indian sage and not to Draupadi or Mandodari as found in the myths.’

As will appear below, there is real evidence in favour of India which, while not conclusive, is stronger than that against it, and stronger than the case for any other place of origin.

The case in favour of an Indian origin

The Indian case is that chess originated in the Indian sub-continent in or before the early seventh century AD, where it was known as *chaturanga*. *Chaturanga* or *caturanga* originally meant four elements or arms, and the term had been used in Sanskrit literature from an early date to describe the four parts of the Indian army: elephants, cavalry, chariots and foot soldiers. These were also the pieces, together with the rajah and *mantrin* or counsellor, which were used in the game of *chaturanga*, which was thus a representation on the board of a conflict between Indian armies.

At an early stage, *chaturanga* lost the original connotation of four parts, and was used simply to mean ‘army’. It was so used, for example, in the Code of Manu, about AD 200, where there is a specific reference to a *chaturanga* of six parts. The additional parts were the general and the camp followers, and stress was laid on the dependence of the army on the *mantrin*. The loss of the original specific numerical connotation is not unparalleled (compare English ‘quarantine’, ‘squadron’ or ‘decimate’, for example), but the point seems to have been overlooked by a number of writers who assume that *chaturanga* meant ‘four parts’ at all times.

3 See Thieme 1962: 208.

Bock-Raming 1993 and 1996 also points out that the inviolability of the king in chess reflects the position of the king in Indian warfare as early as the last centuries of the first millennium BC: ‘the Indian king has a god-like position. In battle, he was the one who directed the military actions but did not play an active role in fighting. Within the army, he occupied a position where his life was safe. It is this aura of sacrosanctity which is symbolically expressed in the chess rule ‘the king must not be taken’. On the battlefield, this rule may have been more honoured in the breach than its observance, but the same temptations to disregard it are not present in a game.

The name of the game in adjoining countries appears to be derived from *chaturanga* – *chatrang* in Persian, *shatranj* in Arabic, *chanderaki* in Tibetan are examples. This suggests that the game, as well as its name, came from India. Also, as will appear, it was believed in Persia that the game arrived there from India. By contrast, the earliest surviving Indian texts which give details of the game appear to be specifically Indian in language and concepts, as Wakankar 1986 points out in relation to the *Balakahitabuddhibalakridanam*, and as Bock-Raming 1994 points out concerning the *Manasollasa*. The *Balakahitabuddhibalakridanam* is dated by Wakankar to about the tenth to twelfth centuries AD, and the *Manasollasa* dates from the beginning of the twelfth century. So too, the brief earlier references in the *Haravijaya* and the *Nitivakyamurta*, which date from the tenth century AD, are, as we shall see, purely Indian.

Those arguing that chess came from India have assumed that it began in the north-west of the sub-continent, there being no evidence of early chess from elsewhere in India.

When and how did chess begin, and from what did it develop?

Chess is known to have existed by the seventh century AD, and it is generally accepted that it had existed for some time earlier. How much earlier has been the subject of dispute, with estimates ranging from about 3000 BC to about AD 570. There is no evidence to support the very early dates, and it is difficult to see any basis for a date earlier than about AD 400.

It has been variously contended that chess developed from some other form of game, from divination techniques or rituals, from army training exercises using miniature units on a grid, or even from mathematical exercises using a board of 64 squares. If chess began in India, there is also the question – which would not arise if it originated elsewhere – whether it was initially a two-handed or four-handed game.

Indian literary and archaeological sources

Literature

Only five passages have so far been found in Indian literature which certainly antedate AD 1000 and which clearly refer to *chaturanga*. The earliest of these literary references dates from about the second quarter of the seventh century AD, although a gaming board of 8 × 8 squares, the *ashtapada*, was known at least as early as the second century BC, when it was described by Patanjali.³

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Patanjali also describes elsewhere a game in which pieces move clockwise and counter-clockwise. This has often been taken to refer to backgammon. Thieme 1962 argues that it cannot refer to backgammon because the rules described by Patanjali do not correspond precisely with any known rules for that group of games. Although he may be right, his argument is unconvincing. Rules of games evolve, and if we do not know the particular rules of a certain period we cannot assume that they must have been the same as those at any later date.

Thieme's additional argument, that the rules described by Patanjali are those of chess, is extraordinary. It assumes that, however obscure an allusion to a game may be, if is not a reference to backgammon, it must be to chess. He plays down and virtually ignores the obvious alternative, that the game alluded to is neither chess nor backgammon.

Similar objections apply to other references to games taken by Thieme 1962 as indicative of chess. Thus he says a passage which refers to a player giving a piece neglectfully cannot be a reference to backgammon, but must refer to a game which depends solely on skill and not at all on luck. The reference could equally well be to a game which is part skill and part luck, such as backgammon. But even if this were a game of pure skill, there is no reason to suppose that it is chess. Thieme 1994 repeats but does not expand upon his earlier position.

All that we can derive from the passages cited by Thieme is that board games which depended at least partly, and possibly wholly, on skill were known in India by about AD 300, and that one of the uses of the *ashtapada* was as a surface on which dice were thrown for a game involving pieces. Unless they were stable enough not to be affected by the dice, the pieces themselves are unlikely to have been placed on the *ashtapada*, since the dice would have disturbed them.

Further, Syed 1995 and 1998b point out that the absence of any reference to *chaturanga* in Indian texts of the early centuries AD, in texts where one would expect to find such references if chess existed, is a strong indication that chess did not yet exist. She cites such writings as the *Kamasutra*, *Arthasastra*, *Nitisara* and *Mahabharata* which, she maintains, one would expect to contain such evidence. While accepting that no precise date could be given for the appearance of *chaturanga*, Syed 1995 concluded that it probably began early in the fifth century, although in Syed 1998b she moved to a date early in the sixth century.

Murray 1913 suggests that a passage in Subandhu's *Vasavadatta*, written at the beginning of the seventh century AD, is likely to be a reference to chess, although neither the name of the game nor the chess board is mentioned. The passage describes the rainy season as follows: 'The time of the rains played its game with frogs for *nayadyutair*, which, yellow and green in colour, as if mottled with lac, leapt up on the back of the black field (or garden bed) squares'. Murray 1913 accepted the translation of *nayadyutair* as chessmen without explanation, beyond remarking that pieces in a race game

would have been given another name.⁴ Even if he is right in this, it does not follow that the reference is likely to be to chess, and Eales 1985 points out that the term could equally well be translated more generally as 'gambling pieces.'⁵

The first clear literary reference to chess, and the only one which definitely antedates AD 850, is a passage in the *Harshacharita*, a contemporary account of the life of Harsha, the ruler of most of Northern India between AD 606 and 648. In it the author, Bana, writes that: 'under this monarch ... only bees (*shtapada*) quarrel in collecting dews ... only *ashtapadas* teach the positions of the *chaturanga*.'⁶

The linking of the *ashtapada* with *chaturanga* in the passage quoted shows that the connection was well enough known at the court of Harsha for a casual reference of this type to be understood. *Ashtapada*, as we have seen, is the name for the sixty-four square board (8 × 8) on which *chaturanga* was played. The passage in question plainly indicates that there was peace in Harsha's kingdom. It follows that the work cannot have been written before AD 621, for it was only then that peace was established, and it may not have been written until well into the second quarter of the seventh century AD.

One cannot assume from this passage alone that *chaturanga* was already a game at that stage – the passage refers to *ashtapadas* teaching the positions of the *chaturanga*. If the theory that games derive from divination rituals is correct, the reference could be to rituals rather than to a game. It could also refer to a system of teaching mathematics, as Calvo 1994a and 1994b argues, or to the practice of army manoeuvres, as suggested by Syed 1995 and 1998a and b. It seems likely, however, taking into account evidence of the spread of the game beyond India in the seventh century AD, that it was already a game in India as well. If the game was not Indian in origin, then we must conclude either that this was the imported game, or that Indians independently devised army manoeuvres or some other non-game called *chaturanga* on an 8 × 8 board, which subsequently turned into a game similar to that which had, hypothetically, developed independently in some other part of Asia. This last possibility seems implausible in the extreme, and one can therefore assume that the reference by Bana is to some form of the game.

Three of the other known references to chess in literature which clearly predate AD 1000 are from Kashmir. The first is an allusive reference in the *Harajivaya*, or *Victory of Siva*, written in about AD 850.⁷ The second, from the *Kavyalankara*, written by Rudrata in about AD 900, gives three chess puzzles. Here, certain syllables are placed in the various squares of a half-chess board in such a way that whether the syllables be read straight across as if there were no chess board or in accordance with the moves of a particular piece, the same verse is obtained. These show the moves of the horse and the chariot to be the same, so far as they appear from the puzzles, as the moves of the modern knight and rook. The elephant's moves are more difficult to follow.⁸ In some respects, however, they are similar to those of the

4 Murray 1913: 51–2.

5 Eales 1985: 28.

6 As quoted in Murray 1913: 52.

7 Quoted in Murray 1913: 53.

8 Murray 1913: 54–5. See also now Rajendran 2001: 26–8.

elephant in a four-handed variety of chess described by al-Beruni in about 1030.⁹ The third reference is a brief allusion to the game of *chaturanga* found in Halayudha's commentary on Pingala's *Chandrasutra*.¹⁰

Finally, there is the passage in *Nitivakyamurta* 18: 1–4, cited, as it seems for the first time, in Syed 1998a, to the effect that in *chaturanga* one does not have a king without an advisor. This is significant in relation to the dispute whether two-handed or four-handed chess came first, since in four-handed chess, as it is known to have been played in India, there is no advisor, each player using half of one side from a two-handed game, with the advisor from the two-handed version being treated as a king. This makes it plain that the *chaturanga* referred to here was the two-handed game.

By the time of the *Chatrang-namak* (about the 8th or 9th century AD),¹¹ *chatrang* was a two-handed game of skill which was believed in Persia to have been introduced as a game from India many generations earlier. It would seem from the numerous references to chess attributed to Islamic writers from the mid-seventh century onwards, cited in Murray 1913 and in Wieber 1972, that chess had spread westwards from Persia soon after its conquest by the Arabs between AD 638 and 651.¹² If so, it must have spread from India by the mid-seventh century, though it may be that these attributions are simply an attempt by later Islamic writers to associate chess-playing with the early days of Islam. The Islamic references, insofar as they tell us anything about chess, also indicate that it was a two-handed game of skill.

With the exception of the passage from Rudrata referred to above, we have no documentary evidence before AD 1000 for the moves of the pieces in India or the object of the game.¹³ We cannot assume that the moves were necessarily the same as in Persia or Baghdad in the eighth and ninth centuries. Indeed, we are told by al-Adli of changes which may have occurred – see p. 142 below. However, apart from differences in the moves and positioning of the elephants and chariots, the moves of the pieces in India, when we do learn of them, are essentially the same as in Persia and the surrounding countries. There is no reason to suppose that, with the possible exception of the elephant and chariot, the

Indian moves differed greatly from the Persian ones in the eighth and ninth centuries.

Archaeology

Archaeological evidence for chess in India is almost non-existent. Gaming pieces have been discovered in Lothal and Mohenjo-Daro, in north-west India, which date from 1600 BC and earlier, and which resemble abstract Indian chess pieces of the seventeenth century onwards.¹⁴ These pieces were seen in Petzold 1990 as evidence that the games which existed four to five thousand years ago on the banks of the Indus were at least precursors of chess. He asserted that the traditional conclusion that chess originated in the sixth century AD was superseded as a result of the discovery of these pieces. But he appears to have placed undue reliance on their shapes, and in Petzold 1994 he considerably modifies his stance. There is no evidence that any game played at that early time bore any resemblance to chess, and indeed no evidence exists in Rao's excavation reports that gaming pieces of different shapes were even found together.

It is by no means uncommon for similarly shaped pieces to be used for more than one game. The shapes of gaming pieces are to a considerable degree determined by the functions which they are to serve and the tools available to make them. The published specimens show only that board games were played and that more than one type of piece and more than one type of board were in use.

There are a few early individual figurative pieces which would constitute plausible chess pieces if chess existed when they were made. The earliest is a small northern Indian carving of an elephant illustrated in Dwivedi 1976, who states that it is believed to be of the Mauryan period, about 300–200 BC.¹⁵ There is also a small carving of a chariot, 1.7 cm high, excavated at Mantai in Sri Lanka and now in the Archaeological Museum at Anuradhapura, which is illustrated in van Lohuizen 1981 and attributed there to the second or third century AD. In addition, van Lohuizen 1981 illustrates two ivory carvings of an elephant and rider attributed to north-west India, of the late seventh to ninth centuries. One of these carvings, now in the Museum für Indische Kunst in Berlin, is similar to, but smaller than, the well-known piece in the Bibliothèque Nationale in Paris.¹⁶ Van

in seven verses dealing with two-sided chess, which has been assigned to the tenth–twelfth centuries. This may be the same as the *Balakahitabuddhibalakridanam* attributed in Wakankar 1986 to about the tenth–twelfth centuries. It is a small work of seven verses, with a commentary by Bhamini appended at the end of the Marathi edition of the work entitled *Caturangavilasamananjari*. It is said to be meant for children and gives details about the chess board, arrangement of the pieces, their movements, varieties of victories, revival of dead pieces, etc., and is claimed not to contain a single Persian word, suggesting composition prior to the Muslim period. The other work is the *Buddhibala or Sataranjakutuhala*, a work in ten verses, several manuscripts of which are to be found in the Asiatic Society of Bengal. Chakravarti 1938 gives no information on this work, except to say that it appears ancient. It was published in 1981 in the *Baladeva Upadhyaa Felicitation Volume: 145–50* (Hindu section), but does not seem to be regarded by Wakankar 1986 as having any significance.

14 Rao 1973: 112–13 ad pl. XXXIV A and B; Rao 1985 vol. 2: 502–11 and accompanying plates.

15 Dwivedi 1976: 61 and pl. 33.

16 As to the history and origins of this piece, see Welch 1985 and Pastoureau 1990. For other similar pieces, see Linder 1992.

9 Murray 1913: 57–9

10 Murray 1913: 55–6.

11 In Bidev 1987 it is stated that the *Chatrang-namak* and *Karnamak* are assigned in Meissenburg 1976 to the eighth century AD, while in Bidev 1986 GS: 208, it is stated that Meissenburg 1976 dates *Chatrang-namak* to 850 and *Karnamak* to between 750 and 850. I understand that the dating of these texts is extremely difficult, but it does not help that Bidev relies on another non-expert for the dating of these documents, and in addition misquotes him in at least one of these passages. See further nn. 21–22 below.

12 A volume by Wadad al-Qadi on the letters of Abd al-Hamid al-Katib quotes one of these letters in translation as containing a reference to chess. Abd al-Hamid al-Katib was an Iraqi born around AD 686 who wrote official letters for the Umayyad caliphs, and if the quotation is accurate it indicates that chess had reached Baghdad by the date of the letter, about AD 720 [written communication from Anna Contadini dated 10 February 1993]. The letter does not appear to be referred to in Murray 1913 or Wieber 1972.

13 There are two other works cited in Chakravati 1938 which refer to chess and which may antedate AD 1000, but to which I have not had access. The first is the *Buddhibalasaptaka*. This is a small work

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Lohuizen 1981 also refers to various small elephants and horses which have come to light at early Indian sites and have hitherto been interpreted as toys.

However, not every carving of an elephant, chariot or horse is a chess piece. Even if the dating of these pieces is correct, there is no real evidence that they are chess pieces rather than toys or other gaming pieces: indeed there is no certainty that they are connected with any game. As for the two pieces attributed to the seventh to ninth centuries by van Lohuizen, the dating must be as open to question as the various dates from the seventh to the fifteenth centuries which have been attributed to the piece in the Bibliothèque Nationale.

Finally, Murray 1913 illustrates objects now in the British Museum which were found in 1855–6 in excavations at Baambra-ka-thul, and which were then believed to be chessmen of the early eleventh century. These objects bear a passing resemblance to Victorian pegged travelling chessmen, but it is reasonably clear on examination (and now accepted at the British Museum) that they are not chessmen at all, but probably came from items of furniture.¹⁷

Non-Indian literary and archaeological sources

Literary references

The famous chess player and writer al-Adli, writing in about AD 840 in Baghdad, is quoted in a later manuscript as stating that the Persians altered some of the rules of Indian chess when they took it over.¹⁸ One of those changes was in the positioning and moves of the elephant. In Indian chess, al-Adli is said to have stated, the elephant is placed in the corner and 'omits one square in a straight line to jump into the second in a straight line. And this it does in all the squares of the board. Each elephant has sixteen squares, and the company of elephants can get into all the squares of the board without collision. But in the form of chess which we have taken from the Persians, and which is played now, the elephants have only half the board, and each elephant has eight squares. The number of squares has been reduced because they go slantwise'.

Murray 1913 suggests that the diagonal move of two squares, described by al-Adli as a change made in Persia, is the oldest move of the elephant, being the only one which passed westwards and being also the move which still exists in China.¹⁹ This assumes that it was the oldest form of the move which passed from India to the outside world, whereas it is perfectly possible that before the game spread from India there already existed in different parts of India varieties of the game in which the elephant had different moves.

According to Murray 1913,²⁰ the earliest mention of chess (he should perhaps have said *surviving* mention) occurs in the *Karnamak-i Artachser-i Papakan*, that is the book of the deeds of Artachser son of Papak, the founder of the Sassanian dynasty, who ruled in Persia from AD 226 to 240. The *Karnamak* is believed to have been written about AD 600, but

the earliest existing manuscript is of the fourteenth century, and, as Murray 1913 points out, the evidence for this is tenuous. Artachser is said to have been more skilled than all others in ball play, horsemanship, *chatrang*, hunting and other accomplishments. Although there are references to these other types of skill elsewhere in the *Karnamak*, there is no other reference to *chatrang*, and Meissenburg 1976 suggests that the list of accomplishments, or at least the reference to *chatrang*, was probably added not earlier than 800–850, reflecting the concepts of that later age.²¹ The reference shows that by that time *chatrang* was a recognised accomplishment of a courtier at the Persian court, but like the reference in the *Harshacharita* it tells us nothing of how the game was played or with what pieces.

If the suggestion in Meissenburg 1976 is wrong and the reference was in the original *Karnamak*, then this would show that *chatrang* was well established in Persia at that time, so that, if the Indian theory is correct, *chaturanga* must have already been in existence in India before the end of the sixth century AD. The fact that the *Karnamak* purports to record the deeds of a ruler four centuries before it was written does not mean that the courtly skills recorded in it were of an earlier age.

Another Persian text, the *Chatrang-namak*, contains more information about the game. This was believed by Murray 1913 to date from between AD 650 and 850.²² Meissenburg 1976 states that later scholarship has narrowed these dates to about AD 700–800, but Brunner 1978 suggests that it was probably written down in the ninth century AD, and that it may have flourished in essentially the same form as a courtly tale transmitted orally from the sixth century.

The earliest surviving copy is a manuscript of AD 1323.²³ It contains an account of the introduction of chess into Persia from India in the reign of Khusru I Nurshivan (AD 531–78). The game is said to have been devised by 'Dewasarm, the great ruler of India'. The pieces are said to have consisted of sixteen emerald and sixteen ruby-red men. The game was described as follows in the translation used by Murray 1913:

Dewasarm has fashioned this chatrang after the likeness of a battle, and in its likeness are two supreme rulers after the likeness of Kings (shah), with the essentials of rooks (rukhs) to right and to left, with Counsellor (farzin) in the likeness of a commander of the champions, with the Elephant (pil) in the likeness of the commander of the rearguard, with Horse (asp) in the likeness of the commander of the cavalry, with the Foot-soldier (piyadak) in the likeness of so many infantry in the vanguard of the battle.²⁴

The same passage in the more recent translation of the *Chatrang-namak* in Brunner 1978, where it is given the title of *Wizarishn i catrang ud nihishn i new-ardashir (Explanation of Chess and Invention of Backgammon)*, does not differ in any material way from this translation.

The game described is clearly the two-sided game, and the absence of any reference to dice suggests that it was a game of pure skill. It is said to have been devised by several wise

makes it unlikely that the reference can be later than about AD 850.

²² Murray 1913: 150; Murray 1936 dates it between AD 560 and 750.

²³ Murray 1913: 151.

²⁴ As translated at Murray 1913: 151.

¹⁷ Murray 1913: 88, and see now especially Contadini 1995: 142, appendix III with fig. 55.

¹⁸ Murray 1913: 57.

¹⁹ Murray 1913: 59–60.

²⁰ Murray 1913: 149.

²¹ The use of the word *chatrang* rather than the Arabic *shatranj*

men of India, and to have led to the invention by the Persians of *nard*, or backgammon. According to the translation in Murray 1913 the Persians were challenged to 'discover the interpretation of the *chatrang*'. Brunner 1978 translates the same passage as 'explain the rationale of chess'. He further explains that the word *cim*, which he translates as 'rationale', is a significant philosophical term referring to the game's underlying truth.

The *Chatrang-namak* is also of interest for the way in which the various aspects of the game of *nard* are related to the cosmos. The black and white pieces are compared with night and day, their movements with the movements of the constellations and with the revolution of the firmament. The spots on the dice are compared with the creator (one), heaven and earth (two), words, works and thoughts (three), the four humours of man and the four points of the world, the five lights, that is the sun, the moon, the stars, fire and the light which comes from heaven, and the creation of the world in the six eras of the *Gahanbar*.

Brunner 1978 draws attention to three features of the work which he says relate it closely to the time of Khusru I Nurshirwan, even if they do not fully prove the date of composition. First, he points out that in that reign the physician Burzoe undertook a mission to India and translated into Middle Persian the collection of Sanskrit allegorical tales known as the *Pancatantra*, the frame narrative of which features an Indian king called Devasarman, apparently the same character as the Dewasarm of the *Chatrang-namak*.

Second, he states that the reign of Khusru I Nurshirwan was a period of diverse intellectual activity at the court, which included the study and advancement of astronomy and astrology, and the awareness of astrology shown by the *Chatrang-namak* would have been appropriate for that time. Finally, he observes that the alleged hero of the *Chatrang-namak* is the alleged vizier of Khusru I Nurshirwan, whom Murray 1913 transcribes as Wajurgmitr and Brunner gives as Wuzurg-Mihr (Arabic Buzurjmihir), who is consistently associated with the science of the heavens, and to whom is doubtfully attributed a collection of religious apothegms. Brunner 1978 draws attention in particular to the emphasis placed in that collection on the term *cim*, an approach that would make the game of the intellect attractive in comparison to one of luck. It questions, however, the attempt which had been made in Christensen 1944 to link Burzoe with Wuzurg-Mihr.

The link between Dewasarm and the mythical Devasarman is certainly striking. But what is not clear from Brunner 1978 is how long the enthusiasm for astrology and the philosophical concepts to which he refers held sway in Persia. If they remained in vogue in the succeeding centuries, as seems likely, then the legend (and Brunner 1978 accepts that it is no more than a legend) could easily have developed much later.

In the *Shahnama*, written by the Persian Firdausi between AD 975 and 1011, a similar account is given of the introduction of chess into Persia, but with some differences.²⁵ The seat of government of the Indian king is given as Kanauj, a city

occupied by Harsha as his capital. In this version the Persian are invited to discover not the nature of the game (it was explained to them as a battle game) but the moves of the pieces. On the face of it this is an impossible task, as there is nothing in the nature of the pieces as divisions of the Indian army which can enable either the initial positions or the moves of the elephants, horses and chariots to be deduced. Finally, the pieces are described as being of ivory and teak.

Although, as Murray 1913 points out,²⁶ Kanauj was a large and famous city in India and could have been added to the story in the course of time,²⁶ the references to the city of Kanauj in the *Shahnama*, together with the reference to Dewasarm in the *Chatrang-namak*, led Bidev 1987 to suggest that it was in Harsha's reign that *chaturanga* was devised as a game, and that the Persian king to whom the game was sent was Khusru II Parwiz (590–628).²⁷ Bidev suggests that Dewasarm may be a Persian corruption of Deva Harsha, and that the fall from grace of Khusru II Parwiz following his defeat by the Byzantine army in AD 627 and the total destruction of the Persian kingdom led to the subsequent legend substituting Khusru I Nurshirwan.

This attribution is unconvincing and Syed 2000a and 2001 demonstrate that the Maukhari king Sarvavarman is far more likely to have been the Indian king of this story and of the *Pancatantra*. Sarvavarman reigned in Kanauj between about AD 560 or 565 and 585, and his reign thus overlapped with that of Khusrau Anushirvan in Persia. Syed points out that Indian kings always bore the title *deva*, 'god', 'lord', and that on his coins Sarvavarman is called *deva sarvavarmma*, a name which could easily have been corrupted to Devasarm in Persia. She also shows how the two kings could easily have exchanged delegations.

If, as Brunner 1978 suggests, the *Chatrang-namak* in oral form dates back to the 6th century, then its account of the introduction of chess to Persia could be a contemporary or near contemporary account, rather than the legend it has generally been assumed to be.

Additional evidence that chess had reached Persia not later than the first half of the seventh century is to be found in the numerous references to chess attributed to Islamic writers from the middle of the seventh century onwards, cited in Murray 1913 and in Wieber 1972, from which it appears that chess had spread westwards from Persia soon after the latter's conquest by the Arabs between AD 638 and 651. While the surviving sources are again later manuscripts, the number and nature of the references makes it likely that some at least of them have a factual basis.²⁸

References in Persian and Arabic sources to the Indian origin of chess

There are several legends to the effect that chess came from India. Some of them, such as that in the *Chatrang-namak*, could be of a date sufficiently close to the time of supposed introduction to indicate that legends have some factual basis. It has been contended in Yekta'i 1970 and Calvo 1998a and 1998b, however, with differing degrees of emphasis, that the early accounts did not necessarily refer

²⁵ See Murray 1913: 155–7.

²⁶ Murray 1913: 156 n. 17.

²⁷ Bidev 1987: 214.

²⁸ See those cited in Wieber 1972, and see also above, n. 12.

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to India. The principal argument for this seems to be that the name of Hend, said to have been used in the legend, was given to India by the Muslims in about the eleventh century, that India was never called Hend at any relevant time by the Indians themselves, and that until about the eleventh century the only place called Hend was Xusestan in south-east Iran and part of Iraq. Thus they argue that it is this place, and not India, to which early writers were referring.

This is wholly unconvincing. The references to chess coming from India are to be found in manuscripts of a later period purporting to quote al-Adli (about AD 840), al-Masudi (AD 947) and Firdausi (about AD 975–1011). By the time these manuscripts were written, Hend was clearly the name used for India, and if it is the name used in the relevant manuscripts (I am not clear whether these scholars have examined them; in the case of Yekta'i 1970 I have had to rely on a very incomplete translation), it is explicable as a modernisation of an old text.

In addition, it is clear from the context that the references are to the Indian sub-continent. Firdausi specifically identifies Kanauj, Sarvavarman's and Harsha's capital, as the source of chess, and whatever may be said about the basis for that attribution, it shows clearly that Firdausi, in recounting the legend, understood it to mean that chess came from India.

Al-Adli is quoted (in MS 'Abd al-Hamid I, Constantinople no. 560, written in 1140)²⁹ as saying:

It is universally acknowledged that three things were produced from India, in which no other anticipated it, and the like of which existed nowhere else: the book *Kalila-wa-Dimna*, the nine cyphers with which one can count to infinity, and chess.³⁰

The *Kalila-wa-Dimna* is the Sanskrit *Pancatantra*.³¹ It follows, then, that al-Adli too must have understood the source of chess to be the Indian sub-continent. The name of the Indian king, Dewasarm, in the *Chatrang-namak* also clearly connects *chatrang* with King Devasarman in the *Pancatantra*, and thus with India. Murray 1913 reserved judgement on this point, but seems to have had access only to the Arabic translation and not to the Sanskrit original.

Al-Masudi wrote to the same effect in his account of the reign of Nurshiwān:

He had sent from India the book *Kalila wa Dimna*, the game of chess, and a dye called *hindi* which dyes the hair to its roots a brilliant and permanent black.³²

In these circumstances, whatever weight is attached to the tradition, it is abundantly plain that the area referred to is the Indian sub-continent.

Archaeological sources

Although abstract Persian pieces are known from the eighth century AD, which are very similar to the basic playing pieces used throughout the Middle Ages from Persia to the Atlantic, they do not shed any further light on the origins of chess, except insofar as the absence of earlier pieces might suggest that chess was not then known or at least was less popular than later.

Figures of an elephant and a bull zebu excavated in Uzbekistan and dated to the second century AD have been put forward as chess pieces,³³ but while I have no reason to doubt their dating, there is also no reason to suppose that they were chessmen. The same comments apply to the two other individual pieces illustrated in Linder 1979 and dated there to the sixth or seventh centuries AD.³⁴

More significant are seven figures excavated in Afrosiab, near Samarkand, in 1977 by an expedition from the Institute of Archaeology of the Uzbek SSR led by Dr J. F. Burjakov. These pieces were dated, by reference to other objects found in the same cultural stratum, as having been deposited in the eighth century AD, although their state of wear suggested that they may have been made as early as the seventh century.³⁵ They are clearly chessmen, and include an elephant, a chariot with two armed men drawn by two horses, another chariot with one unarmed man drawn by three horses, a rider on a horse, two footsoldiers and what appears to be a rider mounted on a cross between a horse and a lion. The pieces provide additional evidence that chess had spread widely in Asia at an early stage. They do not, however, provide any evidence that chess originated earlier than the seventh century, nor do they provide any evidence as to how it originated.

Two Italian finds are more curious, and show how easily historians can be led astray by misleading information. The first of these finds was in the catacombs of San Sebastiano in Rome. It consisted of eight abstract pieces of the type found throughout the medieval world, two ivory kings, an ivory queen, a bone knight, two bone bishops and a much smaller ivory bishop. They are held in the Museum of the Vatican Apostolic Library, and appear from the varying sizes to come from at least two distinct chess sets. There is no information available as to the date (or dates) and circumstances of their discovery except that they were found in those catacombs between 1892, when the San Sebastiano excavations commenced, and 1930, when official records began.³⁶

Chicco³⁷ seeks to date these pieces to the third or fourth century AD on the basis that the catacombs do not appear to have been used as cemeteries after that time, and he suggests that they might have been brought back to Rome by a soldier returning from war in the East. But any dating based on this scanty information can only be treated with the greatest

29 See Murray 1913: 171.

30 As quoted in Murray 1913: 57.

31 Murray 1913: 154 n. 12 and sources quoted there.

32 As quoted at Murray 1913: 154. Another quotation at Murray 1913: 215, from an Arabic manuscript of AD 1419, is to the same effect.

33 Linder 1979: 18–19, although Linder himself is unconvinced by this attribution.

34 Linder 1979: 22–3. See also Eder 1994a.

35 Linder 1979: 24–5; for colour photographs of these pieces see Burjakov 1994: 62–71. Earlier Russian researchers had concluded that chess was introduced into Central Asia in the seventh century

AD; see Chodjaev and Djummel in *Schachmaty in SSSR* for 1951, nos 10–11 and 1952, no. 5. The 1951 articles had been criticised by P. Ivanov in *Pravda*, 25 December 1951, and the 1952 article was a reappraisal in the light of that criticism. The entire matter was then reviewed by Maiselis in *Schachmaty in SSSR* 1952, nos 10 and 12. The conclusions in these articles are summarised in Chicco 1953.

36 Sanvito 1992, where the museum numbers 2179–2187 are given; see Chicco 1978.

37 See Chicco 1953 and Chicco 1978.

caution, particularly when it conflicts with all the available evidence about the origin and spread of chess.

The second find is said to have been made in Venafrò, the site of a small settlement in the district of Campobasso in southern Italy. It appears that in 1932 builders were sinking a well when, at a depth of about three metres, they shattered an urn, revealing human bones. At that stage the authorities were called in, and various objects were removed.³⁸

Either the authorities assumed or they were told by the builders that the chessmen came from within the urn, although their recent carbon dating to a much later period, to which I shall return, makes this improbable. The pieces are not objects which would have prompted builders to summon archaeologists had they been found at an earlier stage of the dig and it seems very possible that this was the case.

The museum authorities in Naples, to whom the discoveries were handed, had no idea what they were. It was only some years later that they were examined and described in Elia 1939, where they were treated as Roman on the assumption that they came from the urn.

Subsequently, Fuhrmann 1941 drew attention to similar pieces in glass in the Cairo Museum. These had previously been dated in Lamm 1930 to around the tenth century AD. According to Fuhrmann 1941, they were made using an art and technique which are pre-Islamic and of which there are no examples dating from later than the first centuries of the Roman empire. The basis for this assertion, however, is unstated and unclear, and according to Allan 1995 the marvered glass used for these chessmen was used in Egypt and Syria from about the twelfth century to the fourteenth or fifteenth centuries.

Controversy over the Venafrò pieces continued over half a century, until the museum authorities in Naples were persuaded to have them carbon-dated. This was carried out in laboratories in Naples and Sydney, using the accelerator mass spectrometry method on a fragment of about 1 gram taken from one of the major pieces, and the results were reported with a history of the pieces in *Gli Scacchi di Venafrò 1994*.

The results of the two tests, which correlated closely with each other, were that there was a 68% probability that the pieces were from the period AD 885–1017, with a 95% probability that were from one of the periods AD 781–1044, AD 1104–1112 and AD 1147–1152. It is not clear from the report why the two later periods totalling thirteen years are included when the intervening periods of AD 1045–1103 and 1113–1146 are omitted.

It follows that the Venafrò and Egyptian pieces are completely irrelevant to questions relating to the origins of chess, and there is also no evidence to justify the early date that has been claimed for the San Sebastiano pieces.³⁹

More recently, in 2002, there were newspaper and internet reports of a supposed ivory chess piece said to have been excavated in Butrint in Albania and to have been dated to AD 465. Quite apart from the impossibility of dating the object so precisely, the piece bore no resemblance to any known early chess piece from any part of the world and was not associated with any other object said to be related to the game of chess. No reason has been given for the assertion

that this was a chess piece and I could see no reason to suppose that it was even if its date were 500 years later than that attributed to it. For a more detailed critique to a similar effect, see Thomsen 2002.

Where did chess begin?

Five arguments have been adduced in favour of an Indian origin for chess:

- 1 That there are very early references to chess in Indian literature, antedating references in other languages;
- 2 That the pieces in the original game of chess were based on the forces of the Indian army;
- 3 That Persian literature in particular recognises that chess reached Persia from India;
- 4 That the name of the game in other countries is etymologically derived from the Indian name *chaturanga*, and
- 5 That the names and concepts of the game in India are purely Indian and have no foreign element.

1 Earliest references

The earliest reference to *chaturanga* in Indian literature is in the *Harshacharita*, about AD 625–45. The equally brief mention in the *Karnamak* and the more extensive description in the *Chatrang-namak* may be a little earlier, but could equally well be significantly later. The first two of these presuppose that chess was well enough known to bear allusion without explanation. One cannot conclude anything from the dates of these references as to whether chess began in India or Persia, but the *Chatrang-namak*, as we have seen, asserts an Indian origin. The earlier the text is dated, the closer it comes to being contemporaneous with the events it purports to depict and the more likely it becomes that the story is based on real events.

The earliest known Chinese reference postdates the *Harshacharita*, (see Banaschak 2001). While this does not rule out a much earlier Chinese origin, there is no evidence of such an origin.

2 The elements of the Indian army

It is clear that the pieces in Indian chess do represent the traditional elements of an Indian army. The crucial piece here is the chariot, which did feature in Indian armies but which, according to Bland 1851 and Khavari 1998, did not form any part of Persian armies. It is noteworthy that the chariot does not feature among Persian chess pieces, where the equivalent piece is the *rukḥ*. It seems wholly unclear even to Persian scholars what the *rukḥ* originally was. Explanations have been put forward which, if correct, indicate that the piece has nothing to do with an army. Khavari 1998 has also suggested that it might refer to a tower on wheels containing troops, although if so it is surprising that this did not occur to anybody before. It is also to be remarked that even in the *Chatrang-namak*, where descriptions are included of all the other pieces, no description is given of the appearance of the *rukḥ*. The fact that the word *rukḥ* appears to have no connection with an army game suggests that it could not have been the original

38 See Elia 1939; Fuhrmann 1941; Chicco 1974 and Chicco 1978.

39 For a similar view see Kluge-Pinsker 1991: 41.

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word for the piece. The identity of the pieces therefore favours an Indian origin rather than a Persian one.

3 Persian traditions

The argument that Persian tradition has chess arriving in Persia from India is perhaps of only marginal significance, given that there are so many myths as to where chess began. Nevertheless, the tradition does exist, and can be dated back at least to the *Chatrang-namak*, and, as we have seen, the suggestion by Yekta'i 1970 and Calvo 1998 that the tradition does not refer to India does not bear close examination. There does not seem to be any Persian tradition that chess originated in Persia, which suggests that it did not begin there.

4 Etymology

Etymological considerations also support an Indian origin. *Chaturanga* means army. By contrast, neither Yekta'i 1970 nor Khavari 1998 suggest that *chatrang* in Pahlavi had such a meaning, although they emphasise that the word came from the same root as *chaturanga*, and meant four-sided, or square. The alternative, put forward by Calvo 1998a and 1998b, is to return to the suggestion made in Hyde 1694 that *chatrang*, used as the name for chess, is the same word as that for the mandrake plant. While Hyde, who argued in favour of an Indian origin for chess, plainly adopted that suggestion, he did so in ignorance of Sanskrit, and of the word *chaturanga* in that language. Neither Pahlavi meaning has any close connection with the game, whereas *chaturanga*, the army game, plainly does, and to my mind remains by far the more likely candidate for the source of the Persian word for chess.

In the contest between India and Persia as the original home of chess, therefore, one is left with the choice between an army game with pieces (all of which are associated with Indian armies) and a square or four-sided game, or a game called after a mandrake root, where one of the pieces, the *rukḥ*, appears to have no military significance.

5 Indian names and concepts in the earliest Indian texts

The final argument in favour of an Indian origin is that, as we have seen, the names of the pieces and the associated concepts in the earliest known Indian texts are purely Indian. Although not conclusive, the total absence of any apparent outside influence contrasts with the position in Persia, and suggests that there was no such influence when the game developed in India.

Other contenders

There is no serious evidence that chess began outside the area between north-west India and Persia. Nowhere west of Persia can be regarded as having a strong case, in that the Arabs adopted the Persian name for chess – *chatrang* became *shatranj* – and the Persian *rukḥ* was also adopted by them. I am aware of no Arab tradition that chess was of Arab origin. On the contrary, there is a strong Arab tradition that it began in India. Arab tradition is thus the same as the Persian one.

In Irwin 1793, Eyles Irwin reported that he had been told by a Chinese scholar, Pan Zhen-guan, that chess was invented by a Chinese general, Han Xin, in 203 BC. Li 1998 adopts this

bare assertion as the truth, although, as Banaschak 1998 points out, nobody has yet succeeded in identifying the source of Pan Zhen-guan's information. Li 1998 produces no shred of evidence to support this claim, or to justify preferring this story to any other about the invention of chess, including other conflicting Chinese stories on the subject. The remainder of Li 1998 is in part an irrational diatribe against almost all writers who have ever expressed a view on the origin of chess, and in part a work of fiction in which the author purports to give an account of the workings of the mind of Han Xin when he 'invented' the game. This is followed by an account of why there is no reference to chess in Chinese literature for 1000 years after Han Xin.

There is no evidence that chess was ever played in China except in the form of *xianqi*. In the form in which it has existed in recent centuries, this is a version of chess played on an 8 × 8 board, but with many differences from the Indian and Persian boards. In particular:

- 1 The pieces are placed not on the squares, but on the intersections of the lines.
- 2 There is a river running across the middle of the board.
- 3 The general (king) and his two ministers are confined to nine points and the elephants cannot cross the river.
- 4 There are additional pieces called cannons or catapults.
- 5 There are only five pawns.

The first reference to this game dates only from the end of the eighth century AD.⁴⁰ This is in the work referred to in Murray 1913 as the *Hüan Kwai Lu*, 'Book of Marvels', and in Banaschak 1998 as the *Xuanguai lu*, 'Tales of the Obscure and Peculiar,' written by the Tang Minister of State Niu Sengru (AD 779–847). In this work the pieces are identified as generals, horses, commanders, baggage-wagons, cannons and six pawns. It is unclear from the passage in question whether at that stage the pieces moved on the squares or the lines, whether elephants played any part, or whether there was yet a river across the middle of the board. It is plain, however, that even at that early stage the Chinese version of chess differed from the Persian game in the use of only six pawns, in the use of cannons, and in the names of general (instead of *shah*), and baggage-wagons (instead of *rukḥ*).

The name for chess in Tibet, *chanderaki*, and the Tibetan rules clearly derive from the Indian name and rules, and not the Chinese ones, indicating that the game reached Tibet from India, not China.

The 'baggage-wagons' are referred to as chariots in other early Chinese texts.⁴¹ This terminology also indicates that the game reached China from India rather than Persia. The fact that these pieces sit at the corners of the board, like those everywhere outside India, and have the same moves as the Persian and Burmese equivalents, also indicates that when the game spread out in different directions, the position and moves of the chariot were clearly established before they spread, whatever they may have been elsewhere in India.

The suggestion in Needham 1962 that *chaturanga* derived from ritual divinatory games is unsupported by any evidence of divinatory influence on the development of chess. Attempts by Bidev to demonstrate such influences fail, as discussed below. Indeed, although Needham plainly

⁴⁰ Murray 1913: 123–4.

⁴¹ Quoted in Murray 1913: 124.

addressed the possibility that chess might have originated in China, he had no evidence to support the idea, stating that ‘there is no need to commit ourselves to any definite conclusion as to when and where the “militarisation” of astrological image-chess took place; it may well have been in India in the following century.’⁴²

There is, therefore, nothing to connect Chinese divinatory games with chess, and no reason, if one rejects Culin’s theories (such as those of Culin 1898) that all board games have a divinatory origin, to suppose that chess had such an origin.

A phylogenetic approach to the origins of chess in Kraaijeveld 2000 also suggests that *chaturanga* is more likely to have been the origin of chess than *xianqi*.

The arguments against an Indian origin

It remains to consider the arguments against an Indian origin for chess, insofar as they have not been dealt with above. These are:

- 1 That the etymological arguments based on the word *chaturanga* are dubious, since *chaturanga* refers in India to a four-handed dice game, and not to the two-handed game of skill;
- 2 That the paucity of early references to chess in India and the absence of early Indian chessmen compared to the references and pieces found in and around Persia suggest that chess (as opposed to *chaturanga*) was only brought to India later.

1 The game referred to in India by the word *chaturanga*

In later times, *chaturanga* was generally used to denote four-handed dice chess variants in India, the two-sided game being called *buddhibala*, or sometimes *buddhiyuta*, denoting a game of the intellect. Calvo 1998a argues that this fact shows, or suggests, that *chaturanga* was always a four-handed dice game. Calvo combines this with the contention that two-handed chess was brought to India by the Arabs in about AD 1100, and that the terminology for two-handed chess was Persian and not Indian.

This claim seems to be misconceived for the following reasons:

- a *Chaturanga* is clearly used with reference to the two-handed game, in the passage from the *Nitivakyamurta* cited at the beginning of Syed 1998a, which refers to the relationship between the king and his minister in *chaturanga*. The minister was not a piece for which there was space in any known four-handed game. So too the *Caturangastaka* of Melputter Narayana Bhattathiri, examined in Rajendran 2001: 24–5, clearly refers to the two-handed game, while in the *Manasollasa*, as Bock-Raming points out, the title of the section on the two-handed game is *Chaturangavinoda*.
- b In the above-mentioned texts, in the *Balakahitabuddhibalakridanam*, and in many other works referred to in Murray 1913 and Rajendran 2001, which deal with two-handed chess from the fourteenth century to the present day, the terminology is purely Indian. As Bock-Raming

1994 has clarified: ‘the *Manasollasa* does not show the slightest evidence that words or expressions from the Arabic language have crept in as is the case with later Indian texts on chess. On the contrary, considering the terminology of the *Manasollasa*, it more than once reveals a specific context of its description of chess: that of the Indian army. The arrangement of the pieces is repeatedly called *vyuha* which in Indian texts dealing with the conduct of war means “battle array”. Even the names of specific arrangements of the chess pieces like the ... *Gomutra* are names of battle arrays and have their place in the Sanskrit texts on the conduct of war.’

- c The name of the two-handed game in adjacent countries derives in different ways from *chaturanga*. Thus, in Burma, for example, the name is *sittuyin*, derived from the word *sit*, or ‘army’, being the same word as for the commander of the army. The Khmer name, in contrast, is *chhoeu trang*.⁴³ These are two-handed games, as is *chanderaki* in Tibet.⁴⁴ The Calvo theory would require that these countries adopted the name of the four-handed game, not the two-handed game, as the name of their own two-handed game.

- d The evidence, considered below, shows that the four-handed game in India was a variation of the two-handed game.

- e It is clear that al-Adli and al-Masudi understood that the game played in India in their time and earlier was a two-handed game. The attempt by Yekta’i 1970 and Calvo 1998a to suggest that these writers were not referring to India is plainly wrong for the reasons already given.

If Calvo were correct that the four-handed game did precede the two-handed one in India, one would still have to ask where this game came from, and what was its relationship to the two-handed game of skill. If the four-handed version did come first, chess would still have begun in India, but would have spread as a two-handed game elsewhere.

It is also difficult to see the link between this argument of Calvo 1998a and b and the further argument as to the paucity of chess pieces, or textual references of the period, since if the four-handed game or any other version of *chaturanga* was played on the *ashtapada*, pieces would be required which would have been as likely to survive as those for the two-handed game.

What, in fact, seems to have happened is that at some stage there was a change in the name of the two-handed game to distinguish it as a game of the intellect from the four-handed game of chance played with dice.

2 The paucity of early references to chess in India and the absence of early Indian chessmen compared with early references and pieces found in and around Persia

Calvo 1998a and b comment on the fact that there are few Indian references to the existence of *chaturanga* in the early centuries, whereas, as he put it in Calvo 1998b: ‘pre-Islamic documents have solidly connected chess with the last period of the Sassanid rulers in Persia (VI–VII century).’ He also

42 Needham 1962: 324–5.

43 Murray 1913: 109; 117.

44 Murray 1913: 368–9.

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contrasts the survival of carved chessmen from the seventh to tenth centuries in Persian domains with the absence of comparable items in India.

It is a fair comment that there seem to be few references to *chaturanga* in surviving pre-twelfth century Indian texts. As we have seen, however, there are only two references in Persian texts of the same period, the allusive reference in the *Karnamak*, which might have been a late interpolation, and the account in the *Chatrang-namak*, which refers to India as the source of the game and which was repeated with variations over the centuries. However, the earlier Indian textual references which have survived clearly presuppose a knowledge of *chaturanga*.

There is also some evidence for old Indian texts on chess which have not survived. Al-Adli, in the middle of the ninth century AD, appears to have been familiar with the rules of chess in India,⁴⁵ while al-Masudi wrote, in the middle of the tenth century, that: 'the Indians, and others, the Greeks, Persians, and Byzantines who play at chess have given accounts of the manner and fashion of the pieces in chess, its arrangements, its beginnings, the various motives underlying it, its peculiarities, and the classification of the *qawa'im* and *mufridat*, and the classes of the noteworthy *mansubat*.'⁴⁶

The only surviving technical chess literature in the period up to AD 1000 is in Arabic. There can be no doubt that chess was popular in the Arab countries, and that its theory was both examined and written about, particularly in Baghdad, in a way that does not seem to have occurred either in Persia or in India. The fact that something developed in a particular country does not mean that it was invented there two hundred years earlier. The uses of gunpowder were developed in Europe although it was discovered in China, while the new chess invented in Spain in the late fifteenth century, with modern moves for the queen and bishop, was little written about in Spain. Of the books which are known to have existed, only two survive, one, by Lucena, being so rare that it was unknown to historians until the second half of the nineteenth century; neither greatly advances chess theory. The development of the new theory was left until the eighteenth century in Italy and France, at a time when chess seems to have been moribund in Spain.

It is true that no Indian chess pieces have been identified as dating from the years up to AD 1100, when the Muslim invasions began, but neither have they been identified from the period from AD 1100 to 1500. The earliest surviving Indian chess pieces of which I am aware date from as late as the middle of the sixteenth century,⁴⁷ although Indian literature from the twelfth century onwards and descriptions of life in India make it plain that chess was widely played by that time at least. So, too, there are few if any identifiable Spanish chess pieces which have survived from the much more recent period from the fifteenth to nineteenth centuries.⁴⁸

⁴⁵ Murray 1913: 57.

⁴⁶ Murray 1913: 164.

⁴⁷ See Mark 1997.

⁴⁸ Apart from one nineteenth-century playing set, the only pieces in books on old chessmen which are sometimes said to be Spanish are the so-called 'pulpit' sets. These are invariably found in Great Britain, can be seen from their design to have been made for the

I am not aware of any gaming pieces, with the possible exception of a few dice, which are known to have survived in India from the period in question, but nobody would suggest that there were no such pieces, or that games in general were not popular. Other possible explanations include the failure to identify such pieces or to date them accurately, the failure to excavate many sites of the period, or the failure of the game to become popular, with the result that there were few pieces to survive.

It is also worth noting that al-Masudi specifically states in the tenth century AD that in India ivory was mainly used for the carving of chess and *nard* (backgammon) pieces. Even if his report is treated as exaggerated gossip, this shows that chess was understood by him and his informants to be popular in India.

The absence of surviving Indian chessmen from the early centuries of chess is certainly a matter for comment, and there are many possible explanations. However, one can scarcely argue that pieces never actually existed, and conclude in the face of the other evidence to which I have referred that chess could not, or is not likely to, have come from India. On the contrary, the other evidence is sufficiently strong to make it more than likely that chess did originate in the north-west of the Indian sub-continent, and there must be another reason for the absence of surviving early Indian pieces.

When and how did chess begin?

Murray 1936 refers to three factors indicating that the game began in India about AD 570:⁴⁹

- 1 The absence of any earlier reference to the game in Indian literature. But, as we have seen, there is only one brief surviving reference to *chaturanga* in the *Harshacharita* before the middle of the ninth century, and Murray does not identify any surviving work where one would expect to see a reference to *chaturanga* if it existed.
- 2 The Persian story of the introduction of chess tells how an Indian ambassador brought the game to Khusru I and challenged him to explain the game or pay tribute. Murray points out that if such an event took place it is more likely that a new game would be used for this purpose than an older one which might already be known in Persia. But it is placing too great a weight on this legend to use it to support an argument that chess was then new in India.
- 3 For the century between AD 450 and 550 northern India was devastated by successive waves of Hun invasions which 'shook Indian society in northern India to its foundations and severed the chain of tradition', as Murray put it. It is true that the Hun invasions from about AD 450 contributed substantially to the decline and fall of the Gupta Empire in northern India, but it is not clear in what way Murray considered the chain of tradition to have

British market, and have no apparent connection with Spain.

⁴⁹ In Murray 1963, written in 1917 but only published after his death, he says that the evidence leads to the conclusion that the game was a conscious and deliberate invention of an inhabitant of north-west India not earlier than the Huri [presumably a misprint for Hun] domination which lasted from AD 455 to 543.

been severed. Further, the paucity of records of the period is such that it can be no surprise that there is no reference to *chaturanga*, and if there were any severing of the chain of tradition, it could explain why it is no longer possible to find any evidence of the game before the time of Harsha.

None of the factors relied on by Murray, therefore, is of more than marginal relevance to our search.

Since Murray's time, various arguments have been advanced in support of the proposition that some form of chess must have been known earlier than the sixth century AD.⁵⁰

Görschen 1980 contends that *chaturanga* must have emerged in a period of political and artistic flowering, and that the most likely place and period would have been at the court of Kamaragupta (AD 414–455). Kamaragupta was the fourth in the line of Gupta rulers who controlled or exacted tribute from the rulers of most of the Indian sub-continent. It may be that his court was a place at which *chaturanga* could have evolved, but there is no evidence to suggest that it did.

I have already considered in relation to Persian literature the points made in Brunner 1978, which suggested that the story of the origin of chess in the *Chatrang-namak* might date back to the sixth century.

Ferlito and Sanvito 1990 suggest that a form of proto-chess is likely to have evolved in the period between 400 BC and AD 400, when the chariot played a more important part in the Indian army than at any later period. It is certainly likely that chariots would first have been used in a war game at a time when they were still in use in the army, but their use did not cease by AD 400. They continued to be used as conveyances for officers. The game, if it was already a game, would have been played by members of the officer class, and it can therefore be no cause for surprise if chariots were introduced as the most powerful pieces on the board, even if on the battlefield they were of little value.⁵¹ There are also variations of the Indian game in which the chariot is given the weak diagonal move normally associated with the elephant and the elephant is given the orthogonal move normally associated with the chariot. If in the original version the chariot was the weakest piece on the board, this would suggest that the game began at a time when the chariot was not important.

Raymond Keene, in a paper elsewhere in this volume, suggests that chess could not have achieved the level of sophisticated analysis which was produced in Baghdad in the ninth century had it only been in existence since about the beginning of the seventh century. I see no reason why the type of end game analysis to which he refers could not have developed in the atmosphere of the Baghdad court without any substantial earlier development or analysis. An enthusiastic group of players, such as were to be found in ninth-century Baghdad, could easily have worked out the

more basic ideas which would then have been developed in a very short space of time.

This point is illustrated by the development of the modern game with its powerful queen and bishop. This game emerged in Spain late in the fifteenth century and spread to the rest of Europe over the following century. Yet in the 1740s Philidor evolved a consistent theory of play which he published in 1749 at the age of 23. His *L'Analyse des Échecs* was a major step forward in the game of chess with which nothing written earlier could compare. It coincided with a parallel development of theory among a small school of players in Modena in Italy.

I have already referred to the argument in Syed 1995 and 1998b that one would expect to find *chaturanga* references in certain Indian texts, and that the absence of such references makes it improbable that chess was invented before the fifth century AD. On the basis of limited information, however, it could have emerged at any time in the following two hundred years.

Which came first: two-handed or four-handed chess?

This question only arises if India were the place where chess began. Elsewhere, it is generally recognised that all very early references are to the two-handed variety, and that four-handed games which appear later are variants. A number of historians have argued, however, that in India four-handed chess came first. These arguments seem to be based on several misapprehensions: that *chaturanga* could be seen from its very name to be a four-handed game, that al-Beruni shows it to be a four-handed game, and that the two-handed game was always known in India as *buddhibala* or some similar name.

Averbakh 1991 argues by reference to the relief on the stupa of Bharhut, and to dice games in India, that there is good reason for supposing the four-handed game to have preceded the two-handed game in India, although it was the latter which spread to other parts of the world. This argument is in part based on the unproven assumption that the game depicted at Bharhut is a four-handed game, rather than a game for two with spectators, and upon the further unproven assumption that the game was, in some unexplained way, a forerunner of chess. The stupa scene shows four persons, two on each side of a game board, which has been split in two by some cataclysm. It plainly depicts a story which would have been well known in the Buddhist community of the time, but unfortunately remains unidentified by modern scholars. At present the carving tells us nothing of the history of chess; see now M. Soar, elsewhere in this volume.

Averbakh also considers the information about the four-handed dice chess game given by al-Beruni in the eleventh century.⁵² In particular he examines the passage in which al-Beruni writes that:

chariots in use was increased by Harsha, along with other elements of the army. According to Sarkar 1984, as quoted in Syed 1998a: 73 n. 6, chariots fell into disuse in the seventh century and disappeared in the eighth century. Bhatta 2001 confirms that there is no evidence that Harsha reintroduced chariots.

⁵² As quoted at Murray 1913: 57–8.

⁵⁰ For a review of various works, not all of which are covered in this paper, see Pratesi 1990.

⁵¹ According to Bidev 1987: 216, relying on R. Singh, a historian who is not referred to in Ferlito/Sanvito 1990, the chariot fell out of use about AD 300 and was reintroduced as a conveyance for officers by Harsha. However, other historians indicate that the chariot did continue in use in that period, although the number of

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The pieces have certain values according to which the player gets his share of the stakes: for the pieces are taken and pass into the hands of the player. The value of the King is 5, that of the Elephant 4, of the Horse 3, of the Rook 2, and of the Pawn 1. He who takes a King gets 5, for two Kings he gets 10, for three Kings he gets 15, if the winner is no longer in possession of his own King. But if he has still his own King, and takes all three Kings, he gets 54 – a number which represents a progression based on general consent, and not on an algebraic principle.

Averbakh 1991 explains that the awarding of 54 points has been misunderstood by al-Beruni. By winning all three other kings while keeping his own, the winner gains the total value of all his opponents' pieces. Each player has one king, one elephant, one horse, one rook and 4 pawns, making a total of 18 points: $3 \times 18 = 54$. Averbakh says that this proves that, to win a four-handed game outright, the winner had to retain his king and capture those of his opponents. In fact, on the basis of these rules, he would also seem to win even if he lost his king, provided he had more points overall than his opponents, but it is clear that once he won the three kings without losing his own the game would be over, whatever had happened to his army in the process and whatever his opponents might be left with.

Averbakh argues that this is the origin of the concept of checkmate in the two-handed game. However, it is equally feasible that the idea that the winner must capture all the kings without losing his own is itself derived from the concept of checkmate in the two-handed game. Both derive from the concept that the war is won by capturing the opposition's ruler or rulers without losing one's own. In any event, it cannot be assumed that, because this point scoring system existed in the eleventh century in the form described by al-Beruni, it must have, or was even likely to have, existed before the two-handed version of the game came into being.

In fact, even assuming an Indian origin for chess, there is no reason to suppose that four-handed chess came first. As Eales 1985 has pointed out, the spread of the two-handed game of skill, and the absence of any suggestion by an Indian writer that four-handed chess was anything but a variant, suggests that the two-handed game of skill was the earlier. The presence of a minister in the *Nitivakyamurta* indicates that the game there was two-handed. None of the other references to *chaturanga* in Indian literature before the eleventh century enables us to discern the numbers of players, or whether dice were used.

The game was clearly one of skill as played in Persia, and there is no suggestion by al-Adli, when explaining the differences between the Indian and Persian games, that in this respect there had been a change from the game as played in India. Al-Masudi also understood Indian chess to be two-handed when he referred to Indian accounts of chess.⁵³ Nor is there any evidence of any Indian four-handed game spreading beyond India, although, according to Murray, other four-handed games did travel from India to China and Persia.

The earliest surviving descriptions identify the four-handed game as a variant. As Murray pointed out,⁵⁴ the

⁵³ Murray 1913: 164.

⁵⁴ *Murray Papers*, vol. 166: 237–48.

⁵⁵ Note here that the Indian 'Chaturanga set' purchased by Edward Falkener in London and illustrated by him in Falkener 1892: 119,

earliest, in al-Beruni, is as late as about AD 1000, and was preceded by at least four recorded Muslim variations of two-handed chess. Al-Beruni makes it clear that the pieces from a two-handed set were being used. He writes specifically that, in the four-handed game, 'the name of the Shah here applies to the Firzan'; in other words, the *firzan* from a set is being used as a *shah* in the four-handed game. Also, the accompanying diagram in the manuscript seen by Murray showed that only two colours were used for the four sides. Indeed, as Murray also pointed out, the first reference to four colours being used in the four-handed game was in a fourteenth-century Bengali work, the *Titthitattva*, while in all other works, and in the four-handed chess played in India around 1900,⁵⁵ the pieces used come from the two-handed game. Bock-Raming 1993 also draws attention to a four-handed version in the *Manasollasa*, with which Murray was unfamiliar, where the colours of the pieces are only red and white, suggesting again that the pieces from a two-handed game would be used.

Further, as Syed 1993, 1995 and 1998a and b point out, *chaturanga* was an army game. Armies normally operate with two sides fighting each other, not with four sides all competing against each other. Yet the four-handed variant apparently encountered by al-Beruni did have four sides competing against each other, as is clear from the fact that one king might capture all three other kings.

The phylogenetic approach adopted in Kraaijefeld 2000 also suggests that the 4-sided dice game was an experiment of a much later date than the 2-sided game.

Did chess evolve or was it invented?

This question, and the allied question of how it took place, have been the subject of a number of largely speculative theories. The possibilities are essentially four:

- 1 That it evolved from one or more racing, hunting or war games;
- 2 That it was created from scratch as a war game representing the forces of the Indian army, possibly inspired by army training exercises using miniature units on a grid;
- 3 That it derived from mathematical exercises on an 8×8 board; and
- 4 That it derived from divination techniques or rituals.

1 Evolution from another game or games

Several such theories have been put forward linking chess with one or more other games. These have included the suggestion that it derived from draughts, a theory which suffers from the serious problem that there is no evidence for draughts before about the thirteenth century, when it seems to have developed in Europe. There is no evidence of any link with any other game.

Some arguments have been put forward based on the supposed derivation of chess from earlier Indian games. Thus, Averbakh 1990 and 1991 (and this volume) seeks to

has been shown on examination by Irving Finkel and myself to be an amalgam of two, rather poor quality, conventional Bengali chess sets.

link the game with the chariot races of the Kshatriya aristocratic warrior caste, and with Greek influence leading to the concept of free will in the movement of the pieces, rather than leaving the matter to destiny in the shape of dice.

Averbakh points out that for two thousand years or more dice games had been a veritable passion with Indians. He suggests that chess might have derived from a dice race game played on a 5×5 square board. This could have turned into a race game played with chariots rather than unnamed playing pieces, and a rule could have emerged that if a piece landed on a square occupied by an opposing piece, the latter was permanently removed from the board rather than returning to the start of the race. This war game between chariots, he suggests, was then succeeded by a war game which reproduced the whole Indian army, the whole *chaturanga*, on the board.

It is possible that the war game between complete armies could have been preceded by a war game involving only chariots, but, as with so many of the other aspects of the early history of chess, there is no evidence of this or of any development from dice games.

Averbakh 1991 further argues that the concept of *karma*, or fate, in Indian philosophy was reproduced in games by the use of dice. Free will was a concept which reached India from Greece, and, in relation to games, may also have involved the impact of Greek war games such as *petteia*, following Alexander's expedition to India (327–325 BC). It was this new influence, he argues, which led to the playing of *chaturanga* without dice.

Unfortunately for this theory, there are no known rules for *petteia*, and it is not even clear that it was a separate game rather than an expression connoting any game with an element of skill (but still possibly played with dice), as opposed to games of pure chance. External influences which made Indians more receptive to concepts such as free will and to games with an element of skill could have made it possible for *chaturanga* to develop, but not in the way suggested by Averbakh, for the available evidence clearly indicates that the four-handed game of chance was adapted from two-handed *chaturanga* for those requiring a less intellectual game.

Maisellis⁵⁶ is even more specific, arguing that chess derived from *chaupur*, the traditional Indian race game played with dice on a cruciform board. He links the different moves of the pieces with the different numbers on the dice, and suggests that *chaturanga* originated in north-west India between the second and fourth centuries AD, and penetrated southern Central Asia almost immediately. He also suggests that the change-over to an 8×8 board and a two-sided game took place in southern Central Asia. Quite apart from the evidence that chess was initially a two-handed game, there are additional problems with this theory. First, *chaupur* is normally played with four-sided long dice, and four equal-value pieces for each player; even in the four-handed game of chess there are five different types of pieces on each side. On the cruciform board, the pieces could not have begun to develop the moves they possessed in any version of the game

of which we are aware. Finally, there is neither evidence for this speculation nor reason for it, as there are simpler and more logical explanations for the emergence of chess.

Holländer 1994 rejects the suggestion that chess is likely to have evolved from a race game because in a race game he considered that there was neither strategy nor the chance to develop as it depended purely on the luck of the dice and all the pieces had the same powers. He considers that chess is more likely to have developed from a combination of hunting and strategic games. Such a development is plainly possible. The difficulty is that there is no evidence of any such games in which there were more than two types of piece or in which there were complex rules of the kind found in chess. While the inventors of *chaturanga* would have known of hunting and strategic games, and knowledge of these games could well have led to the concept of a new strategy game based on war, there is no evidence of any gradual progression from the one to the other.

Josten 2001 and 2002 seeks to put Holländer's thesis into more concrete terms, contending that *chaturanga* absorbed the idea of a relatively immobile central piece from Chinese games such as *weiqi* and *liubo*; that it absorbed the idea of pieces that could make generally unrestricted moves in various directions from Babylonian divination techniques; and that the concept of pieces that could only move forwards or sideways comes from Indian race games. He suggests that this resulted in a game of chess played on a circular board in the Near East, which later died out. He also suggests that it was adopted in India on an 8×8 board with the use of dice, producing four-handed chess, which he suggests was the first Indian type of chess – as I have already explained earlier in this paper, the available evidence contradicts this view. Thirdly, he suggests that in China *xianqi* developed in its own way from these various elements. He concludes that the amalgamation of the various elements occurred somewhere in Central Asia and suggests the Kushan empire between 50 BC and AD 200. A similar approach is adopted in Cazaux 2001, where it is argued that an eastern form of chess was developed from material in the Chinese game *liubo*, and that 'several elements were later borrowed by Persians or Indians to complete their own form of harmless battle game, from an existing substrate fertilised by a stable Hellenistic influence and Roman contacts'.

Unfortunately, this is all pure speculation. Josten imagines the creation of a game in Central Asia of which there is no evidence and for which there is no need in order to explain the invention of chess, while Cazaux also requires a pre-existing game of *xianqi* of which there is no evidence, and the transmission of the game from China westwards which is contradicted by such evidence as there is.

2 Chess created as a game of war

Murray 1913 concluded, in agreement with Sir William Jones 123 years before him:

- 1 That *chaturanga* was probably invented by a genius, who created on an existing game board a war game representing the forces of an Indian army;

⁵⁶ In *Schachmaty in SSSR*, 1952, nos 10 and 12, summarised and discussed in Chicco 1953.

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- 2 That he gave the pieces moves that suggested the actual moves of those forces; and
- 3 That he made the game depict a battle and made its termination show the capture of one of the kings or the destruction of his army.

In Murray 1936, the reasoning is that the invention of chess lay within the powers of a genius, and that there was no time for it to evolve in any other way if it did not exist much earlier than AD 570.

The second part of this reasoning cannot survive the defects in Murray's arguments in favour of AD 570, considered earlier in this paper, and was derided in Bidev 1987.

However, Murray explained his belief on this matter in his private correspondence.⁵⁷ Chess had a beginning, he wrote, because it was the expression of a new idea, to base a board game upon a battle. He regarded that new idea as so novel that earlier experience would have counted for little in representing the different forces and their tactics on the board. The invention may have come through experiment, but these experiments only became chess when the inventor presented his invention in (what was for him) its finished form to his fellows. The objective of the inventor was to make as convincing a depiction of a battle as possible.

This premise and this reasoning, that chess was the first game to represent a battle of armies and that one individual must have been the first to conceive the idea and to work it out, is a plausible basis for the claim that chess was the invention of a single person, even if, as Murray accepts, that claim can never be proved. It does, however, depend upon the at best unprovable premise that there was no previous war game which might have served as a model.

Similar arguments are advanced in Syed 1993, 1995 and 1998a and b. She argues that there is no evidential basis for trying to trace the evolution of *chaturanga* from some earlier board game, and that it derived from the use in India of didactic models and model battlefields to teach the art of warfare. It was a natural development, she suggests, that someone should experiment with the use of a formal board for such exercises according to fixed rules related to the shape and size of the board, and that the differentiation of the pieces should reflect their actual or assumed powers on the battlefield.

In Syed 2000b, Syed also pursues evidence for her theory. She refers to numerous terracotta figures of warriors, riders on horses, chariots and elephants dating from the sixth to the eighth centuries, which from their design and size could be chessmen, and examines and illustrates eight of them. She warns that there is no group which could be interpreted as a chess set, but points out that as the excavators and art historians had not thought of the figures as possible chessmen, it was conceivable that an incomplete set was not recognized as such. This is, perhaps, to place too much emphasis on evidence that might have been but which cannot now be shown to have existed.

The approach of Syed has been criticised in Meissenberg 2002 and 2003, while the whole theory has been criticised, most noticeably in Bidev 1987, on a number of grounds. In

particular, it has been pointed out that in real battles the infantry do not lead the attack, and that they are also able to retreat. Elephants in real battles would come into contact with each other, but cannot do so in chess. In general, it is said, it is not possible to explain either the arrangement of the pieces or their movements by reference to realistic warfare.

Much of this is true. One can identify moves that may bear some relation to movements on the battlefield, but there are many aspects of the game which are far removed from the reality of a battle. However, this theory does not require a close relationship between the game as we learn of it and the battlefield. The essence of this theory is that the game developed from battlefield manoeuvres with miniature pieces on a grid. In the course of this process, there would have been experimentation and adaptation to refine the initial ideas. The resulting game with fixed rules need not be a close imitation of the battlefield. A game in which the parties move by turn and in limited fixed steps is already removed from a real battle, and the object would have been to produce as good a war *game* as possible, even if this meant moving even further from the real battlefield.

While all theories of how chess evolved are speculative, this theory is presently the most plausible. The creators would certainly have known of other board games and these may well have included strategic and hunting games. It is even possible that they knew of games which originated outside India. Such knowledge would have assisted them in developing *chaturanga*. It would not, in my vocabulary, have made the earlier games forerunners of *chaturanga*.

3 Chess and mathematics

Various attempts have been made to link the origins of chess with the numerical properties possessed by the pieces and by the squares of the board. On the basis of these links, in particular, it has been asserted that the original chariot move was that stated by al-Adli, namely two squares orthogonally along the ranks and the files.

It has been pointed out by Camaratta 1994 that when the pieces are placed on the central square of a 5×5 board, between them they control every other square on the board, with no square controlled by more than one piece – assuming, of course, that the rook move is the same as the chariot move referred to in the previous paragraph. Camaratta suggests that this explains the otherwise rather odd knight move. The fact that no square is controlled by more than one piece is the necessary consequence of their all having different moves, and would not therefore seem to have any great significance. That between them they control all the squares may have some significance, but the same consequence would follow if, for example, on a 64 square board, the inventor, having used up all the other one and two square moves on the other pieces, needed an additional two square move for the cavalry. That would provide an explanation for the move related to the nature of the game and the number of pieces in it, whereas there is no apparent reason for choosing the knight move on the basis suggested by Camaratta.

⁵⁷ Letter dated 6 January 1936 from Murray to Paul Seyferth, in *Murray Papers*, vol. 166: 243–4. See also the earlier letter from

Murray to Seyferth dated 31 October 1935 and notes enclosed with that letter: *Murray Papers*, vol. 166: esp. at 225–7.

| | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 |
| 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
| 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 |
| 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 |
| 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 |
| 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 |
| 64 | 63 | 62 | 61 | 60 | 59 | 58 | 57 |

Fig. 18.1 The numbers in bold are rotated 180 degrees to produce the Safadi board in Fig. 18.2.

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 8 | 7 | 59 | 60 | 61 | 62 | 2 | 1 |
| 16 | 15 | 51 | 52 | 53 | 54 | 10 | 9 |
| 41 | 42 | 22 | 21 | 20 | 19 | 47 | 48 |
| 33 | 34 | 30 | 29 | 28 | 27 | 39 | 40 |
| 25 | 26 | 38 | 37 | 36 | 35 | 31 | 32 |
| 17 | 18 | 46 | 45 | 44 | 43 | 23 | 24 |
| 56 | 55 | 11 | 12 | 13 | 14 | 50 | 49 |
| 64 | 63 | 3 | 4 | 5 | 6 | 58 | 57 |

Fig. 18.2 The numbers in each row total 260, as do the numbers in each column and in each long diagonal, and many other sets of 8 numbers, as described in the text.

Calvo 1994a and 1994b seeks to link the origin of chess with magic squares. The earliest references to such squares that Calvo has been able to find date only from the tenth century. He argues, however, that such squares must have been known earlier, and that the relationships of the moves of the chess pieces to particular magic squares are too numerous to be coincidental. A magic square is one in which each of the sixty-four squares is given a number from 1 to 64 in such a way that the sum of all the numbers in any straight line of eight squares is 260. The square which Calvo 1994a and 1994b argues is the 'genetic code' of chess is one which appears in an Arabic manuscript, MS Berlin 7663-1, written by one al-Safadi, and which according to Wieber 1972, is the only magic square in the form of a chessboard present in Arabic manuscripts (see Figs 18.1 and 18.2).

On the Safadi board, not only is the sum of the squares on each vertical and horizontal line and each of the two long diagonals 260, but in addition each of the king, *mantrin* (counsellor) and horse, moving from its starting square to the other end of the board in a way which represents its supposed move, would land on squares totalling 260. So too, each of the elephants, supposing them to have the same moves as in Persia, would be able to land on eight squares in total, and in each case the sum of those squares would be 260. So far as chariots are concerned, a similar result follows for any eight consecutive chariot moves using the two-square move, or by taking the sum of the squares in the file and rank available to the chariot on the hypothesis as to the original move in Murray 1913 and Bidev 1986. Calvo 1994a and 1994b also points out that the elephant has access to eight squares, the jumping chariot to sixteen squares, the vizier to thirty-two squares and the kings and horses to all sixty-four squares.

Calvo uses the knight's tour and the account of how Sissa invented chess to support his theory. In a knight's tour, the knight visits every square on the board once, never landing on any square more than once. Calvo shows how the oldest known form of such a tour, if made on a Safadi board, produces a sum of 260 for every eight moves, and in most cases 130 for every four moves.

In the story of the invention of chess by Sissa, the Indian king asks Sissa to name his reward, and he asks for one grain of rice on the first square of the board, two grains on the second square, four grains on the third square, and continuing to the sixty-fourth square, doubling the grains on each successive square. This story is yet another example of mathematical calculations associated with the chessboard, and could be even older than the invention of chess.

Calvo 1994a and 1994b also relies on the Persian legend, as told in Firdausi's *Shahnama*, concerning the introduction of chess from India, which, as we have seen, recounts how a Persian counsellor was able to deduce the moves of the pieces. Calvo argues that for that to have been possible the game must have had its own inner logic. Even treating the legend as merely illustrating in a metaphorical sense the logical sequence of reasoning which led to the introduction of chess, he argues that the key must have been the Safadi board.

Calvo's arguments are interesting, but not flawless. They depend to some extent on the original moves of the pieces being what the proponents of the various theories suggest them to be. Also, the sum of the numbers using the magic square is a property of the board rather than of the pieces, while the differing multiples of eight squares available to the different pieces would be more impressive if there were not two pieces, the king and the horse, with control of all the squares.

Any attempt to differentiate the six types of piece by giving them different, but straightforward, moves, leads almost inevitably on the Safadi board to products for eight moves of 260, and there is nothing requiring additional explanation when the moves chosen for each piece are different moves of one or two squares, or a move which allows the whole board to be crossed along an orthogonal or diagonal line.

4 Chaturanga as a microcosm of the universe, a battle of the elements

Needham 1962 argues that *chaturanga* was derived from Chinese astrological games. He gives examples of such derivations in China which precede the earliest mention of chess. In particular he refers to an essay by Pan Ku (about the first century AD) on an unidentified game which he calls *chhi*. Pan Ku writes:

Northerners call *chhi* by the name of *I*. It has a deep significance. The board has to be square, for it signifies the earth, and its right angles signify uprightnes. The pieces are yellow and black: this difference signifies the Yin and the Yang – scattered in groups all over the board they represent the heavenly bodies.

These significances being manifest it is up to the players to make the moves and this is connected with kingship. Following what the rules permit both opponents are subject to them – this is the rigour of the Tao.

It is not clear from this quotation, however, whether this cosmic element was part of the game from its beginnings, or whether, as so frequently happened with games, it was

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superimposed by later philosophers seeking to find a deeper meaning in an existing game. From the history of other games, including chess and *nard*, the latter is more likely.

Nard is treated as a struggle for power between the forces of night and day in the passage in the *Chatrang-namak* to which I referred earlier.⁵⁸ A similar treatment was given to chess by al-Masudi, writing about 950, when he refers to the invention of chess as involving an allegory of the celestial bodies, and to the chess board as becoming a school of government and defence and being consulted in time of war.⁵⁹ In the Middle Ages in Europe chess was given a moral symbolism, for example by Cessolis, which was wholly unconnected with its origins in India or in Persia. If the first we knew of chess was in the form described by Cessolis, it would be all too easy to suggest that it was a game invented in Europe to recreate a conflict between two medieval societies in the form of a board game. In fact, the original identity of the pieces had been changed in Europe to relate them to the structure of medieval European society.

Needham 1962 also refers to the invention of an image game, which he calls image chess, reputedly invented by the Emperor Wu, who wrote a manual for it in AD 569. A preface to the manual survives. The game used images of heaven, the sun, the moon and the stars, and also of the earthly elements: earth, air, fire, wood and metal. *Yin* and *yang*, peace and war, virtue and vice and other concepts also played their part. Needham describes the image game as 'nothing but a mimicry of the eternal contest between the two great forces in the universe, Yang and Yin'. Linder 1979 rightly criticises Needham for his deliberate use of the word chess to describe games and rituals which have no connection with chess.⁶⁰ But what Needham does show is that in China there was a clear and recognised connection between games and techniques of divination – between games and conceptions of the universe. He also shows how the astronomical game was invented in about AD 569 specifically as a divination technique, and how the pieces in the game and their moves were devised with that in mind.

Needham 1962 leaves open the question whether the hypothetical original astrological game was turned into the war game *chaturanga* in China or in India. He also makes no attempt to identify any astrological elements in *chaturanga* itself. That attempt was made in Bidev 1986 GS and ES, which argues that *chaturanga*, if not an invention of a single genius as Murray 1936 suggested, had Chinese roots and was the creation of a group whose aim was to recreate on a board symbolic of the earth the elemental struggle between the forces of light and darkness, and that it was created in north-west India either in the latter part of the sixth or in the early part of the seventh century.

Bidev 1986 claims to find in these games the inspiration for *chaturanga*, although his ideas as to *chaturanga* having a ritual origin were first published in the early 1950s, before any Chinese connection occurred to him.⁶¹ Bidev 1986 asserts that there is no explanation for the moves of the pieces which

can arise from the concept of a battle between two Indian armies.⁶² He considers the origin of *chaturanga* in the light of Culin's theory that games derive from occult ceremonies and magic processes and are based on certain fundamental conceptions of the universe. Proceeding from the premise that Indian gods like that which is wrapped in secrecy and only hinted at, he asserts that there is internal evidence in *chaturanga* of a second level of struggle, between the forces of light and darkness, which was hidden from all but initiates.

He argues that, as in China, the square board was a symbol for the earth, and that the chariots started from its four corners, together with their moves, which can make a square,⁶³ suggesting a relationship between the chariots and the earth. The horse was a symbol in India for water, as was the wavy line formed by its moves. The elephant was a symbol for air. Earth, water and air were three of the five elements in Indian science. The others were fire and ether. The name in Indian chess for the equivalent piece to the vizier in Persian chess was often the *mantrin*, which not only means the counsellor, but also the magician, the symbol for fire, while the king's moves could be made in a circle, which was the symbol for the fifth element, ether.

Bidev also seeks to explain the part played by the pawns in this concept of the game. In Indian science, he asserts, the elements were not pure but constituted of eight parts. Of those eight parts, four parts were that element and the other four parts represented each of the other four elements. Earth thus consisted of four chariots and four pawns, the chariots being earth, and the four pawns embryonic versions of each of the other elements. Water and air were similarly constituted. He accepts that ether and fire, represented by the king and the *mantrin*, do not exist in eight parts on the chessboard. He suggests that originally there were only four elements, as suggested by the name *chaturanga*, that there was no king, and that fire was represented by two *mantrins* and two pawns on each side.

Bidev argues that, in Indian philosophy, the universe is a game undertaken by a supreme deity and that three fundamental factors determine the life of material in the universe: light, movement and darkness. Light and darkness are represented by the two sides and the scenario is completed by the movement of the light and dark pieces. The material passes from rest to activity and light, darkness and motion begin the struggle for supremacy.

Unfortunately, Bidev fails to realise that the symbols for the elements on which he relies were typical only of Tantric literature, which orthodox Hindus have always treated as heretical. He also fails to appreciate that the theory of mixed elements developed too late to have had any possible influence on chess in the seventh century or earlier, achieving its final form only about AD 1500 in the *Vedantasara* of Sadananda.⁶⁴

There are also certain internal inconsistencies in the theory. Bidev 1986 discusses the problems with the

58 On page 143.

59 As quoted at Murray 1913: 210.

60 Linder 1979: 21.

61 'New Investigations about Chess Origin', in *Mail Chess*, Belgrade, December 1951, January 1952, reprinted as Bidev 1986 ES: part 5.

62 Bidev 1986 ES: 80.

63 Bidev 1986 ES: 67–70.

64 Written communication from Andreas Bock-Raming, 23 December 1993.

composition of fire and ether.⁶⁵ He fails to deal adequately with the fact that the natural term for a game with five elements would be *pancanga*, not *chaturanga*.

His attempt to exclude the king/ether is unsatisfactory and offers no explanation why that element should be omitted. It is also difficult to find in the elephant's moves the six-pointed star required by Bidev. Finally, his observations on light and darkness seem to assume that the pieces were light and dark in colour, rather than the most common Indian colours of green and red, which are also those given in the *Chatrang-namak*.

The dangers of an overheated imagination in seeking hidden meanings in the early game of chess or *chaturanga* are vividly illustrated in Levitt 1991, where at one point he explains the elephant in its 'bishop' role as a symbol of wisdom, and therefore of the Brahman, while the chariot is said to be a crafted item which could be used to carry goods, and therefore a symbol of the commercial classes. This symbolism, he claims, continued when the ship was substituted for the chariot, and even when the elephant was substituted for the chariot/ship – at this point the elephant's wisdom is passed over and it is described as a beast signifying wealth and goods.

There is no evidence that *chaturanga* had mystical origins, whether deriving from Chinese influence or not. The claims of Needham and Bidev are speculation, based on assumptions as to the origins of games in general, which are at best unproven and probably wrong, and for which there is no evidence in relation to *chaturanga*. Bidev's ingenious attempts to demonstrate such an origin by reference only to the supposed original rules of the game and the names of the pieces not only fail to stand up to close examination, but are unnecessary when there are far simpler and more convincing explanations available.

Conclusion

The evidence is sparse, but it points to chess having begun in India. It also clearly indicates that the two-handed game preceded the four-handed game. Chess clearly existed by the first half of the seventh century AD, and it is probable that it came into existence at some point between AD 400 and 600.

It is unclear how it originated. There is no evidence of any development from any earlier game. Despite the efforts of Needham 1962, Bidev 1986 and Levitt 1991 to prove the contrary, hidden analogies between the pieces or the game and anything other than a battle between armies, if they exist at all, are likely to have been superimposed on the game after it became popular.

At present, chess seems most likely to have evolved, as Murray 1936 and Syed 1993, 1995, 1998b and 2001 suggest, from military manoeuvres carried out as a game or exercise, on a miniature battlefield, following the idea of representing such a battle on a board of sixty-four squares. Such a representation might originally have been for a purpose other than the playing of a game. The use of the same board for

mathematical exercises and other purposes, as suggested in Calvo 1994a and 1994b, may have been relevant in the choice of board on which to conduct the battle, and of the moves allocated to the pieces.

There is no evidence as to how chess evolved before its appearance in Persia. It seems clear that over the centuries it was played according to several sets of rules in India. We do not know which was the first of these, but it seems likely that the moves of the elephant and the chariot which were adopted by all other countries to which chess spread were the moves in use in that part of India from which it spread.

It is impossible to come to any firmer conclusion on the available evidence. As Murray stated:

any attempt to penetrate Fiske's 'impenetrable darkness' can only be based on personal interpretations of the bearing of later facts, and the necessity of these interpretations must remain questionable. For other interpretations are always possible, and there is no criterion by which we can decide between them since the only valid test, that of contemporary trustworthy documentary evidence, is impossible.⁶⁶

Postscript – April 2005

This paper was completed in 2000. Unfortunately, while the wheels of the British Museum Press may grind exceeding small, they also grind exceeding slow. Much has been published in the intervening time, mostly in German. I have sought to update this paper in the course of checking the proofs, but the time available to me at this time and the space available at this stage of preparation for publication have meant that not all the publications of the last five years have had the space and attention they deserve. For this I apologise to the authors.

Bibliographical references

- Allan 1995:
J. Allan, 'Investigations into Marvered Glass: 1', in J. Allan (ed.), *Islamic Art in the Ashmolean Museum*. Oxford Studies in Islamic Art 1/X: 1–29.
- Averbakh 1990:
Y. Averbakh, 'To the question of the origin of chess', unpublished paper delivered at the Fourth Congress of Chess Collectors International, New York, May 1990.
- Averbakh 1991:
Y. Averbakh, 'Wie das Schachspiel Entstand', *Schach-Journal* 1: 51–64.
- Banaschak 1998:
P. Banaschak, 'A Story Well Told is not Necessarily True: A critical assessment of David H. Li's *The Genealogy of Chess*', *The Chess Collector* 7/2: 3–5.
- Banaschak 2001:
P. Banaschak, *Schachspiele in Ostasien (Xiangqi, Changgi, Shogi). Quellen zu ihrer Geschichte und Entwicklung bis 1640*. Munich.
- Bhatta 1994:
C. P. Bhatta, *Origin and Genesis of Chess*. Seevetal.
- Bhatta 2001:
C. P. Bhatta, 'The origin of chess in relation to war and peace as gleaned from Sanskrit literature', in *Working Papers "Indian Views", A Collection of Papers on Chess and other Board Games*, 15–18. Kelkheim/Ts.
- Bidev 1986 ES:
P. Bidev, *Stammt Schach aus Altindien oder China?* [English section]. Yu Igalo.

65 Bidev 1986 ES: 37.

66 Letter, 6 January 1936 from Murray to Paul Seyferth in *Murray Papers*, vol. 166: 243.

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- Bidev 1986 GS:
P. Bidev, *Stammt Schach aus Altindien oder China?* [German section]. Yu Igaló.
- Bidev 1987:
P. Bidev, 'How old is chess?', *British Chess Magazine*: 214–17.
- Bland 1851:
N. Bland, 'Persian chess', *Journal of the Royal Asiatic Society* 13: 1–70.
- Bock-Raming 1993:
A. Bock-Raming, 'Ein bisher unbeachtet gebliebener Sanskrit-Text zum Indischen Schachspiel', *Schach-Journal*, 1993/1: 71–7.
- Bock-Raming 1994:
A. Bock-Raming, 'The varieties of Indian chess through the ages', *The Chess Collector* 4/4: 17–21, 5/1, 8–13.
- Bock-Raming 1996:
A. Bock-Raming, 'Manasollasa 5, 560–623: Ein bisher unbeachtet gebliebener Text zum indischen Schachspiel, übersetzt, kommentiert und interpretiert', *Indo-Iranian Journal* 39/1 (Jan. 1996): 1–40.
- Brunner 1978:
C. J. Brunner, 'The Middle Persian explanation of chess and invention of backgammon', *The Journal of the Ancient Near Eastern Society of Columbia University* 10: 43–51.
- Burjakov 1994:
J. F. Burjakov, 'Zur Bestimmung und Datierung einiger der ältesten Schachfiguren', *Antike Welt. Zeitschrift für Archäologie und Kulturgeschichte* 25/1: 62–71.
- Calvo 1994a:
R. Calvo, 'Die Hypothese von Johannes Kohtz', *Homo Ludens. Der spielende Mensch* 4: 29–45.
- Calvo 1994b:
R. Calvo, 'Some flashes of lightning into the "impenetrable darkness" of chess origins', *The Chess Collector* 4/1: 14–28.
- Calvo 1998a:
R. Calvo, 'Wo das Schachspiel nicht herkommt', paper delivered at the Third Congress of Chess Collectors International, Vienna, May 1998.
- Calvo 1998b:
R. Calvo, 'Wo das Schachspiel nicht herkommt - Facts to think about', in M. A. J. Eder (ed.), *Arbeitspapiere zum Privatissimum "Seidenstrasse"*, Berlin 20–21, Februar 1998: 53–5. Kelkheim.
- Camaratta 1994:
F. Camaratta, 'The mysterious knight move', *CCI [Chess Collectors International]-USA News* 2/1, Jan. 1994: 10–12.
- Cazaux 2001:
J.-L. Cazaux, 'Is Chess a Hybrid Game', *Initiativgruppe Königstein VI. Symposium Amsterdam Max Euwe-Centrum November 30th to December 2nd 2001*: 9–13. Seevetal.
- Chakravarti 1938:
C. Chakravarti, 'Sanskrit works on the game of chess', *Indian Historical Quarterly* 14: 275–9.
- Chicco 1953:
A. Chicco, 'Luci nella preistoria degli scacchi', *La Scacchiera*, 1953: 93–7.
- Chicco 1974:
A. Chicco, 'Contributi dell'archeologia all piu antica storia degli scacchi', *Tutto Scacchi*, April 1974: 180–2.
- Chicco 1978:
A. Chicco, 'I primordi degli scacchi in Italia', *Eco Scaccho*, Oct. and Nov. 1978.
- Christensen 1944:
A. Christensen. *L'Iran sous les Sassanides*. Copenhagen.
- Contadini 1995:
A. Contadini, 'Islamic ivory chess pieces, draughtsmen and dice', in J. Allan (ed.), *Islamic Art in the Ashmolean Museum*. Oxford Studies in Islamic Art 1/X: 111–14.
- Culin 1898:
S. Culin, *Chess and Playing Cards*. Report of the U.S. National Museum for 1896: 665–942.
- Davidson 1949:
H. A. Davidson, *A Short History of Chess*. New York.
- Dwivedi 1976:
V. P. Dwivedi, *Indian Ivories*. Delhi.
- Eales 1985:
R. Eales, *Chess, The History of a Game*. London.
- Eder 1994a:
M. A. J. Eder, 'Der Vogel ist Kein "Turm"', *Schach-Journal* 1994/1: 41–4.
- Eder 1994b:
M. A. J. Eder, 'Die Schach figuren aus Afrasiab', *Antike Welt, Zeitschrift für Archäologie und Kulturgeschichte*, 25/1: 71–8.
- Elia 1939:
O. Elia, 'Un Gioco di Scacchi di Eta Romana', *Bolletino del Museo dell' Impero Romano* 10: 57–63.
- Falkener 1892:
E. Falkener, *Games Ancient and Oriental and How to Play Them*. London [repr. by Dover Books, 1961].
- Ferlito/Sanvito, 1990:
G. Ferlito and A. Sanvito, 'Protochess – 400 BC–400 AD', paper for the Fourth Congress of Chess Collectors International, New York, May 1990 [repr. in *Supplement to The Chess Collector* 5/2, July 1996].
- Finkel 1991:
I. L. Finkel, 'Babylonian chess? No!', *The Chess Collector* 2/3: 17–18.
- Fuhrmann 1941:
H. Fuhrmann, 'Spielsteine des lusus latruncolorum aus Venafro und Rom', *Archaeologischer Anzeiger*, 1941: cols. 616–29.
- Gadd 1939:
C. J. Gadd, 'Babylonian chess?', *Iraq* 7: 66–72.
- Görschen 1980:
F. C. Görschen, *Schach. Das Kriegsspiel aus dem Wunderlande Indien*. Winsen/Luhe.
- Gli Scacchi di Venafro 1994:
Gli Scacchi di Venafro Datazione Radiocarbonica con il Metodo della Spettrometria di Massa con Accellatore [Supplement 1064 of *L'Italia Scacchista*; various authors].
- Holländer 1994:
H. Holländer, 'Thesen zur Fruh-und Vorgeschichte des Schachspiels', in *Homo Ludens. Der Spielende Mensch*, 4: 17–28.
- Hyde 1694:
T. Hyde, *Mandragorias seu Historia Shahiludii*. Oxford.
- Irwin 1793:
E. Irwin, 'An account of the game of chess, as played by the Chinese', *Transactions of the Royal Irish Academy*, 1793: 53–63.
- Josten 2001:
G. Josten, *Chess – A Living Fossil*. Cologne.
- Josten 2002:
G. Josten, 'Chess – A living fossil (Abstract)', *Initiativgruppe Königstein VI. Symposium 2001 Amsterdam Max Euwe-Centrum vol. II: Die Frühgeschichte des Schachspiels*: 1–4. Seevetal.
- Khavari 1998:
M. A. Khavari, 'Schach im Iran - Einige Überlegungen zu den iranschen Schach-Episoden', in M. A. J. Eder (ed.), *Arbeitspapiere zum Privatissimum "Seidenstrasse"*, Berlin 20–21, Februar 1998: 28–41. Kelkheim.
- Kluge-Pinsker 1991:
A. Kluge-Pinsker, *Schachspiel und Trictrac*. Sigmaringen.
- Kohtz 1916:
J. Kohtz, 'Von der Erfindung des Schachspiels', in C. Schlechter (ed.), *Handbuch des Schachspiels von P.R. Bilguer*. 8th edn.: 17–61. Leipzig.
- Kraaijeveld 2000:
A. R. Kraaijeveld, 'Origin of chess – a phylogenetic perspective', *Board Game Studies*, 3: 39–50.
- Lamm 1930:
C. J. Lamm, *Mittelalterliche Gläser und Steinschnittarbeiten aus dem Nahen Osten* 1. Berlin.
- Levitt 1991:
S. H. Levitt, 'Chess – Its South Asian origin and meaning', *Annals of the Brandarkar Research Institute Poona*, 72–3: 533–47.
- Li 1998:
D. H. Li, *The Genealogy of Chess*. Bethesda, Md.
- Linder 1979:
I. M. Linder, *Chess in Old Russia*. Zurich.
- Linder 1992:
I. M. Linder, 'A comparative study of two chess pieces exhibited in the Bibliotheque Nationale Paris, and in the Hermitage, St. Petersburg', *The Chess Collector* 3/1: 13–16.

- van Lohuizen 1981:
J. E. van Lohuisen de Leeuw, 'A unique piece of ivory carving – the oldest known chessman', in *South Asian Archaeology 1981. Proceedings of the Sixth International Conference of the Association of South Asian Archaeologists in Western Europe. Held in Cambridge University 5-10 July 1981*: 245–9.
- Mark 1997:
M. Mark, *Antique Indian Chess Sets/Alte Indische Schach-Sets*. Kelkheim/Taunus.
- Mark 2002:
M. Mark, 'But it probably does come from India', *Initiativgruppe Königstein VI. Symposium 2001 Amsterdam Max Euwe-Centrum, II/III*: 15–20. Seevetal.
- Meissenburg 1976:
E. Meissenburg, *Das Schachspiel in der mittel-persischen Literatur*. Winsen/Luhe.
- Meissenburg 2002:
E. Meissenburg: 'Warum sollten alle persischen Quellen die Unwahrheit sprechen?', *Okkasioneller Rundbriefen* 20. Seevetal.
- Meissenberg 2003:
E. Meissenburg, Review of Syed 2001 in *Board Game Studies*, 6: 104–118. Leiden.
- Murray 1913:
H. J. R. Murray, *A History of Chess*. Oxford.
- Murray 1936:
H. J. R. Murray, 'How old is chess?', *British Chess Magazine*: 585–7.
- Murray 1963:
H. J. R. Murray, *A Short History of Chess*. Oxford.
- Murray Papers*:
The papers of H. J. R. Murray (1868–1955) relating to chess and board games [kept at the Department of Western Manuscripts, Bodleian Library, Oxford].
- Needham 1962:
J. Needham, *Science and Civilisation in China* 4 /1. Cambridge.
- Orbeli/Treuer 1936:
J. Orbeli and K. Treuer, *Shatrang: kniga o schachmatach*. Leningrad.
- Pastoreau 1990:
M. Pastoreau, *L'Echiquier de Charlemagne, un jeu pour ne pas jouer*. Paris.
- Petzold 1990:
J. Petzold, 'In search of the origins of chess' [unpublished paper for the Fourth Congress of Chess Collectors International, May 1990].
- Petzold 1994:
J. Petzold, 'These zur aktuellen Forschung über den Ursprung des Schachspiels', *Schach-Journal* 1: 7–12.
- Pratesi 1990:
F. Pratesi, 'Gli Scacchi in India', *Scacchi e Scienze Applicate* 8: 5–10.
- Rajendran 2001:
C. Rajendran, 'Traditional Caturanga as preserved in Kerala', and associated papers in *Working Papers of "Indian Views", A Collection of Papers on Chess and other Board Games*: 19–28. Kelkheim/Taunus.
- Rao 1973:
S. R. Rao, *Lothal and the Indus Civilisation*. New Delhi.
- Rao 1985:
S. R. Rao, *Lothal: A Harappan Port Town*. New Delhi.
- Sanvito 1992:
A. Sanvito, 'The San Sebastian chessmen', *The Chess Collector* 3/1: 17–20.
- Sarkar 1984:
J. N. Sarkar, *The Art of War in Medieval India*. New Delhi.
- Syed 1993:
R. Syed, 'Das caturanga im Manasollasa und einige Bemerkungen zum Schach in Indien', *Beiträge des Südasien Instituts der Humboldt-Universität zu Berlin* 7: 85–131.
- Syed 1995:
R. Syed, 'Caturanga. Anmerkungen zu Alter, Ursprung und Urform des Schachs', *Beiträge des Südasien Instituts der Humboldt-Universität zu Berlin* 8: 63–108.
- Syed 1998a:
R. Syed, 'Der König und sein Berater im altindischen Staat und in Schach', *Arbeitspapiere zum Privatissimum 'Seidenstrasse', Berlin* 20. und 21. Februar 1998: 71–86. Kelkheim.
- Syed 1998b:
R. Syed, 'Wo? Wann? Warum? Wer? Wie? Fragen der Schachhistoriker und Antworten aus indologischer Perspektive', *Arbeitspapiere zum Privatissimum 'Seidenstrasse', Berlin* 20. und 21. Februar 1998: 86–96. Kelkheim.
- Syed 2000a:
R. Syed, 'King Sarvavarman of Kanauj: Did he convey caturanga to Khusrau Anushirvan, the Sassanid?', in M. A. J. Eder (ed.), *Arbeitspapiere/Working Papers. Chess Originated in India. Four Contributions, May 2000*: 1–12.
- Syed 2000b:
R. Syed, 'Terracottas from Kanauj and other cities of Northern India', in M. A. J. Eder (ed.), *Arbeitspapiere/Working Papers. Chess Originated in India. Four Contributions, May 2000*: 14–17.
- Syed 2001:
R. Syed, *Kanauj, die Maukharis und das caturanga. Der Ursprung des Schachspiels und sein Weg von Indien nach Persien*. Kelkheim/Taunus.
- Thieme 1962:
P. Thieme, 'Chess and Backgammon (Tric-Trac) in Sanskrit Literature', in *Indological Studies in Honor of W. Norman Brown*: 204–16. New Haven.
- Thieme 1994:
P. Thieme, *Zur Frühgeschichte des Schachs*. Pfullingen.
- Thomsen 2002:
T. Thomsen, 'Chess in Europe in the 5th century?', *Board Game Studies*, 5: 103–4. Leiden.
- Wakankar 1986:
S. Y. Wakankar, 'A survey of Sanskrit works on the game of chess', *Journal of the Oriental Institute, University of Baroda* 35: 293–303.
- Welch 1985:
S. C. Welch, *India, Art and Culture, 1300–1900*. New York.
- Whyld 1989:
K. Whyld, 'Quotes and Queries no. 4834', *British Chess Magazine*, Dec. 1989.
- Wieber 1972:
R. Wieber, *Das Schachspiel in der arabischen Literatur von den Anfängen bis zur zweiten Hälfte des 16. Jahrhunderts*. Beiträge zur Sprach- und Kulturgeschichte des Orients 22. Walldorf-Hessen.
- Yekta'i 1970:
M. Yekta'i, 'Historical background of chess', *Barrasiha Tariki*, 4/5 and 4/6: 55–67; 5/2: 103–22. Teheran.