THE PUZZLING SIDE OF CHESS

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## ILLEGAL POSITIONS: WHO'S THE GOOF?

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A chess position is *legal* if it can be reached in an actual game, starting from the initial array and following the rules of normal play. Strategy is not an issue when deciding legality. The moves leading to a legal position may be quite strange.

In many chess puzzles, it is necessary to determine whether a position is legal. Examples are *construction tasks* and problems involving *retrograde analysis*.

Illegal positions are usually something to avoid. A chess composition is considered "flawed" if the position is not legal. However, in this column, all of the positions are intentionally illegal. Your task is to figure out why.
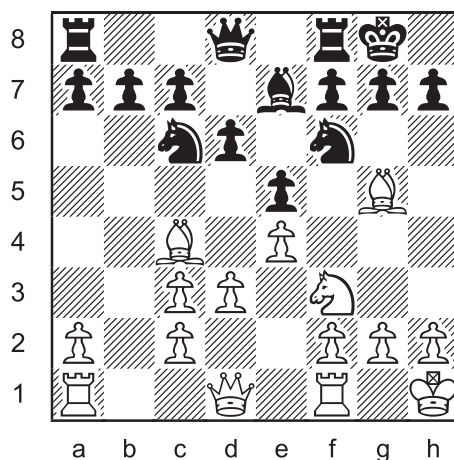
Who's the Goof? 01
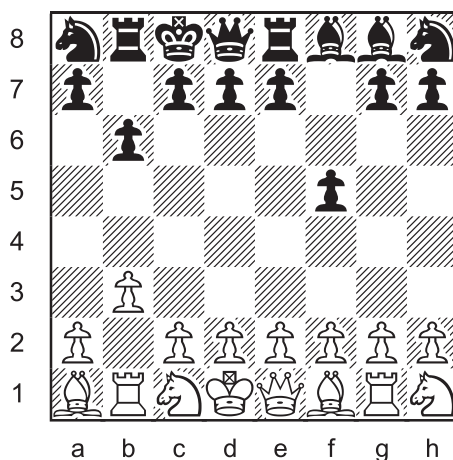
Why is this position illegal?

A lot of things look odd in this diagram. But most of them can be explained by some very weird manœuvres. All except one. Which unusual piece placement is impossible?

If you ever supervised young children playing chess, then you are probably familiar with the typical errors that lead to illegal positions in their games: queen starting on the wrong square, two bishops on the same colour, and my favourite, both kings in check! I don't know if Geurt Gijssen ever discussed this *irregularity* in *An Arbiter's Notebook*, but it can be a tricky situation to deal with. Luckily, most kids are very good-natured when faced with such a predicament.

When I first began making *Who's the Goof?* puzzles, my goal was to teach students about simple "legal mistakes". Eventually the mistakes became more complicated, and finding the goof was a challenge, even for stronger players. The next two positions are not too hard, but perhaps not too easy either.
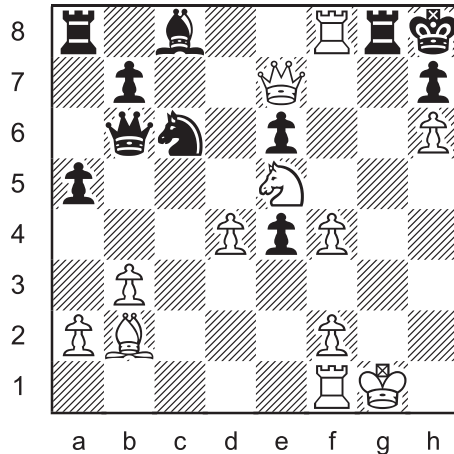
Who's the Goof? 02

Why is this position illegal?
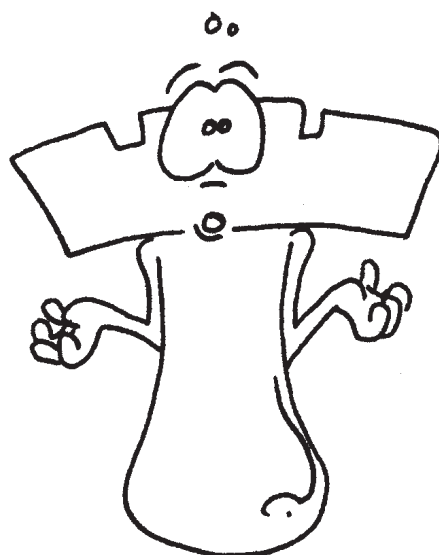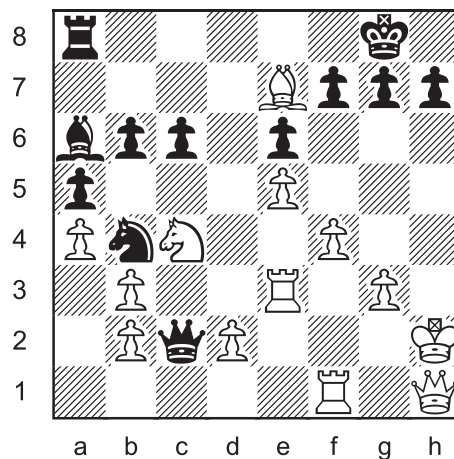
Who's the Goof? 03

Why is this position illegal?

Who's the Goof? problems will appear every two or three months on *The Puzzling Side of Chess*. You may find it surprising how many things can go wrong in a position to make it illegal. But I won't list them here. That might spoil your fun.

The following position takes a step up in level of difficulty.
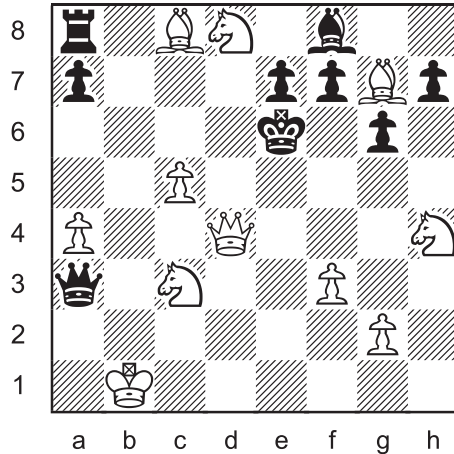
Who's the Goof? 04

Why is this position illegal?

Puzzles which involve retrograde analysis come in various forms. The most common type of retro problems are those where the task is to figure out what the last move was (or the last several moves).

Who's the Goof? is a kind of negative *proof game*. The goal is to prove that a position could NOT happen in a real game. In this sense, it is a legitimate form of retrograde analysis.

Our final two positions should be tough enough to stump some of the master solvers. Good luck!

Who's the Goof? 05

Why is this position illegal?

While searching through various references on retrograde analysis, I was glad to discover a few *Who's the Goof?* puzzles composed by others. Of course, they did not call them "goofs", but they did create problems where the sole task was to determine why the position was illegal.

The oldest example I found was from 1892 by Scottish composer George Hume (1862-1936). He is best known for his work with Alain C. White, collecting problems and editing numerous books.

## Who's the Goof? #6

George Hume 1892
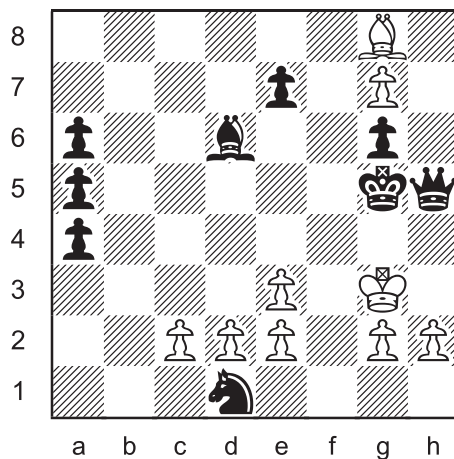
Why is this position illegal?

SOLUTIONS

Problems 1-5 by J. Coakley. Number 1 is a *ChessCafe.com* original (2012). 2 is from *Scholar's Mate 31* (1996), 3 from *Winning Chess Puzzles For Kids* (2006), 4 and 5 from *Volume 2* (2010).

PDF hyperlinks. You can advance to the solution of any puzzle by clicking on the underlined title above the diagram. To return to the puzzle, click on the title above the solution diagram.

Who's the Goof? 01

a b c d e f g h
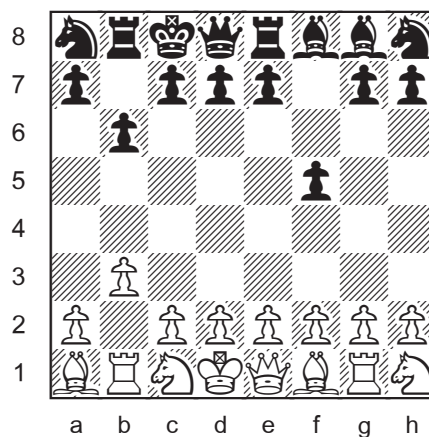
The goof is the black rook on e8. Everything else in the position can be explained "legally".

There is no way the black rook could get from h8 to e8 with an unmoved black bishop on f8 and unmoved black pawns on e7, g7, and h7.

In case you're wondering, the white formation could be reached as follows: 1.b3, 2.Bb2, 3.Nf3, 4.Nc3, 5.Rg1, 6.Ne4, 7.Ng3, 8.Nh1, 9.Bd4, 10.Qb1, 11.Kd1, 12.Kc1, 13.Kb2, 14.Qe1, 15.Kc1, 16.Kd1, 17.Rb1, 18.Ba1, 19.Ne5, 20.Nd3, 21.Nc1. The black king could have gone to c8 via the route e8-f7-e6-d5-c6-b7-c8.

Who's the Goof? 02

[Chess diagram showing position with coordinates a-h and 1-8]
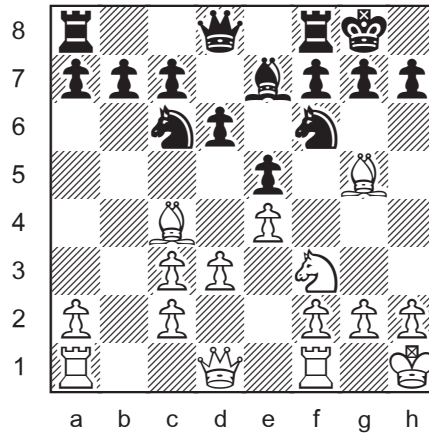
The goof is the pawn on c3.

The only way that the white pawn structure could arise is if the pawn that started the game on b2 took a black piece on c3, which is a dark square. However, Black is only missing one piece, the light-square bishop. And obviously, a light-square bishop cannot be captured on a dark square.

Discovering why a position is illegal is often an exercise in "backwards thinking" (*retrograde analysis*). Taking an inventory of pieces and identifying necessary captures are standard methods.

Who's the Goof? 03

[Chess diagram showing position with coordinates a-h and 1-8]
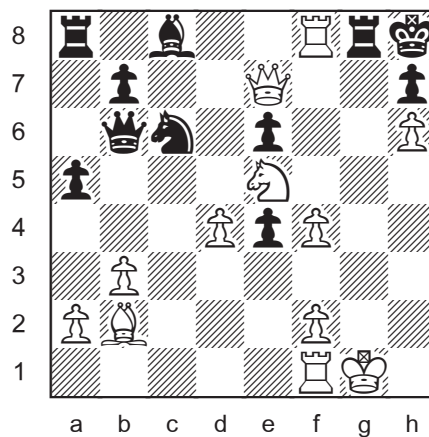
The goof is the black rook on g8, which is checking the white king. Black had no legal move on the previous turn to give this check.

The rook could not have moved to g8 from along the g-file because it would already be checking the white king. *It cannot be Black's turn if White is in check*.

The only potential discovered check was ...Kg7-h8+. But the black king would be in an impossible double check on g7 (from the white queen and h-pawn).

Examining checks is another standard method of retro thinking. Impossible checks, especially double checks, are a frequent "violation".

Who's the Goof? 04
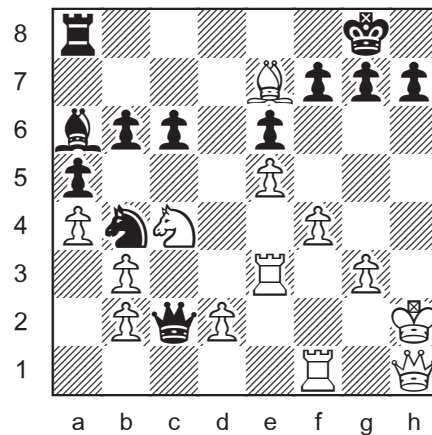
The goof is the white bishop on e7.

White's original dark-square bishop could not have reached e7 from c1 because there are still unmoved white pawns on b2 and d2. A bishop like this, which seems to have miraculously escaped from behind a wall of pawns, is called an *obtrusive piece*.

The white bishop cannot be a promoted pawn either. White has seven pawns on the board, with none on the h-file. To promote into a dark-square bishop, the white h-pawn would have needed to reach d8 or f8, which requires four captures (for example, h4xg5xf6xe7xf8). There are also other ways for White to promote a kingside pawn (g4-g5xf6xe7xf8 plus h2xg3) but they all require at least four captures.

Black is missing exactly four pieces, but one of them was captured on b3 to create the white doubled pawns. So there are not enough possible captures for a white pawn promotion on d8 or f8.

The bishop on e7 is not an original bishop and it is not a promoted bishop, so the position is illegal.

There are sometimes different perspectives on what is wrong with an illegal position. An alternative view of this puzzle, which is essentially the same, is that the white pawn on b3 is the goof. The promoted bishop on e7 required four captures, so there were not enough missing black pieces for White to capture on b3.

Therefore, a more precise solution would be to say that the position is illegal because it requires five captures by White, and Black is only missing four pieces.

In any case, the legality of a chess position often depends on the possibility of a piece being a promoted pawn.

Who's the Goof? 05
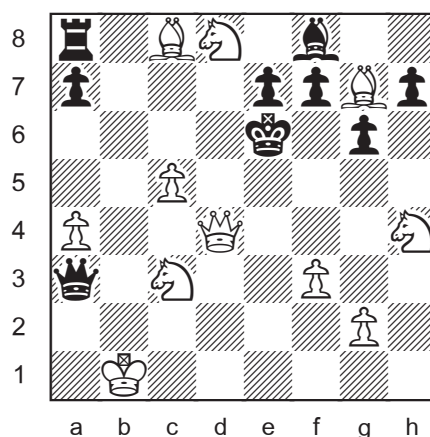
The double check by White with the bishop at c8 and knight at d8 is legal. The last move was d7-d8=N#, combining a discovered check with an underpromotion. The goof is the position before White's move. Black had no legal move on the previous turn to reach that position.

Consider the position before White plays d7-d8=N#. There is a white pawn on d7, the d8 square is vacant, and it is White to play. What move did Black just make?

It's easy to see that the black bishop and pawns did not move. They had nowhere to come from.

The only square the black rook could have moved from is b8, but on b8 it would be checking the white king, and it could not be Black's turn if White is in check.

The same is true for the black queen. She would be checking the white king from any square she could have moved from (a1, a2, b2, b3, b4, c1).

That leaves the black king. He did not move to e6 from d5, d6, e5, or f6 because he would have been in an impossible double check on those squares. Lastly, the king did not move from f5 because he would have been in an impossible check by the white knight at h4. All the squares that knight could have moved from are occupied.

Since Black had no possible move on the previous turn, the position is illegal. This bizarre situation is known as a "retro-stalemate". It is a common occurrence in retrograde analysis and proves that some move leading to the given position was illegal.

Who's the Goof? 06

George Hume 1892

Europe Échecs 14 (October 1959)
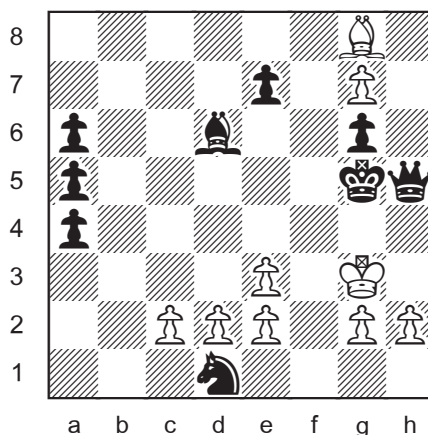
The illegal activity in this position is well hidden. The goof is related to the black bishop on d6 and the white pawn on g7. The black bishop is not the one that started on f8, but that is not easy to prove. It is also not clear why that makes the position illegal. The fact that White stands in checkmate is irrelevant.

Let's gather some information:

The white pawn on e3 could only get there by capturing from f2. That means that the white pawn on g7 must have come from b2, capturing five times on dark squares. The capture on e3 was also on a dark square. So White needs a total of six captures on dark squares to reach this pawn formation.

Black is missing seven pieces: three pawns, two rooks, one knight, and a light-square bishop. Only the capture of the light-square bishop is unaccounted for. The other six black pieces were taken by the white b-pawn and f-pawn.

To prove that the black bishop on d6 is not the original bishop from f8, we need to show that the black pawn that started on g7 was captured on g7.

The white bishop on g8 is a promoted piece because there are unmoved white pawns on e2 and g2. So we can deduce that the white a-pawn promoted to a light-square bishop on a8. It did not

promote on c8 because that would require two captures, and there is only one black piece available (after the six captures by the white b-pawn and f-pawn). We can also deduce that the white a-pawn marched directly down the a-file to a8. It did not capture on the b-file and then return to the a-file because that would again require two captures.

Because the white a-pawn moved directly from a2 to a8, the three black pawns on the a-file each had to be on the b-file at some point in order for the white pawn to pass. Therefore, a minimum of five captures were necessary to create the tripled a-pawns. For example, ...a7xb6, ...b6xa5, ...b7xa6, ...c6xb5, ...b5xa4.

White is missing seven pieces. Since the black a-pawns made at least five captures, that leaves two white pieces available for capture elsewhere. However, one of those two pieces is the bishop that began the game on f1 and it must have necessarily been captured on f1. Because of the unmoved white pawns on e2 and g2, we know that a black pawn did not capture the white bishop on f1. That leaves just *one white piece available for capture* by the black kingside pawns.

The missing black h-pawn is the key to concluding this proof. We know that the three missing black pawns were all captured at some point, either as a pawn or as a promoted piece. We also know that each of those captures could only have happened on these squares: e3, c3, d4, e5, f6, g7.

The black h-pawn never promoted (on f1) because two captures are required to reach the f-file. It was not captured on e3 because three captures are required to reach the e-file. And it was not captured by the white b-pawn on its way from b2 to g7. Since there is no possible way for the black h-pawn to have been captured anywhere, it must be the pawn on g6. It got there from h7 by capturing a white piece. That uses up all the available captures for the black kingside pawns.

Since the black pawn on g6 came from h7, the black pawn that started on g7 is among the missing black pieces. It did not leave the g-file because there are no more white pieces available for capture. Therefore, the black pawn that started on g7 was captured on g7. Whew!

That means that the black bishop on d6 is not the bishop that started on f8. It could never have gotten past the black pawn on e7 or either pawn that always stood on g7 (first black then white).

Consequently, the black bishop that started on f8 must have been captured on f8. So, Black is missing seven pieces, but one was captured on f8 and one is a light-square bishop. That leaves five black pieces available for capture by white pawns on dark squares. But the white pawns require six captures on dark squares. Therefore, the position is illegal.

Once we have shown that the black bishop on d6 is obtrusive (not from f8), there is also another reason why the position is illegal. A promotion to a dark-square bishop would require at least one additional capture (on e1 or g1, for example). So there would not be enough missing white pieces to explain the position of the other black pawns.

George Hume had his own perspective on why this position is illegal. He said the last move had to be ...Bf8-d6#! If the bishop on d6 *is* the original bishop from f8, that would eliminate the legal problems associated with the number of necessary captures relative to the number of missing pieces. But it would mean that the bishop jumped over the pawn on e7, and that is the goof.

Until next time!