



Tracing the Origins of Checkmate Patterns and Paths in Alfonso X's *Libro de los juegos*

Buscant els orígens dels patrons i camins d'escac i mat al *Libro de los juegos* d'Alfons X

Buscando los orígenes de los patrones de jaque mate y movimiento en el *Libro de los juegos* de Alfonso X

Em busca das origens dos padrões de xeque-mate e movimento no *Livro dos Jogos* de Alfonso X

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**Abstract:** The present study interrogates Alfonso X's bibliographic sources through his chess problems' checkmates and move patterns.

**Keywords:** Alfonso X the Wise – *Libro de los juegos* – *Libro del acedrex* – *Shatranj* – Chess – Checkmate Pattern – Retrograde Problem Analysis.

**Resumen:** El presente estudio investiga las fuentes bibliográficas de Alfonso X a través de los patrones de mate y movimiento de sus problemas ajedrecísticas.

**Palabras clave:** Alfonso X el Sabio – *Libro de los juegos* – *Libro del acedrex* – *Shatranj* – Ajedrez – Acedrex – Patrón de mate – Análisis retrospectivo.

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You shall find all my goodness, if you look for't,  
In the bottom of the bag.<sup>2</sup>

## Introduction

Much of the enduring fascination of Alfonso X the Wise's *Libros de acedrex dados e tablas*, also known as the *Book of Games* or *Libro de los juegos* (*LJ*), rests in the beauty of its form and content, from the evident artistry of its sumptuous illuminations down to the less immediately obvious charm of individual moves in its chess games. By highlighting, categorizing, and investigating distinctive checkmate patterns and movement paths in those moves, this study proposes these artifacts of chess wisdom as statistically identifiable penchants of problem composers and compilers, and argues that they therefore likely represent a form of signature which moves us closer to identifying the Wise King's bibliographic sources, not just generally for the whole codex but for many individual problems.<sup>3</sup>

Tracing the origins of chess problems is a puzzle in its own right. Chess scholars since H. J. R. Murray have assessed that the vast majority, roughly 80%, of the *LJ*'s chess problems

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<sup>2</sup> MIDDLETON, Thomas. *A Game at Chess*. Act V, Scene III. This play debuted in 1624. Quote from *The Works of Thomas Middleton*, edited by BULLEN, A. H. London: John C. Nimmo, 1886, vol. VII, p. 133.

<sup>3</sup> The present study expands upon an idea first suggested in my dissertation. "This trident-style checkmate [which forms the threat to (W)hite in Problem 4] is seen with slight variations as to the supporting piece which guards the attacking rook in many other problems throughout the *LJ*'s [...] I suspect that this unique style checkmate may be a type of personal signature which may further help to identify the ultimate source of these problems. It may be significant that it appears as a discarded threat in Problem 18, where as-Suli is portrayed in the miniature." MUSSER GOLLADAY, Sonja. "*Los Libros de acedrex dados e tablas*: Historical, Artistic and Metaphysical Dimensions of Alfonso X's *Book of Games*" (Ph.D. Dissertation). University of Arizona, 2007, pp. 184-5.



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derive from ninth-and tenth-century collections of *mansubat* or problems for *shatranj*, the predecessor of modern chess.<sup>4</sup> These collections were most likely the now lost works of three key authors: *Kitab ash-shatranj* (840-850) by al-Adli, the two-volume *Kitab al-Shitranj* (before 946) by as-Suli, and *Kitab mansubat ash-shatranj* (before 970) by the latter's student al-Lajlaj.<sup>5</sup>

Félix M. Pareja Casañas referred to this legacy as the “paternidad” of the games.<sup>6</sup> Francisco Marcos-Marín and I documented the only textual proof of one of those authors within the *LJ*, within the portrait of tenth-century chess master and writer as-Suli, whose clothing bears his name in Kufic letters.<sup>7</sup> Ricardo Calvo recognized the importance of this portrait to our understanding of Alfonso's “bibliografía ajedrecística.”<sup>8</sup>

Murray also emphasized the value of charting the provenance of chess problems among the various early recompilations of *shatranj* sources but was thwarted from doing so in the case of the *LJ* by “[t]he fanciful arrangement adopted by the compiler, by which he makes

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<sup>4</sup> MURRAY, H. J. R. *A History of Chess*. Oxford: Clarendon, 1913, p. 181. Ricardo Calvo attributed thirty-four *LJ* problems to as-Suli, fourteen to al-Adli, a handful to other Muslim authors, and identified at least twenty-three of the 103 *LJ* problems as original. CALVO, Ricardo. “*El Libro de los juegos de Alfonso X el Sabio*.” *Libros del ajedrez, dados y tablas*. (Madrid: Patrimonio Nacional and Poniente; Garcia, 1987), vol. 2, pp. 122-235.

<sup>5</sup> For an excellent bilingual French-English listing and description of old *shatranj* texts, see CAZAUX, Jean-Louis. “*History of Chess: The Old Texts - Part 2*”.

<sup>6</sup> PAREJA CASAÑAS, Félix. *Libro del ajedrez: De sus problemas y sutilezas de autor árabe desconocido*. Madrid: Estanislao Maestre: 1935, vol. II, p. 14.

<sup>7</sup> *LJ* fol. 17v. MUSSER. *Idem*. pp. 760-4 and 836-8. MARCOS-MARÍN, Francisco. “*Texto e imágen en el Libro de los juegos*.” AATSP Annual Meeting, Alfonso el Sabio Studies Session. Chicago: 2 Aug. 2003 and “*Decifração de textos anómalos em suportes anómalos*.” *Da decifração em textos medievais*. Edited by Ana Paiva Morais et al. Colibrí, 2003 [2004], pp. 43-70.

<sup>8</sup> CALVO. *Idem*. p. 132. Although Calvo misidentified the figure as al-Mahdi (eighth century) and therefore mistook the problem's source, he was correct about the importance of this clue specifically and the people portrayed in the *LJ*'s illuminations overall.



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his order depend upon the number of men employed in the position, [and] effectively conceals his indebtedness to the older works.”<sup>9</sup> Alfonso’s intended arrangement disintegrated at Problem 69 out of 103, perhaps when his quantity of material fell short of the goal of sixty-four folios. To reach that numerological total, the Alphonsine collection repeated some problems and included similar ones; ten positions occur twice, one thrice, and two four times. These repetitions may also bear clues for the historical chess detective in the slight variations of their material, moves, or nuances of technical language tying each one to distinct sources.

Today, establishing exactly who composed many individual *LJ* problems still remains a tantalizing puzzle. This study seeks new ways to ascertain their problemists’ identities by mining deeper identifying features from their textual solutions. Newly examined here are clues in the form of recurring checkmate patterns and paths, only visible when using the accompanying text to play each problem all the way through to its end, including any discarded lines of play and threats to the winner.

Much as retrograde analysis uses knowledge of the rules to chess to figure out which moves were made in a chess game so as to arrive at a certain position, the promising clues marshaled here are to aid future researchers in working backwards to understand how chess problems were copied from one manuscript to another before appearing in the Alfonso’s games codex. Although this study will not immediately answer the question of “Who is the author?” for every problem or checkmate pattern within the *Libro de los juegos*, it pushes a pawn further forward in the quest for knowledge about the provenance of these problems.

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<sup>9</sup> MURRAY. *Idem*. Quote p. 279. See also his table regarding source distribution p. 274.





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## II. What is a checkmate pattern?

A checkmate pattern is rather like a constellation of pieces on the chessboard, with several chessmen of differing magnitudes suggesting or outlining a shape. Some patterns are named for their appearance such as the dovetail, epaulette, and swallow-tail mates. Others like Boden's, Légal's, and Morphy's mates are named for the chess player who made them famous. Classic *shatranj* checkmates in the *LJ* include the famous Dilaram and Abu Naam problems, named for the woman who legendarily suggested the moves and a *shatranj* master respectively.<sup>10</sup>

Another eminent checkmate pattern known to Alfonso X is smothered mate, occurring when a king's own army surrounds him preventing his escape from attack, as in *LJ* Problem 55. Occasionally a pattern's name changes over time. Half a millennium after appearing in two of the earliest Spanish chess masterpieces, the *LJ* (1283) and Luis Ramírez de Lucena's *Repetición de amores y arte de axedrez* (1496), the smothered mate became known rather anachronistically as Philidor's mate or legacy, after eighteenth-century French chess player and music composer François André Danican Philidor.<sup>11</sup> Ever since the earliest of *shatranj*

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<sup>10</sup> Both the Dilaram and Abu Naam checkmates use two rooks and a knight and appear frequently in all early *shatranj* collections. In Dilaram, the winner sacrificed both rooks down the same file but ultimately won the game with a knight giving mate. The *LJ* has three examples of Dilaram in Problems 54, 57, and 90Ψ as well as thematic variations in Problems 46Ψ, 92Ψ, and 100. (The Greek letter *psi* [Ψ] after a problem number denotes that it contains a trident checkmate pattern.) Problems 23Ψ, 34, 41Ψ, and 43Ψ also employ double rook sacrifices. Abu Naam won by sacrificing first a knight and then a rook down a file on one side of the king, ultimately checkmating with the remaining rook on the king's opposite side. The *LJ* has four Abu Naam examples: Problems 58Ψ, 63, 64, and 97. Three of the *LJ*'s tridents appear in three of its Dilaram problems but only in one of the Abu Naam problems. Problem 21 may be an original composition which combines elements of both checkmate patterns.

<sup>11</sup> RAMÍREZ DE LUCENA, Luis. *Repetición de amores y arte de axedrez*. Salamanca: Leonardo Hutz y Lope Sanz, 1496, Problem 103 (p. 132 of 184 of Salamanca PDF) and *LJ* Problem 55 (fols. 38r and 38v). *OXFORD COMPANION TO CHESS*. (Oxford UP, 1992), s.v. "Philidor's legacy," p. 306. See also MURRAY. *Idem*. p. 798 #103 and his Chapter XIV.



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and chess problems, the accompanying diagrams usually display exclusively the indispensable point of departure. Skillful players can often intuit or sometimes clearly envision what checkmates will develop from that opening position, but appearances can also be deceiving. Owing to the chess 'near-infinite variety, problems with similar beginnings may end in different checkmates and thus be distinct problems, as with the *LJ*'s Problem 100 which looks like a Dilaram problem but ends very differently.

Recognizing patterns is a vital skill at all stages of a chess game, up to and especially including the endgame. Therefore, this study looks deeper into each problem than its starting arrangement, and instead zeroes in on what each game's board looks like at the moment of its various mates and what trajectories chessmen take to get there, because that is where the patterns of checkmates and the paths to them are revealed. Chess endings are also worthy of focus because that is where much of their enjoyment lies and why "[c]hess, like love, like music, has the power to make men happy."<sup>12</sup>

For this study I undertook a statistical analysis of all 291 checkmates in the *LJ*'s first treatise or "*Libro del acedrex*," identifying where they take place on the chessboard, which pieces give and support each mate, along with any notable shapes created.<sup>13</sup> Contained within the *LJ*'s 103 chess problems there are almost triple that quantity of checkmates because these occur not only as a single solution to each problem but in multiple possible solutions, in pitfalls which end in early defeat, and especially in what Murray called Muslim-style problems with their explicit threats to the winner which are poised to punish less-than-perfect play. My analysis unsurprisingly confirmed that nearly two-thirds of the *LJ*'s

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<sup>12</sup> TARRASCH, Siegbert. *The Game of Chess*. New York: Dover, 1987 (rpt. of Philadelphia: David McKay Co., 1935), p. xi. Cf. Alfonso's defense of games: "Por que toda manera de alegría quiso dios que ouiessen los omnes en si naturalmientre por *que* pudiessen soffrir las cueytas & los trabajos quandoles uiniessen; por end los omnes buscaron muchas maneras por que esta alegría pudiessen auer complidamientre" (*LJ* fol. 1r).

<sup>13</sup> I am indebted to my beloved husband's spreadsheet wizardry which enabled me to compile and analyze the *LJ*'s manifold checkmate intricacies.



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checkmates occur on the edge of the board, where it is easier to trap the king, and that another nearly two thirds of checkmates are given by one or both rooks, roughly 32% and 31% respectively.<sup>14</sup> The next most likely piece to deliver mate is the knight, with 16%. The combination of the rook and the knight was also particularly powerful, with over a quarter of mates involving diverse configurations of this partnership including one called the trident. The statistical surprise came in seeing how greatly the trident checkmate pattern outnumbered all the other rook-knight patterns.

### III. The trident checkmate pattern in the *LJ*

Formed by a king, rook, and knight stacked perpendicularly to the edge of the chessboard, the trident's tidy linear trio intrigued me.<sup>15</sup> Named for the shape formed by the lines of attack emanating from the rook and knight, the trident's three tines trap and impale the enemy king as illustrated in the diagram below. Surprisingly, this single unusual pattern accounts for nearly 8% of the *LJ*'s checkmates, with a total of twenty-three tridents occurring over twenty problems, as detailed in the table below. In addition to its rook-knight powerhouse, a trident also requires a variable third piece guarding the rook's square.

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<sup>14</sup> These findings are unsurprising because until the chess queen and bishop gained expanded powers in the late fifteenth century, the rook and the knight were the most powerful pieces in the game. Happily for the modern chess player, checkmate positions from *shatranj* and Alfonso's time including the trident are legal and relevant today because the rook's and knight's moves remain unchanged. Only those problems containing pieces whose powers of movement have evolved, if in a position to disrupt the mate, could possibly spoil or "cook" the problem when considered from a modern chess rules. For more these changes in the chessmen's powers and that timing see MCCRARY, John. "[The Evolution of Modern Chess Rules: Enter the Queen and the Bishop](#)" 2 July 2021.

<sup>15</sup> Two other people intrigued by this checkmate pattern have compiled lists of known games in which it occurs but the earliest between Howard Staunton and Elijah Williams dates back only to 1851. The more complete list by username "ChessCoachClark" has only 59 recorded games with the trident mate in the past two centuries. Although the earlier history of this mate is not well documented, this study begins to remedy that lack. Those lists appear at [1](#) and [2](#).



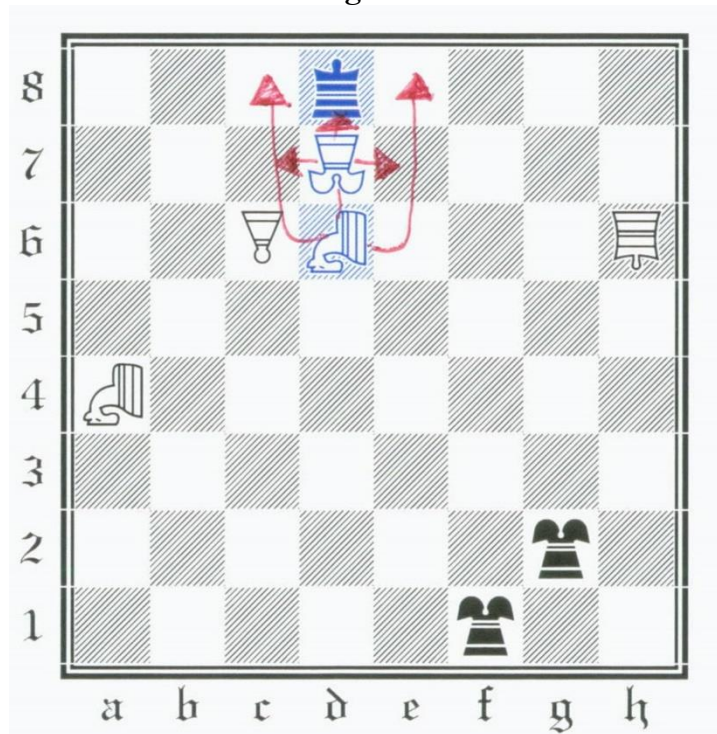


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Notably, Alfonso's "*Libro del acedrex*" contrives to support its tridents with every possible chess piece, from pawn through king and even with the promoted pawn, in an intentionally complete array of variations on a treasured theme.<sup>16</sup> A two-thirds majority of tridents, fifteen out of twenty-three, threaten the prescribed winner should he err in solving the problem; roughly a quarter result from the outcomes of discarded lines of play which end the problem sooner than prescribed; and related Problems 69 and 91 uniquely showcase the trident as their beautiful solutions. Recall that Problem 69 is precisely where Alfonso's intended order for the *LJ*'s problem arrangement changed.

**Diagram 1**



<sup>16</sup> As noted in the table, there are two cases where the trident's support piece has been omitted from its diagram through an apparent error by the illuminator.





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The above diagram shows a trident checkmate position (in blue) at the outcome of *LJ* Problem 67's discarded move. Forming a shape like the Greek letter *psi* ( $\Psi$ ) the lines of attack from the rook and knight (drawn in red) contrast sharply with Black's far simpler threat of Rh1#. To checkmate with a trident requires four precisely choreographed moves. First, a player must confine the enemy king to any edge of the board using at least one rook on an adjacent rank or file. Here the White rook, has just moved from h7, where it confined the Black king on d8 to the eight rank.

Second, the player must control the square immediately in front of the enemy king with another piece of any kind. Here it is the White pawn on c6 controlling d7. Third, a knight must be one leap away from occupying the square directly behind that controlled square, where it will immobilize the Black king as in a vise, preventing him from fleeing sideways along his edge. When the White knight in the diagram moved to d6 it could only have originated from eight possible squares but effectively only six: c4, b5, b7, e4, f5, f7, since c8 or e8 beside the king would have exposed it to capture; in this case the knight came from c4. Fourth, in the final satisfying step, the rook delivers checkmate by sliding exactly between king and knight into the safety of d7, like a key fitting perfectly into a lock.<sup>17</sup>

Since Alfonso's text offered no special name for the trident or any checkmate pattern, I sought some indication of an earlier name.<sup>18</sup> The closest *shatranj* technicality I found was

<sup>17</sup> A modern player may appreciate the trident's similarity to Anastasia's mate. Named for the novel in which it appears, *Anastasia und das Schachspiel* by Johann Jakob Wilhelm HEINSE (1803), it also employs a knight and a rook at the board's edge but without the trio forming an orderly stack.

<sup>18</sup> More recently the trident has been called Vuković's mate after VUKOVIĆ, Vladimir (1898-1975), a Croatian International Master and chess writer who describes it second in the chapter on mating in *The Art of Attack in Chess* (Oxford: 1963). Vuković's clever diagram offers a position where checkmate can be achieved in two ways. The first way is the Arabian mate, which he calls the Arab mate, and the second way he simply calls "a mating pattern which is worth remembering" (e-book pp. 103-4). As with Philidor's mate noted above, this checkmate pattern predates its modern namesake by many hundreds of years.



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*shāh mubaṭṭanān*, but its meaning is contested. Murray translated this phrase to mean an intimate check, i.e. “Rook e7 checking King e8” but Pareja Casañas disagreed, saying that as used in the Rich manuscript it must mean discovered check.<sup>19</sup>

Although intimate check and discovered check are necessarily mutually exclusive situations, if the root of *mubaṭṭanān* means cloak or lined coat, I can envision it being used to mean close enough to stab a king beneath his cloak or as close to the king as a coat is to its lining in one sense, and in another cloak-and-dagger sense that, until its removal, an intermediate piece “cloaked” an attack on the king. If intimate is meant then the technicality applies equally well to both the trident and the Arabian patterns but, in any case, it warned of a type of check as distinct from our focus on checkmates.

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Although Vuković grouped the trident with the most common, typical mates and not among the less usual or exotic ones, this checkmate appears very infrequently even in modern puzzle collections. For example, only a couple appear in László POLGÁR’s classic collection of *5,334 Chess Problems, Combinations and Games* (New York: Black Dog and Leventhal, 2006), including numbers 73, 232, and it is a possible solution for 459 but not the answer given (if after Rf7+ 1. ... Kd8 2. Rd7#). *777 Mate in One* by Hüseyin ÇAMUR (NP, 2020) has more examples but still only a handful including 233, 258, 518 (uniquely away from the edge of the board), 696, and 731. Vuković never won a game using the mate which bears his name; however Bobby Fischer won with a trident in his 1958 “game of the century” against Donald Byrne. See *Donald Byrne vs Robert James Fischer*.

<sup>19</sup> MURRAY. *Idem*. p. 225, citing AH fol. 92v. PAREJA CASAÑAS. *Idem*. Vol. II: cv. This technicality also appears in AH’s Problem 126, comparable to LJ 51 which involves not only an intimate check but also a solution with an intimate mate, but which is not a trident (MURRAY. *Idem*. Diag. 111). The problem cited by Pareja Casañas (diag. 127) does not have a corresponding LJ problem and although about twenty discovered checks occur out of the almost six hundred checks in the LJ, there is only one discovered checkmate, the threat to the winner in Problem 52, which lacks a trident.



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The following table presents key data about each *LJ* trident checkmate from my statistical analysis and previous scholars.<sup>20</sup> Collating and considering these aspects together highlights various trends in provenance, whether known or original, and each trident's role within its problem. These trends are discussed below in section V.

**Table 1. The *LJ*'s twenty-three trident checkmates**

$\Psi$ No.	<i>LJ</i> No.	Role	Coord. and Support	Prov.	Murray	Pareja Casañas BM / Rich	Calvo	Comp . <i>LJ</i> No.
1	4	Threat	Nc3-Rc2- Kc1 pawn b3	As-Suli (H)	292 #173 317 (heading 309); AH 188, C 95, BM 54, Alf. 4, AE 187, S 7, H 62, V 31.	diag. 52 same $\Psi$	172	-
2	6	Discard ed	Nf4-Rg4- Kh4 fers f5	None	303 #392 326; Alf. 6.	-	173	-

<sup>20</sup> MURRAY's encyclopedic tome remains fundamental for historical chess problem research despite occasionally omissions, slight diagram differences, and lack of discarded or variant moves. He omitted *LJ* problems 56, 61, 62, 66, 67 $\Psi$ , 68, 93, and 103. Of course original sources must always be consulted but Murray's research tells us in which sources and where in them to begin. Murray's relevant problem diagrams with comparison notes are found in the chapter "The Game of Shatranj: Its Theory and Practice III," pp. 282-306 and solutions with commentary including attributions pp. 306-35 organized by his diagram numbers. For the *LJ*'s tridents, Murray omits only Problem 67 and he compares five others only to themselves (Problems 6, 9, 44) or their repeated pair (Problems 46 and 92). He compares the remaining seventeen *LJ* tridents to problems from fifteen manuscripts he abbreviates as follows: AE, AH, Al., Alf., BM, C, F, H, Man., Oxf., R, RW, S, V, and Y, whose titles and descriptions are treated in his Chapter X "The Arabic and Persian Literature of Chess," pp. 169-85. PAREJA CASAÑAS' numbering usually does not match Murray's or the folio numbers written in both Arabic script and Arabic numerals on the online PDF's manuscript.



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3	6	Threat	Nc1-Rb1-Ka1 unsupporte d	"	"	-	"	-
4	9	Discard ed	Ng3-Rg2- Kg1 unsupporte d	None	303 #393 326-7; Alf. 9.	-	176	-
5	9	Threat	Nf6-Rg6- Kh6 fers h7, prom. pawn e8	"	"	-	"	-
6	18	Discard ed	Nb6-Rb7- Kb8 pawn a6	As-Suli credits al- Mahdi (V)	293 #181 317-8; AE 180, V 10, BM 13 (text only), Alf. 18 (in XX), H 48 (in XIX).	diags. 12 and 12b; textual lacuna	184	-
7	23	Threat	Nf6-Rf7- Kf8 pawn g6	Al-Adli, as-Suli copied	283 #18 308; AH 26, C 134, BM 23, F 32 = 51, Alf. 23, H 33, Oxf. 47, V 56, R 79.	diag. 22 same $\Psi$	188	23 = 41
8	30	Threat	Nh3-Rh2- Kh1 fil f4	Al-Adli, as-Suli omitted	283 #22 308; AH 30, C 123, BM 133 = 144, F 36, Alf. 30, AE 95, H 27, Al. 3, R 3.	diags. 131, 143 no $\Psi$	192	-
9	41	Threat	Nf6-Rf7- Kf8 pawn g6	Al-Adli, as-Suli omitted	283 #28 308; AH 36, C 52, BM 145, F 42,	diag. 144 no $\Psi$	200, 188	23 = 41





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				(M), copied (Calvo)	Y 10, Alf. 41, AE 37, Al. 2, H 38, R 4.			
10	41	Threat	Nf6-Rf7- Kf8 fers e6, pawn g6	"	"	"	"	"
11	43	Threat	Ne3-Re2- Ke1 pawn f3	Al-Adli	293 #199 318; H 29, Alf. 43.	-	201	43 = 48
12	44	Discard ed	Ng3-Rg2- Kg1 pawn f3	None	304 #398 327; Alf. 44.	-	201	-
13	45	Discard ed	Nf7-Rg7- Kh7 prom. pawn f8	As-Suli? (M), none (Calvo)	285 #70 310; AH 78, C 154, Alf. 45 (in VI).	-	202	-
14	46	Threat	Nf3-Rf2- Kf1 knight f4	None	304 #399 327; Alf. 46 = 92.	-	202	46 = 92
15	48	Threat	Ne3-Re2- Ke1 pawn d3	Later spurious claims	304 #400 327; Alf. 48, F 9 = 84, Man. 56, RW 13: Al. 24, R 28 = 64. same trident	-	204	43 = 48
16	58	Threat	Nb3-Rb2- Kb1 king c3	Abu Naam, al-Adli and as- Suli	284 #53 309; AH 61, C 12, F 56, Man. 62, BM 10 = 194, H 16 = 55, V 55, Alf. 58 = 63 = 64 = 97, Oxf.	diags. 10 no Ψ, 193 same Ψ	210	-



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					149, Al. 11 = 17, R 52.			
17	59	Threat	Nf6-Rf7-Kf8 fers e6	Al-Adli as-Suli omitted	284 #29 308; AH 37, C 53, BM 29, F 43, Alf. 59, H 13, Al. 22, R 8.	diag. 28 same $\Psi$	210	-
18	67	Discarded	Nd6-Rd7-Kd8 pawn c6	None	omitted	-	215	-
19	69	Solution	Nf3-Rf2-Kf1 king e3	As-Suli blindfold (AH)	286 #84 312; AH 97, C 172, F 55, Alf. 69 = 91, V 8, R 20. same trident	-	216	69 = 91
20	90	Threat	Nf5-Rg5-Kh5 rook g1	Dilaram in as-Suli (H), not al-Adli	286 #83 311-2; S 2, AE 38 (in V), AH 96, C 171, F 7, Y 44, Alf. 54 = 57 = 90 = 100 (in V), Oxf. 45, RW 1 (in VII), Man. 57 (in VII), H 70, R 62. same trident	-	207-8, 228	-
21	91	Solution	Nc3-Rc2-Kc1 king d3	As-Suli blindfold (AH)	286 #84 312; AH 97, C 172, F 55, Alf. 69 = 91, V 8, R 20. same trident	-	229	69 = 91
22	92	Threat	Nf3-Rf2-Kf1 pawn e3	None	304 #399 327; Alf. 46 = 92. same trident	-	229	46 = 92



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23	95	Threat	Nc6-Rc7- Kc8 rook h7	As-Suli, Rabrab (S), Muham mad ben Azzayat (H)	287 #86 312; AH 99, C 174, BM 8, S 8, F 44, AE 151, Alf. 38 = 95, Oxf. 97, Man. 17, H 68, R 6.	diag. 8 same $\Psi$	197-8, 231	38 = 95
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#### IV. Other rook-knight checkmate patterns in the *LJ*

Although tridents are the most common pattern among the *LJ*'s seventy-five rook-knight checkmates, these two chessmen can combine to form other checkmates including the Arabian mate and one unnamed pattern whose shape recalls a tulip. The variety of these mate patterns displays an awareness of and appreciation for the beauty of the multiple ways in which the two strongest pieces could cooperate. It also illustrates also how problemists or compilers might evince a preferred style through their pattern selection.

The Arabian checkmate is “a mate given by a rook and a knight unaided by other men, possible only when a king is on a corner square, e.g. Wh: Rb8 (or a7), Nc6; Bl: Ka8. Its modern name may have arisen because the powers of the rook and knight have not been changed since the days of shatranj”.<sup>21</sup> Vladimir Vuković called it the Arab mate and attributed its name to being “recorded in Arabic manuscripts of the ninth century”.<sup>22</sup> The required position of the knight, two squares diagonally in from the corner of the board (i.e. c3, f3, c6, or f6), limits it to a total of eight possible configurations.

A variation on the Arabian, the tulip pattern occurs when the knight and rook occupy the same squares as in the Arabian, but the king is on a square adjacent to the corner rather than in the corner itself (e.g. Ka7 [or b7] in the example for the Arabian mate quoted

<sup>21</sup> OXFORD COMPANION TO CHESS. *Idem.* S.v. Arabian mate. p. 18.

<sup>22</sup> VUKOVIĆ. *The Art of Attack in Chess.* e-book p. 104 of 579.



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above). As with the trident, the tulip requires a variable third supporting piece, in its case to cover the king's remaining flight square. The tulip, like the Arabian and for the same reason, also has only eight possible configurations, not counting variations of the supporting piece. Unlike the trident and the Arabian where the rook delivers mate, in the tulip mate is given with the knight.

Belying the rationale for the Arabian mate's name, the trident occurs much more frequently in the *LJ* than the mere six Arabian or three tulip mates.<sup>23</sup> This disparity may owe to the fact that the trident is not limited to the corners but occurs on any rank or file, so long as the attacking knight, rook, and supporting piece maintain their relative positions with the edge of the chessboard.

Or perhaps its prevalence owes to Alfonso's own affinity for the trident because it is unusual that the Arabian checkmate pattern, supposedly favored or frequent enough in the early *mansubat* collections to have been the sole one to receive a name, appears so infrequently among Alfonso's selections from those very same sources. Whatever the cause, the relative scarcity of Arabian checkmates relative to tridents in the *LJ* could prove instrumental in naming their source problemists.

## V. Tracing the origins of rook-knight checkmate patterns via their *shatranj* roots

Research by Murray, Pareja Casañas, and Calvo has shown that all the above checkmate patterns first appeared in Arabic collections which now only survive in partial copies in the manuscripts cited by Murray.<sup>24</sup> However within the extant compilations, the large degree of overlapping content from multiple authors coupled with absent, conflicting, or doubtful attributions means the question of precisely who composed many problems remains

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<sup>23</sup> Arabian mates occur in *LJ* Problems 54 (twice), 69Ψ, 91Ψ, 95Ψ, and 102. Tulips occur in 12, 52, and 98.

<sup>24</sup> See note 20.





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murky. Devoting attention to the proportions in which the various mate patterns appear within those works might clarify which problem composers and compilers preferred certain types of mates and paths. Focusing on how each checkmate pattern is used in its game, as an artful goal reached through enumerated steps and which could have occurred in a real game or as an artificial-looking threat plopped into impossible scenario, will also contribute to our historical and bibliographic understanding of these problems' origins.

Particularly, the *LJ*'s pairs of comparable problems may enable subtle variations of a problem to be traced to their respective sources in the various reproductions, thus illuminating the sources which Alfonso's organization obscured.<sup>25</sup>

For the remainder of this section, I present findings extrapolated from the table above and previous researchers, suggesting where further textual and checkmate pattern comparisons could confirm or eliminate an Alphonsine problem source. Somewhere in these overlapping data points of copied versus absent problems, similar and identical ones, and those with and without tridents, lie the many of the distinctions necessary to deduce which among many similar sources Alfonso used and ultimately identify as closely as possible who composed each problem.

Murray's comprehensive study provides an overview, relating twelve of the twenty-three *LJ* trident problems to similar ones in other collections, attributing seven to as-Suli's work and five to al-Adli's. He also showed that eleven or roughly half of the *LJ* trident problems,

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<sup>25</sup> For example, Murray specified distinct groups of similar problems for each of the four trident pairs, comparing Problems 23/41/4 with problems from a mostly similar group of manuscripts; 43/48 from a smaller group; 46/92 with no other collection; 69/91 from an identical group; and 6/9/44/67 with no others. Within these groups there is a marked tendency towards Dilaram style problems, with three of those variations containing a trident checkmate compared to only one Abu Naam problem with a trident. See also note 10 on Dilaram and Abu Naam tridents.



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were comparable with problems originating from the AH manuscript and that the same trident mate occurs there in the same role in nine cases.<sup>26</sup>

Turning to the manuscript Murray calls BM and Pareja Casañas calls the Rich manuscript, Murray noted comparisons between *LJ* Problems 4, 18, 23, 30, 41 (2  $\Psi$ s), 58, 59, and 95 and the BM / Rich. However, among the twenty-one *LJ* problems Pareja Casañas includes in his critical edition as comparable to ones in the BM / Rich, he only confirmed three of Murray's eight comparisons — those for *LJ* Problems 4, 23, and 59, which all include tridents performing the same roles and all but one are identified as originating from or copied by as-Suli.<sup>27</sup> *LJ* Problem 59 / Rich 28 is the only trident problem shared by the two manuscripts which originates from an al-Adli antecedent that was not copied by as-Suli.

Although Pareja Casañas does not mention it, the same trident occurs in *LJ* Problem 58 and BM / Rich 193 (but not 10, its other Abu Naam variant), which originated in al-Adli and was later copied by as-Suli.<sup>28</sup> Interestingly Pareja Casañas remained silent about the comparison Murray made for *LJ* Problems 30 and 41, from al-Adli and omitted by as-Suli, perhaps due to their lack comparable tridents. Frustratingly, a lacuna in the manuscript makes it uncertain if Rich 12 contained a comparable trident to that of *LJ* Problem 18, whose important illumination identifies as-Suli by name.

This study's table highlights how eight of the *LJ*'s twenty-three tridents occur within pairs of similar problems whose slight differences in technical language, arrangement, and play could also aid in tracing each problem's bibliographic origin. This is especially true when only one problem of a pair possesses a trident, as with Problems 38 and 95 as well as the

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<sup>26</sup> Unfortunately, the AH manuscript is not freely available online at present though a copy is held at Cleveland Public Library's John G. White Collection of Chess and Checkers. See Sources.

<sup>27</sup> Pareja Casañas compares the following *LJ* Problems (BM / Rich manuscript by Pareja Casañas' diagram number): 1 (50), 4 $\Psi$  (52), 7(40), 12 (44), 14 (21), 15 (17b), 18 $\Psi$  (12, 12b), 22 (9), 23 $\Psi$  (22), 35 (19), 38 (8), 40 (24), 47 (35), 59 $\Psi$  (28), 72 (24), 88 (57), 89 (14), 93 (II: lxxxii note 1), 95 $\Psi$  (8), 96 (57), and 99 (16).

<sup>28</sup> MURRAY. *Idem.* p. 309 #53 and CALVO. *Idem.* p. 210.



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Dilaram and Abu Naam problems. Source attributions for these problems as given by Murray and Calvo plus collections containing comparable problems as listed by Murray, should help confirm or eliminate potential sources. Problems 23 and 41, both with trident threats, are based on an antecedent which first appeared in al-Adli's collection, later copied by as-Suli per Calvo. Murray notes two different comparable problems in BM / Rich for the *LJ*'s pair of Problems 23 and 41, illustrating how very slight differences in a problem can signify separately traceable branches of a problem's genealogy.

Problems 43 and 48 derive from a problem with a trident threat, which appeared only in al-Adli's collection but was so admired that spurious claims of authorship were made a couple centuries later.<sup>29</sup> Problems 46 and 92 both use a trident threat in Dilaram variations, which Calvo deemed original to the *LJ*. Problems 69 and 91 both contain Arabian mates in addition to their tridents and both derive from a blindfold game which as-Suli is said to have won. Finally, Problem 95, with a trident, is comparable to Problem 38 despite its lack of trident, and per Calvo both originated from the same as-Suli problem, which has a trident.

Calvo's study largely concurred with Murray's attributions but also added his own valuable observations about which problems varied enough from the Muslim canon that they were likely to have been created in the Wise King's Sevillian scriptorium. Four out of the six tridents used as discarded threats occur in *LJ* Problems 6, 9, 44, and 67. Murray and Calvo assessed them all as lacking known antecedents, but Calvo went further in stating that they are likely to have been originally composed in Alfonso's court.

Could the Wise King have composed some chess problems himself? Inserting a favorite threat like the trident into a discarded line of play exhibits a similar or slightly higher degree

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<sup>29</sup> Both Murray and Calvo noted one sixteenth-century false legend in the Man. manuscript attributing this problem to a fifteenth-century game over the control of disputed land, played but lost on a jeweled chessboard (MURRAY. *Idem.* p. 327 #400, CALVO. *Idem.* p. 204; both citing F).



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of skill to similar composed threats to the winning side. The simplicity of Problem 67 (this study's Diagram) however looks designed as a lesson to teach the trident pattern and as Calvo notes “difícilmente se puede llamar a esta posición un problema” (CALVO. Idem. p. 215); perhaps Murray omitted it for this reason.<sup>30</sup>

A quarter or more of Alfonso's original or unattributed problems contain tridents mates.<sup>31</sup> The fact that nearly half the *LJ*'s tridents have no known antecedent signals an especial appreciation for that pattern which resulted in the inclusion of problems crafted to model originals he admired. In other words, the trident appears to have pleased Alfonso so much that he both sought out existing *mansubat* with tridents to copy or to which tridents could be easily added, and when he needed new material for his collection, he included imitations of trident problems or contemporary variations inspired by them. Such a high proportion of tridents both copied and imitated alongside the much less frequent inclusion of Arabian mates indicates a clear predilection on the part of Alfonso and/or his compiler in selecting those problems which contain the trident checkmate pattern over others which possibly appeared more frequently in their source material.

Finally, Murray's and Calvo's problem attributions make clear that knowledge of this checkmate pattern can be traced as far back as al-Adli, in whose work it appears as a threat to the winning side. However it also makes clear that it was as-Suli who achieved a win with a trident. That victory marks a significant shift in role from a mere threat, being far more beautiful and skillful than the mere insertion of a ready-made threat because it shows the process of achieving such a mate from beginning to end. The fact that as-Suli's trident occurred in a blindfold game makes it all the more spectacular. Based on the evidence so far, the scale seems to tip in as-Suli's favor over al-Adli's in being the source of more

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<sup>30</sup> Original Problem 68 seems similarly designed to teach the technique of checkmating with two rooks known by many names including lawnmower to rook roll.

<sup>31</sup> *LJ* original problems and those with no known antecedent include the following: Problems 1, 2, 3, 5, 6 $\Psi$ , 9 $\Psi$ , 19, 21, 31, 33, 44 $\Psi$ , 45 $\Psi$ , 46 $\Psi$ , 56, 61, 62, 66, 67 $\Psi$ , 68, 73-77, 83, 92 $\Psi$ , 93, 98, and 103. Tridentes occur in 7 out of the 29.





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tridents for Alfonso. Likely a confirmation of this fact is that the *LJ* illumination which presents an enthroned and haloed as-Suli is itself a trident problem.<sup>32</sup>

## VI. The *LJ*'s checkmate paths and their origins

A checkmate path differs from a checkmate pattern in that, rather than being a shape formed a static cluster of pieces at one moment during play, it is the trajectory the chessmen trace upon the squares of chessboard over the course of one or more moves. The simplest and perhaps most familiar example to any chess player is the straight line created by the attacking rook or modern queen in a back-rank mate. Problems 75 and 83 offer pleasingly linear arrangements of chessmen and linear solutions which force the enemy king to gobble his way through that row of enemy material in a bee-line to his own defeat. Two further problems force-march a doomed king along the board's edge: Problem 33 chases the loser along two sides of the board and may be an original modeled on Problem 47, whose king travels around three sides. By skipping the often fatal corner square, these kings trace graceful checkmate paths with beveled edges.

Arguably the most dramatic checkmate path is the circular one found in *ad-dulabiya* or waterwheel problems. Driven by the knight's uniquely curving move, their graceful arcs and sometimes complete circumnavigations of the board create a geometrical counterpoint to the underlying rectilinear grid. In the *LJ*'s first problem, alternating knight checks chase a beleaguered king in a full circle counterclockwise, winning by repetition of position.

Calvo identified this problem as one of the most important in the Wise King's collection for many reasons, but certainly among those are its complexity, beauty, and uniqueness. Both he and Murray compared it to another waterwheel problem found in many early

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<sup>32</sup> Very often the players in other miniatures gesture at the threatened trident, as in the illuminations for Problems 6, 9, 23, 43, 46, 59, 90, and 95.



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*shatranj* manuscripts, sometimes with fanciful or legendary attributions.<sup>33</sup> Most notably, the lack of a more similar problem for comparison means that the *LJ* waterwheel has no known antecedent marking it as a likely Alphonsine original.

The knight being my favorite piece, I am delighted by the quantity of knight's circuits and double knight attacks occurring within more than a tenth of the *LJ*'s problems and about 5% of its checkmates, including the following examples. Problem 8's two knights chase the king in a half circle counterclockwise before other pieces force him to the corner opposite from his starting position. The moves of the knights in Problem 12 do not form a circle in themselves but they chase the king in a roughly circular path clockwise. Problem 15's alternating knight attacks chase that king in a quarter circle, also clockwise. Problem 40 also features double knight attacks and derives from al-Adli's work, omitted by as-Suli.<sup>34</sup>

In Problem 42, the king is chased clockwise in a half circle by mostly knight checks. Problem 47's solution uses almost entirely alternating knight checks to move the king in a half circle counterclockwise. Problem 65's knight symmetry dazzles as its diagonal opening position transforms to a square-shaped solution and Problem 93's two opposing knights reverse that dance from a square start changing to a diagonal line just before its close. Given the knight's fundamental role in the trident and other rook-knight patterns, it will be useful to inquire into which problemists focused on the knight's unique powers in problems such as these.

Checkmate paths need be neither geometric nor lengthy. One brief path which appears frequently in the *LJ* involves a king confined to just two or three squares desperately fleeing repeated checks as the mating net tightens. In eight problems the king steps in and out of

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<sup>33</sup> MURRAY. *Idem.* p. 279. He presents *LJ* Problem 1 in diag. 388, p. 303, and the solution p. 326 refers back to his diagrams of other waterwheels in diags. 82 and 86, pp. 286-7, and solutions p. 311 and 312. Murray found the earlier problem, ending in checkmate after successive captures more artistic than the *LJ*'s repetition of position. CALVO. *Idem.* pp. 168-70.

<sup>34</sup> CALVO. *Idem.* p. 170.



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a corner square, the most common being three Dilaram type problems: Problem 54 (with four moves between g8 and h8), Problem 57 (three moves between g1 and h1), and Problem 90 $\Psi$  (four moves between a1 and b1). Three other problems also have the king alternating between a corner square and one other: Problem 79 (with seven moves between a1 and b1), Problem 81 (six moves between a1 and b1), and Problem 84 (five moves between g1 and h1). In two further problems, kings dodge a hail of checks by zigzagging among a trio of corner squares: Problem 86 contains eight moves between g1, h1, and h2 and finally Problem 103's doomed king circles the drain for an impressive ten moves on those same squares.

Notably these striking checkmate paths tend to appear in problems without tridents and many are in a later, more European style.<sup>35</sup> Murray and Calvo both suggested comparable problems for most of those described above but since historical chess research has not tended to focus on identifying composers through their statistical preference for certain checkmate paths, the specifics of what that means in terms of pinpointing Alfonso's game bibliography remains to be analyzed.

## Conclusions

Tridents and other checkmate patterns and paths sparkle like hidden gems within Alfonso's *Book of Games*. By offering new veins to mine for bibliographic information, through deeper insights into the penchants and personalities of their chess problemists or compilers, the individual moves of the problems collected by the Wise King, up to and especially including the shapes of their endings, convey intrinsic historical intelligence beyond mere entertainment and aesthetics. To arrive at those valuable nuggets of knowledge from each opening diagram's glimpse into its depths, one must either be gifted with a rare degree of visualization or, like most of us, appreciate the chess lessons and

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<sup>35</sup> No tridents occur in what Murray called the *Lj*'s European supplement of Problems 73 through 87 (MURRAY. *Idem*. pp. 570-3).



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wisdom imparted by the text as we methodically play through each game move by move, seeking those endgame treasures.

Researchers into the history of chess have clearly established that the trident checkmate pattern was among the many known to the earlier chess master al-Adli but that it was perhaps utilized more frequently and skillfully by as-Suli, in both his problem collection and over-the-board play. Problem comparisons have also shown that both *shatranj* masters were admired and copied by Alfonso the Wise, with a probable preference for as-Suli. However, many of Alfonso's chess problems remain unattributed and though tying any single instance of a mate pattern to its author over a millennium ago can result in stalemate, proving a statistical fondness for certain patterns or paths is weightier and more convincing.

Thus, while we have little data about the chess treatises to which the Wise King's scriptorium had access, the deeper retrospective checkmate pattern analysis presented in this study may lead to greater insights into that and Alfonso's problems' genealogy. Combining mate pattern analysis with my previous analysis of the technical language styles in the *LJ*'s chess problem solutions, should aid in the pursuit to discover more specifics about the problemists Alfonso X drew upon for his "*Libro del acedrex*."

The endgame in the search for problem authorship would look like future chess problem researchers proving whether the *LJ*'s checkmate patterns and paths are or are not in fact ludic signatures which further elucidate the Wise King's bibliographic sources. Continuation of this historical problem pattern analysis awaits the scholar possessing the skills with the languages and palaeography to read these manuscripts as well as a keen interest in early chess problems, to compile a statistical analysis of all checkmates in the extant *shatranj* manuscripts and to compare the *LJ*'s solutions word by word with relevant *mansubat*, ultimately seeking the correlations necessary to posit identities for the authors of Alfonso's chessic bibliography.





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Playing a game of chess with a long-dead king is almost magical, close to time-travel. How much more thrilling it would be to travel a few centuries further back in time to share a chess problem with the *shatranj* master who created it. The first thing I would ask him is what he called his checkmate pattern.

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