To Know The Future You Must First Know The Past

by Philip Best

Most chess players, at one point or another, have paused for a moment mid–game to ask themselves the question "How on earth did we ever get into this position?" This is, of course, a rhetorical question, but it is surprising how much information can be gleaned about a game even if you haven't seen a single move.

This article is inspired by two books by Raymond Smullyan, the undisputed master of retrograde analysis. Each book sets out fifty chess problems of the highest quality, guaranteed to be of interest to anyone who knows how the pieces move. But they are no ordinary puzzles. The aim is not to discover what will happen if the game is continued (eg White to move and mate in three), but instead what *must already have happened* to reach the position shown.

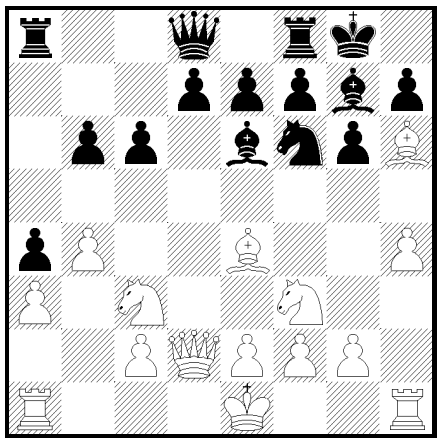
His first book, entitled *'Chess mysteries of Sherlock Holmes'* sets out the problems in true Conan–Doyle style. Written from the point of view of Dr. Watson, Holmes comes across a wide variety of problems, generally involving him turning up in the middle of a game to make some astonishing deduction which he then explains (ably interrupted by Watson and others, to make sure the solution is crystal clear). The second book in the series is *'Chess Mysteries of the Arabian Knights'*, in which the major pieces are given characters and the problems are written from the point of view of Haroun, the White King. Each problem is given it's own story by way of introduction, and again the answers are well explained in words rather than chess notation. I would recommend these books to anyone.

The retrograde problemist has many tools that they can work with, and in the first few problems (composed by me), I hope to demonstrate these, so that you can use your gained knowledge to tackle the last two problems, which are taken from *Arabian Knights* and are the best retrograde analysis problems I've seen. Please have a go at the problems first before you read the solutions.

The most important tool for the problem setter is the pawn – to move away from their initial files they must make captures, and this can put great restrictions on where various pieces were captured. Under–promotion and en-passant are also frequently used.

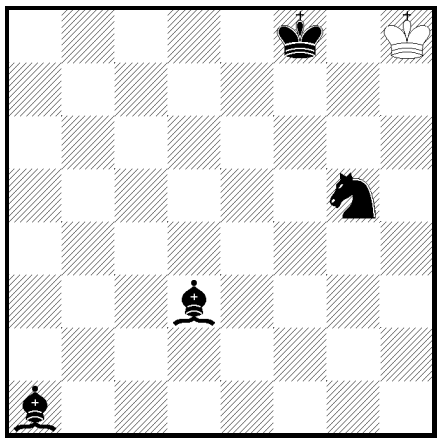
We start with a couple of simple problems:

(1) On which square was the missing Black knight captured?



If we count up the pieces on the board, each side has fifteen. White is missing his d–pawn, whilst Black is missing the knight we wish to trace. The first question we must ask is 'How did the ♗e4 get there?'. Clearly neither the e2 nor g2 pawn has ever moved, so the bishop could never escape from f1. The only possibility is that the original king's bishop was captured on f1, and the one currently on e4 must have been promoted from the d–pawn. Looking at Black's pawn structure, that would only be possible if the pawn went up to d6, then captured on c7 and promoted on c8. Therefore the missing Black knight was captured on c7.

(2) What were the last three moves (half-ply) given that none of them were captures?



The most striking thing about this position is that the White king is in check (in fact check–mate) from the dark-squared bishop. How did Black deliver this check? Clearly not by moving the bishop. Also not as a discovered check from the knight since there is no square the knight could have come from.

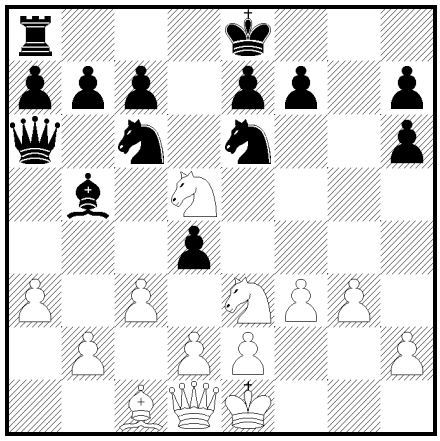
Therefore the only possibility is that Black just promoted a pawn to a bishop on a1. Then what was White's previous move? It must have been with the king from h7 to h8. On h7 it was simultaneously in check from the light-squared bishop and the knight. This is only possible if Black's previous move had been with the knight, moving from e4 to g5, simultaneously delivering and discovering check. Therefore three moves previously, the White king was on h7, and Black had Pa2, ♗d3, ♘e4 and ♔f8. Play contiuned **1**...♘**g5+ 2** ♔**h8 a1(**♗**)#**.

(NB: Without the 'no captures' statement, Black's last move could have been bxa1(B), and White's previous move with the captured piece.)

These problems serve to demonstrate the point made by Holmes to Watson in similar situations: "When you've eliminated the impossible, whatever remains, however improbably, must be the truth".

Now for a rather more tricky problem:

(3) Can Black castle?

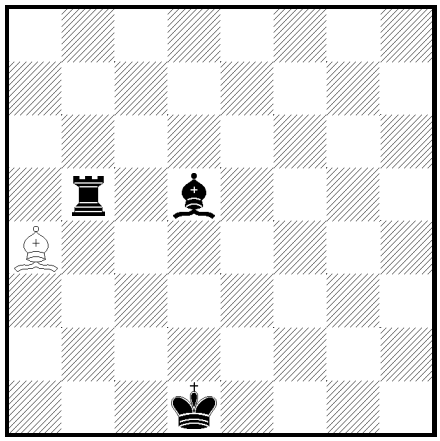


Well, if he can castle then he has moved neither king nor rook. If we count the number of pieces on the board, White has 13 (missing both rooks and his light–squared bishop) and Black has 14 (missing one rook and his dark-squared bishop).

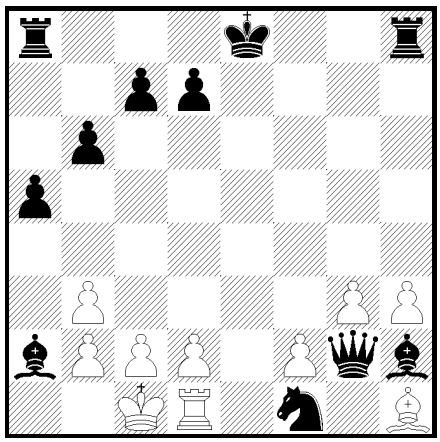
The first apparent thing about the position is that the Black pawn on h6 must have made a capture. What did it capture? It couldn't have been the bishop because the capture was made on a dark–square. Neither could it have been the queen's rook which could never have got out into the game since the ♗c1 has not been able to move. Hence it must have captured the king's rook. How did this get out into the game, given the White pawn structure? The only possibility is that the pawns on f3 and g3 must have cross-captured, so that at some point either the f– or g–file was open for the rook to pass through. These two captures must have been of the missing Black rook and bishop. At least one of these captures must have taken place *before* the capture on h6, to let the White rook out. But before the capture on h6, the pawn was still on g7, trapping the Black bishop on f8 and hence also trapping the king's rook. Therefore the only possibility is that the first capture was the rook originally from a8, and the rook currently on a8 began the game on h8. The sequence of events must have been as follows: the rook from a8 gets captured on f3; this releases the White king's rook, which gets captured on h6; this releases Black's king's bishop and rook; the bishop gets captured on g3 and the rook moves round to a8. Therefore Black can't castle.

Now here's a couple of problems for you to tackle on your own. You'll find the answers with explanation at the end of my other article in this issue. Good luck!

(4) The White king has been knocked off the board. On which square should it be replaced?



(5) Given that it is Black to move, identify the invisible piece/pawn on g4? Also, can Black castle?



An explanation of the Past

Now for the solutions I promised to the retrograde analysis problems. These are (hopefully) set out in such a way that if you got stuck, you can read the first bit to get a hint, and then go back to the problem and keep trying. Anyway, here goes:

(4) It's tempting to argue (fallaciously) that the position is impossible wherever the White King stands. It is apparent that unless the king stands on b3, Black is in check. The White king cannot stand on b3, because it would be in double check from the Black bishop and rook and this would have been impossible to deliver. So, Black is in check from the ♗a4. How did White deliver this check? Clearly not by moving the bishop, so it must have been a revealed check by moving the king from b3 last move (and the king is now on a3 or c3). But if it was on b3, then previously it would have been in the double check which was impossible to deliver!

So, where is the flaw in this argument? Well, instead of the White king simply moving from b3, could it not have made a capture as well? How does this help? Well, the piece or pawn must have moved to c3 or a3, and in doing so revealed check from both the bishop and the rook. Is this possible? Yes! The only possibility is that the pawn came to c3 from b4, capturing a White pawn en–passant. Thus, three half-ply previously White had ♗a4, ♔b3, and Pc2 whilst Black had ♖b5, ♗d5, Pb4 and ♔d1, and play continued: **1 c4 b×c4+ 2 ♔×c3+**. Hence the White king now stands on c3.

(5) The first question to ask is how the ♗a2 got there? Clearly it cannot be original, or else it could never have got passed the Pb3. Therefore it must be promoted. The promoting pawn must have started the game on e7, and hence have made four captures to get to the a–file, plus a further capture on b1. Also, the White queen's bishop can never have left c1, so must have been captured there. This accounts for all six missing White pieces, so the piece/pawn on g4 must be Black.

Since we are given that it is Black's move, White must have moved last. There is only one legal last move, that being castling queenside, so the king must never have moved from e1 before. How then did the king's rook get out to be captured by the e–pawn? Clearly the g– and h–pawns must have cross–captured. Now, given that the Pg3 came from h2, how did the ♗h2 ever get in there? The only answer is that it must also be promoted! The pawn must have promoted on g1 and hence originally have been the g7 pawn (since we have accounted for captures of all the White bits). The order of events was that the g2 pawn captured on h3, then the White rook got out, then the Black g–pawn promoted, and then there was a capture on g3.

Now, since the f–file and h–file have permenently been blocked by a pawn, no further Black promotions can have taken place. Therefore the piece/pawn on g4 cannot be a rook or a queen. It also cannot be a bishop (or castling would have been illegal), nor a pawn (which couldn't capture onto the g–file), so it must be a Black knight!

Now, can Black castle? Well, Black is missing four pieces (two bishops and the pawns from f7 and h7). Three of these were captured on b3, g3 and h3. None of these can have been the f7 pawn which never left it's own file. Also, if you remember, the e7 pawn made five captures on it's way to promotion, and one of these must have either been the White e2 pawn, or its promoted form. Since there is nothing for the e2 pawn to have captured to get over to the d–file, it must have promoted. This might either have been on e8, or on f8 having captured the Black f–pawn (in which case it must have passed through f7). Either way, the Black king must have moved so Black can't castle.