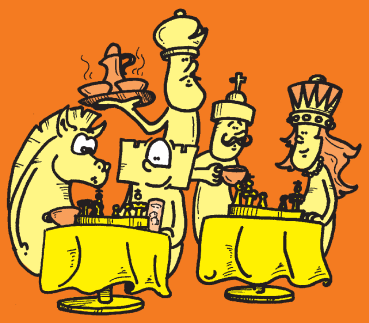


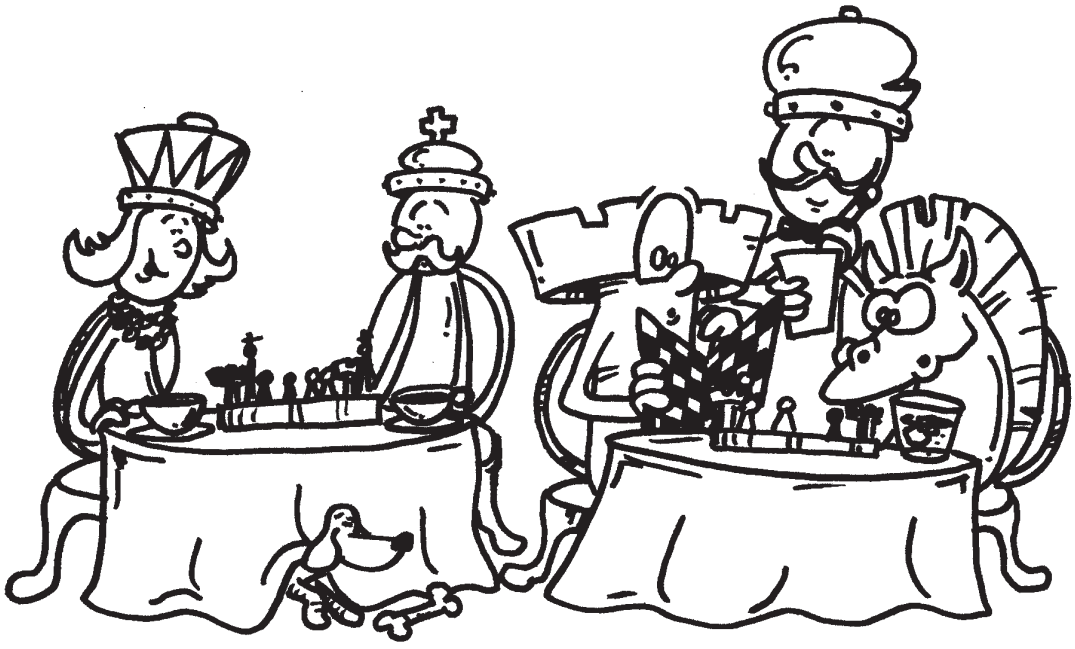
THE PUZZLING SIDE OF CHESS

Jeff Coakley

SEASON TWO: BACK IN BLACK

number 61 July 12, 2014

Welcome, friends, to the Cafe's grand reopening. To celebrate the return of *The Puzzling Side of Chess*, our menu features a smorgasbord of six problems. We hope you find something to suit your taste.

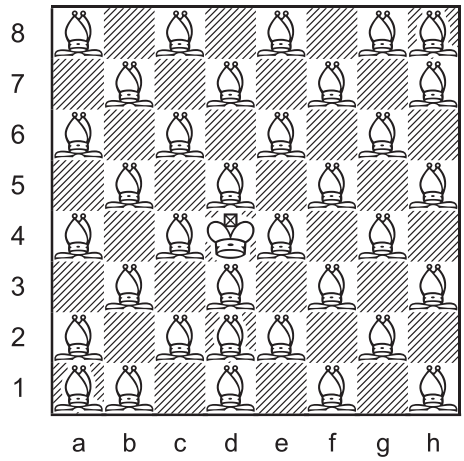


"*Two espressos and a series-mate, please*."

The types of puzzles presented here have all appeared in previous columns. If you are unfamiliar with any of them, examples with more detailed explanations can be found in the archives.

A *triple loyd* is three puzzles in one. In each part, your task is to place the black king on the board to achieve a certain goal. See column 56.

Triple Loyd 32



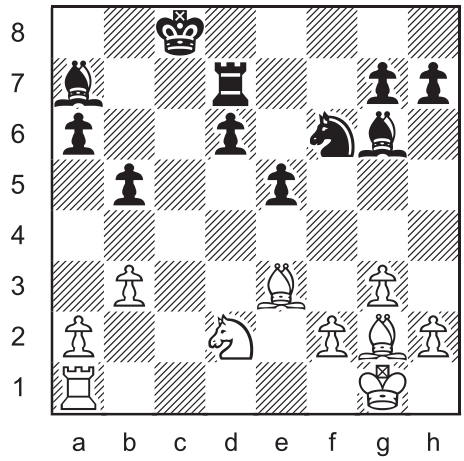
Place the black king on the board so that:

A. Black is in checkmate.
B. Black is in stalemate.
C. White has a mate in 1.

Normally, the positions in a triple loyd must be legal. That is clearly not the case in this special puzzle. For the pure of heart, a lawful version is given on the solution pages.

A *cyclotron* is a three-way switcheroo. Instead of switching two pieces, we switch three. The pieces trade places in a "cycle". Piece A goes to square B, piece B goes to square C, and piece C goes to square A. Otherwise the usual rules for switcheroos are followed. See column 55.

Cyclotron 07



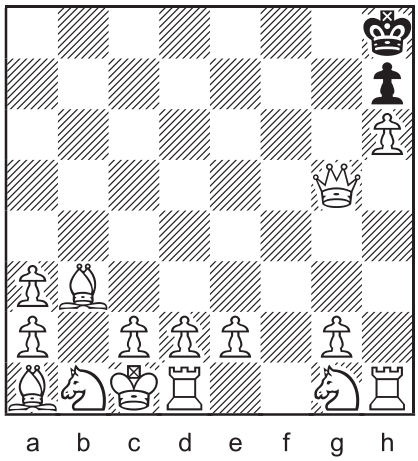
Cycle three pieces so that Black is in checkmate.

Any three pieces may trade places. Colours do not matter.
The resulting position must be legal.

In a *last move problem*, the task is to determine the move or moves which led to the given position.

When answering the question “What was the last move?”, the solver must be as precise as possible. A complete description of a move includes the square a piece moved from, whether a capture was made, and if so, what type of piece was taken.

Retro 23



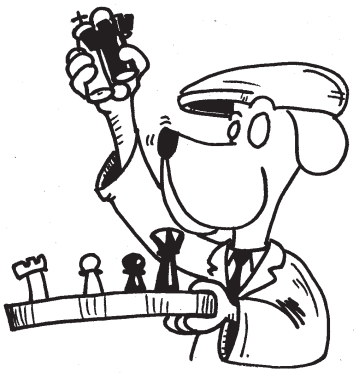
What were the last two moves?

In *last move* problems, moves are counted separately for White and Black. “Last two moves” means one turn by each side (W-B or B-W). For more about retrograde analysis, see column 58.

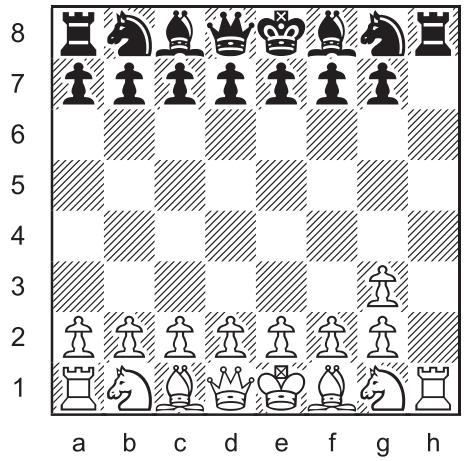
The task in a *proof game* is to show how a given position can be reached in a legal game. See column 52.

The following puzzle is the most general type of proof game. There is no *move stipulation*. You only need to “prove” that the position is legal.

For an extra challenge, use the fewest moves necessary.



Longer Proof Game 03

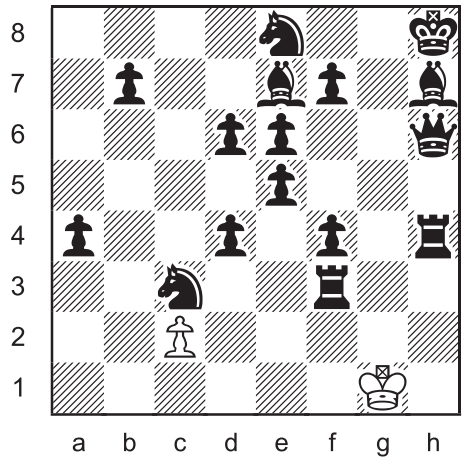


This position was reached in a legal game.
Can you figure out how?
It can be done by White's 11 turn.
(*21 single moves: 11 white, 10 black*.)

I've seen this proof game in various places, sometimes with colours reversed, but the composer's name is never given. Does anyone know the original source of the problem? Thanks.

In a *series-mate*, White plays a specified number of moves in a row to checkmate Black. See column 50 for additional information on series-movers, including *double whammies*.

Multi-Wham 13



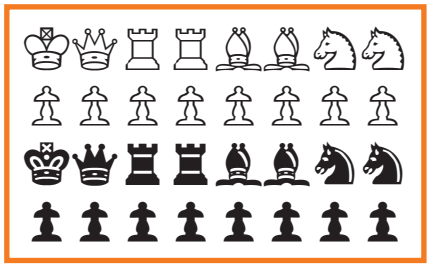
Series-mate in 33

White plays thirty-three moves in a row to mate Black.

Only the last move may give check. Captures are allowed.
White may not place their own king in check. Black does not get a turn.

Our final puzzle is an algebraic beauty by English puzzlist Henry Dudeney (1857-1930). It comes from his excellent book *Amusements in Mathematics* (1917).

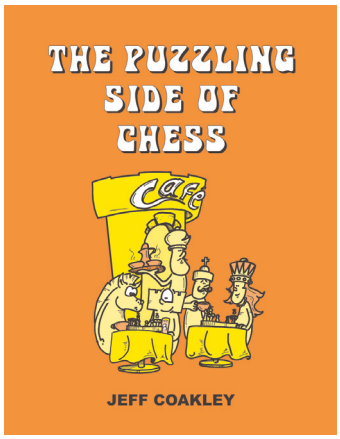
Setting the Board



How many different ways can the pieces be correctly set up for the beginning of a game?

The problem concerns a normal game of chess with a standard board and thirty-two pieces.

To clarify the question, imagine you have a set of chess pieces in a box. The first piece you take out of the box is a white pawn. It can be placed on any of the eight squares along the second rank. The next white pawn can go on any of the other seven squares along that rank. The white pawn after that has six squares to choose from, and so on. Other types of pieces have similar choices.



By the way, in case you were wondering, *Queenfest III* along with a solution for *Longest Perp 12e* will appear in this column at the end of July. Sorry for the delay.

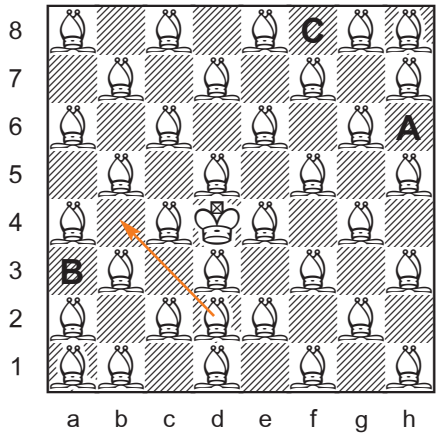
It's good to be back at the cafe. We're open 24/7. Drop by anytime.

SOLUTIONS

Triple loyd 32, cyclotron 07, retro 23, multi-wham 13 by J. Coakley. Retro 23 is from *Winning Chess Puzzles For Kids Volume 2* (2010). The others are *ChessCafe.com* originals (2014).

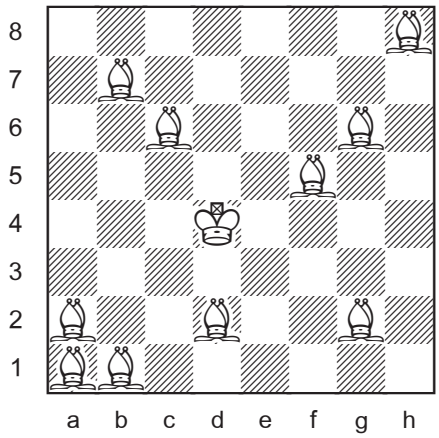
PDF hyperlinks. You can advance to the solution of any puzzle by clicking on the underlined title above the diagram. To return to the puzzle, click on the title above the solution diagram.

Triple Loyd 32



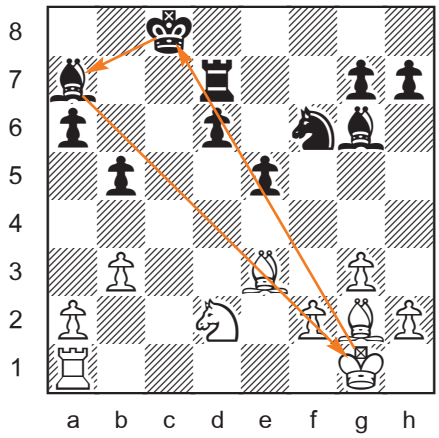
A. Kh6#
B. Ka3=
C. Kf8 (Bb4#)

Thirty-five bishops is perhaps a loyd maximum. Here is a version of the same problem with the legal limit of ten Bs.



Same solution as above. The bishops on b7 and g2 are *weasels*, unnecessary pieces added for distraction or visual effect.

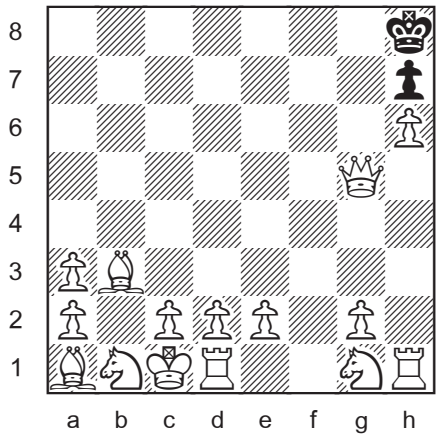
Cyclotron 07



Ba7→g1 Kg1→c8 Kc8→a7

In the cycled position, the black bishop on g1 is legal, the result of a pawn promotion (...f3xg2-g1=B).

Retro 23



The last two moves were:

1. . . . Rb2-b1+
2. Nc3xb1(R)#

a) Black is in check from the bishop on a1, so the last move had to be by White. It was not a move by the white bishop to a1 because the bishop could only get there from along the a1-h8 diagonal, and the black king would already be in check. *It cannot be White's turn if Black is in check.* So the last move had to be a discovered check.

b) It was not 2.b2xa3+ because there is no way a white bishop could be on a1 if there is a white pawn on b2.

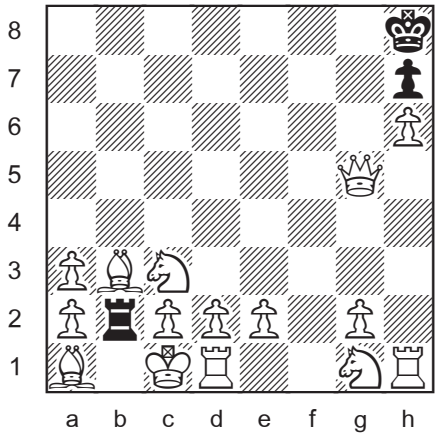
c) That means that the last move was either 2.Kb2xc1# or 2.Nc3xb1#. The move had to be a capture, because otherwise Black would not have a legal move on the previous turn.

Black's previous move was not 1...Kg8-h8 because the king would be in an impossible double check on g8 from the queen at g5 and bishop at b3. It was not 1...Kg7-h8 because the king would be in an impossible double check on g7 from the queen at g5 and pawn at h6. The previous black move had to be by a piece that gets captured by White on b1 or c1.

d) If the white king were on b2, there is no way that a black piece could move to c1, so the move 2.Kb2xc1# is impossible. (A black knight from d3 would be checking the king on b2.)

e) If the white knight is on c3, then black could move a piece from b2 to b1. A black pawn or queen would be checking the white king from b2, so it had to be a black rook that moved to b1. This move was not a capture because White has fifteen pieces on the board, and we know, based on the pawns at e2 and g2, that the only missing piece is a bishop that was taken on f1. The bishop on b3 must be a promoted pawn.

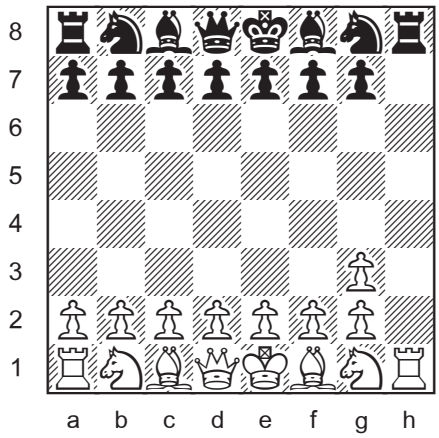
The earlier position, with Black to move, looked like this.



Longer Proof Game 03

composer unknown

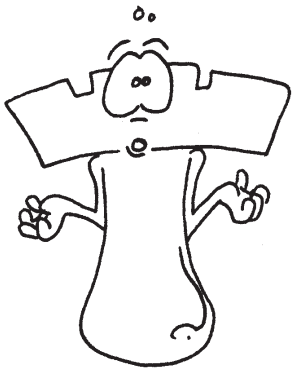
Winning Chess Puzzles For Kids 2004



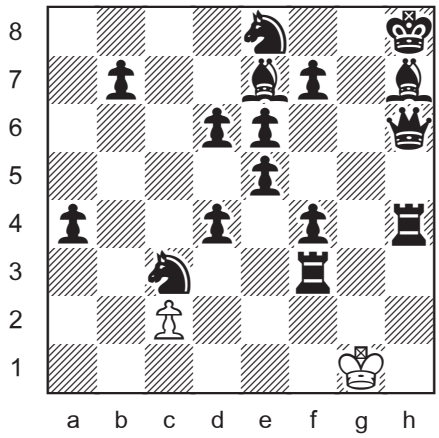
The *shortest proof game* is 20.5 moves.

1. Nc3 h5
2. Nb1 Rh6
3. Nc3 Rg6
4. Nb1 Rg3!
5. hxg3 h4
6. Nc3 h3
7. Nf3 h2
8. Rg1 h1=R!
9. Nb1 Rh7
10. Rh1 Rh8
11. Ng1

The solution is not unique. There are many ways to reach the position. The key idea is underpromoting to a rook on h1.



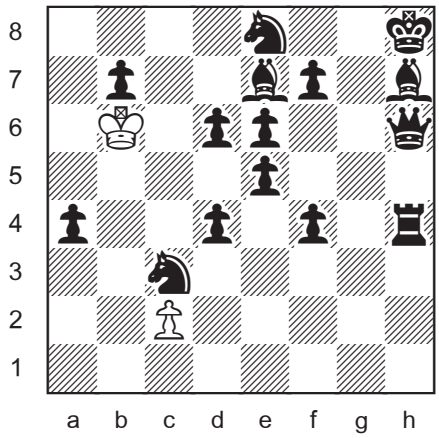
Multi-wham 13



series-mate in 33

A white king with one pawn versus the entire black army. That doesn't seem fair, but given enough turns in a row ...

1. Kg2 The early moves are easy. The white king must capture the black knight on c3 in order to free his c-pawn.
2. Kxf3
3. Kf2
4. Ke1
5. Kd2
6. Kc1
7. Kb2
8. Ka3
9. Kb4
10. Ka5
11. Kb6 The first "fork in the road".



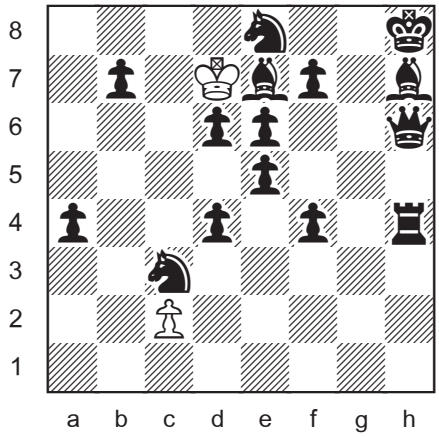
12. Ka7! Surprisingly, the king must avoid capturing on b7, even though it would save one move in freeing his pawn. See analysis next page.

After 12.Kxb7, 13.Kc8, 14.Kd7, 15.Kxe8, 16.Kxe7, 17.Kxd6, 18.Kxe5, 19.Kxd4, 20.Kxc3, it will take White an additional fourteen moves to checkmate Black, one over the stipulated limit. 21.Kd4, 22.c4, 23.c5, 24.c6, 25.c7, with two possible continuations:

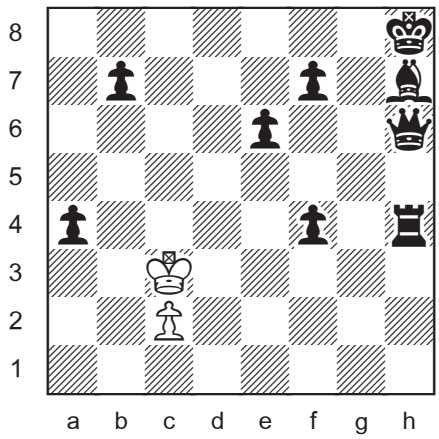
a) 26.Ke5, 27.Kd6, 28.Ke7, 29.Ke8, 30.c8=Q, 31.Qxe6, 32.Qxh6, 33.Kxf7, 34.Qg7#

b) 26.c8=N, 27.Ne7, 28.Nf5, 29.Nxh6, 30.Ke5, 31.Kf6 32.Kxf7, 33.Kf8, 34.Nf7#

13. Kb8
14. Kc8
15. Kd7 Now the chain of defenders guarding c3 is removed.

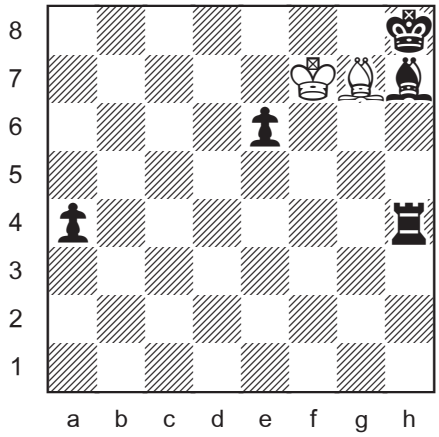


16. Kxe8
17. Kxe7
18. Kxd6
19. Kxe5
20. Kxd4
21. Kxc3 Mission accomplished.



22. Kd4
23. c4! The remaining moves must be played in a precise order.

24. c5
25. c6
26. cxb7 Now the capture is essential.
27. b8=B! A dark-square bishop will be the hero of this tale.
28. Bxf4
29. Ke5
30. Bxh6
31. Kf6
32. Kxf7
33. Bg7#



Setting the Board

Henry Dudeney 1917
Amusements in Mathematics

The chess pieces may be set up correctly for the beginning of a game in **208,089,907,200** different ways.

That's 200 billion plus! Who would've guessed?

Let's begin this math exercise by figuring out the number of ways that the white pieces can be set up.

The eight pawns can be placed in any order on the eight squares of the 2nd rank. The number of different arrangements is "8 factorial", which is written 8! in mathematical notation.

8! = 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1 = 40,320

Once the pawns are placed, there is no choice about where to put the king and queen. Their placement is exactly determined. However, the two rooks, two knights, and two bishops all have a choice of two squares.

Therefore, the number of ways that the white pieces can be set up correctly is given by the following multiplication.

40,320 x 2 x 2 x 2 = 322,560

Obviously, the number is the same for the black pieces.

To calculate the total number of different arrangements for all thirty-two pieces, we must multiply this number times itself.

322,560 x 322,560 = 104,044,953,600

But we're still not done. As Henry Dudeney explains, "The point that nearly everybody overlooks is that the board may be placed in two different ways for every arrangement."

There are two light-square corners on a chessboard, and either one can be at White's right hand. Therefore, we need to double the amount calculated above.

104,044,953,600 x 2 = 208,089,907,200

Until next time!

[Chesscafe.com was on "hiatus" from February to July 2014.]