

THE PUZZLING SIDE OF CHESS

Number 199 February 28, 2021

PEACE BUTTONS

Jeff Coakley & Andrey Frolkin

This article presents eleven unusual retro problems. The diagrams have black and white buttons instead of pieces. The buttons are the “bases” of the pieces without the “tops”. They indicate which colour pieces are on which squares. The types of pieces on the board are stipulated. The task is to figure out which tops go on which bases. In other words, to determine a legal position.

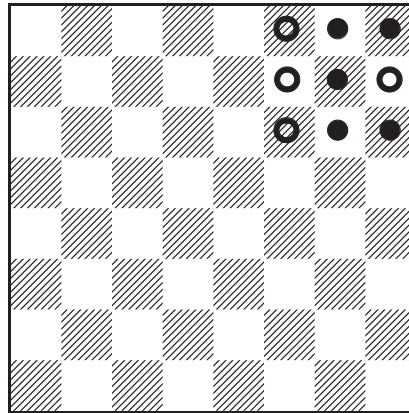
The puzzles start off relatively easy, but gradually increase in difficulty. In the latter problems, the task includes determining several last moves. The current “button record” is 23 single moves!



Our interest in composing button problems of this type began with a suggestion by Nina Omelchuk, as illustrated in her painting on the previous page. But the idea is not entirely new. Andrei Kornilov developed a similar concept nearly 40 years ago. The final problem in this article is an example from 1983. It seems that Andrei was always ahead of his time.

Button Tops 01 was in column 195. So our first puzzle is number 2.

Button Tops 02



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.

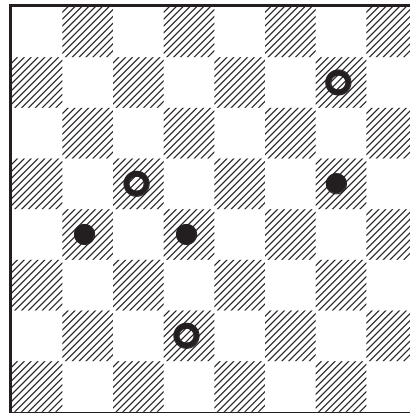


Determine the position.



The next two problems are simple exercises in button tactics.

Button Tops 03



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.

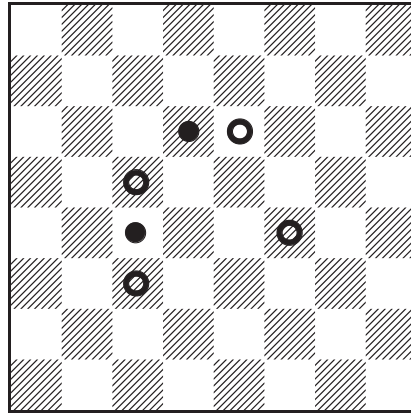


Determine the position.



Peace Buttons

Button Tops 04



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



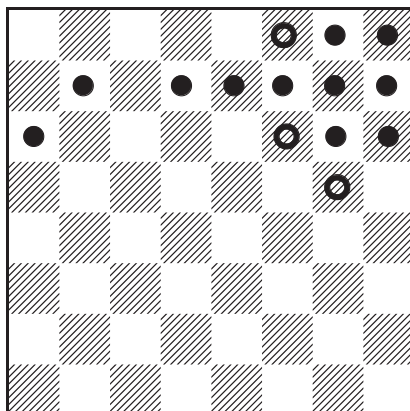
Determine the position.



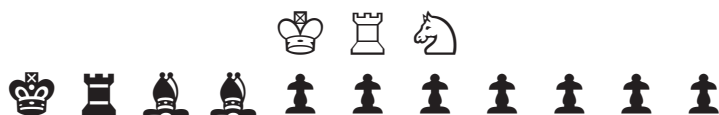
The peace symbol was designed in 1958 by British artist Gerald Holtom. The inner lines are a combination of the semaphore signals for letters N and D, standing for *nuclear disarmament*. Today, 60 years later, there are over 13,000 nuclear weapons in the world.

That's enough of the elementary stuff. Time to get a bit more retro.

Button Tops 05



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



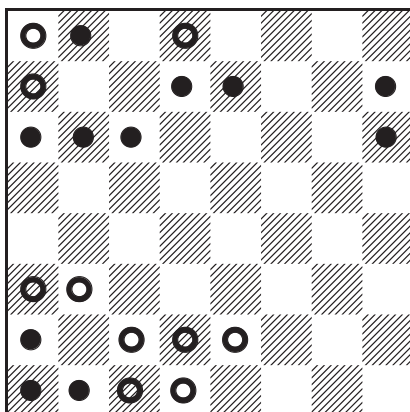
Determine the position.



Button Peace

Things are much more retro in this problem. You are asked to find the last four single moves.

Button Tops 06



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



Determine the position and the last 4 moves.

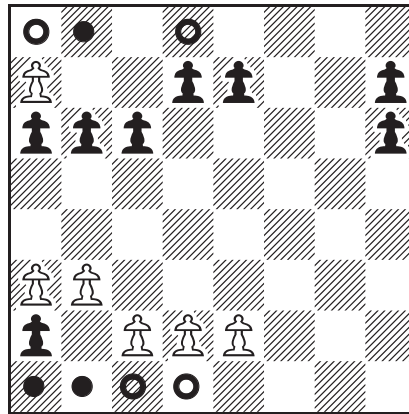


Most interesting retro concepts involve pawns in one way or the other. As you may have noticed, they are a limiting factor in this kind of problem. It is difficult to compose complex positions with officers on the 2nd to 7th ranks when pawns are among the pieces to be added. To circumvent this restriction, the placement of the pawns is a given in the remaining problems. Only the officers are represented by buttons.

In problem 06 above, there are 14 pawns to add and 14 buttons on the 2nd to 7th ranks. That part of the puzzle is too easy. A more straightforward version of the same problem is 06b at the top of the next page, showing the pawns on the board.

Button Tops 06b

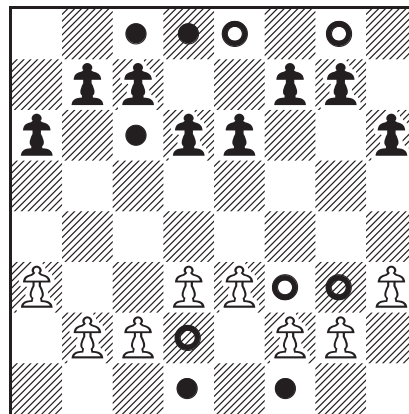
Exactly the same as 06 with pawn placement shown.



Determine the position and the last 4 moves.



Button Tops 07



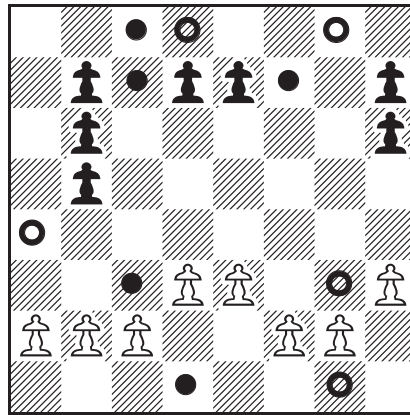
Hollow buttons are white pieces. Solid buttons are black.

The following pieces are on the board.

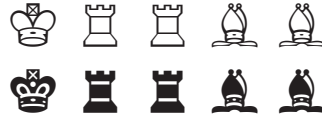


Determine the position.

Button Tops 08



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



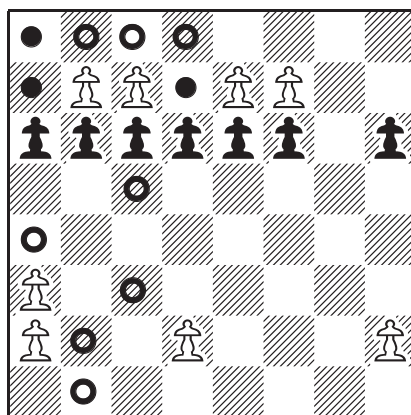
Determine the position.



The olive branch is a symbol of peace dating back to ancient Greece. Doves are portrayed as messengers of peace and love in the bible. In 1949, a painting of a dove by Pablo Picasso became the emblem of the *World Peace Council*.

The next three problems are the *Peace Button* star attractions. Piece assignment hinges on determining the last 3, 9, and 23 moves.

Button Tops 09



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



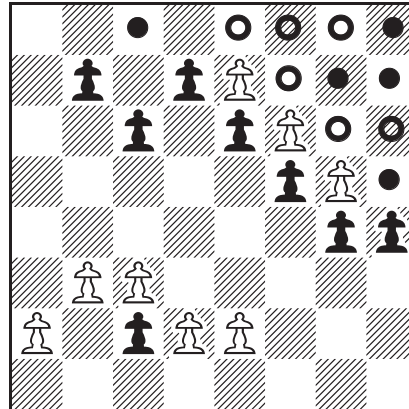
Determine the position and the last 3 moves.

[May 2021: This position is a corrected version of the problem as originally published, with white button b4, black button h5 (instead of b1 and h6). Thanks to Andrey Gorlin for pointing out a cook (c8 d8 = rooks). An improved version of the problem with the last 8 moves determined is given on the solution pages.]



In the following problem, ten pieces are crammed inside a cage. Their mobility is limited to one piece, one square at a time. The retroplay can be likened to a “merry-go-round”. Nine moves are required to initiate a release of the position. Can you open the door?

Button Tops 10



Hollow buttons are white pieces. Solid buttons are black.

The following pieces are on the board.



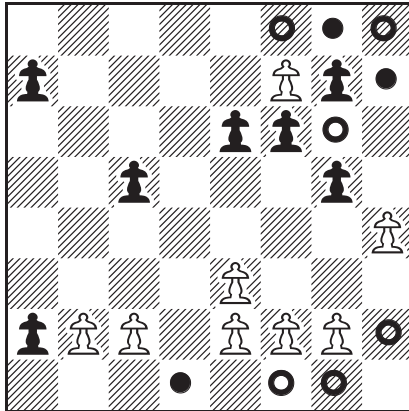
Determine the position and the last 9 moves.



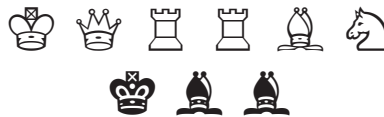
One of the primary goals in retro composition is to maximize the number of last moves that can be determined. The initial version of problem 11 was 11 moves deep. Eventually it grew to a record 23.

The similarity between button problems and chess rebuses is obvious. This particular puzzle is the perfect example. The same position can be presented in either form. The rebus is given on the solution pages.

Button Tops 11



Hollow buttons are white pieces. Solid buttons are black.
The following pieces are on the board.



Determine the position and the last 23 moves.



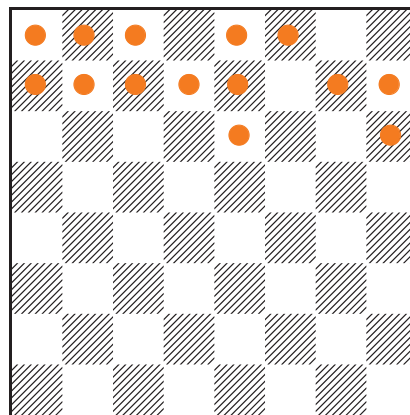
Our article concludes with a blast from the past, co-composed by co-author Andrey and his dear departed friend Andrei Kornilov. In this form of problem, all of the buttons are the same colour. No indication is given for which are white pieces and which are black.

When originally published, X's were used instead of buttons.

Colouring Buttons

Andrey Frolkin & Andrei Kornilov 1983

Multiplex



Buttons represent the following pieces.



Determine the position.



Piece on Earth

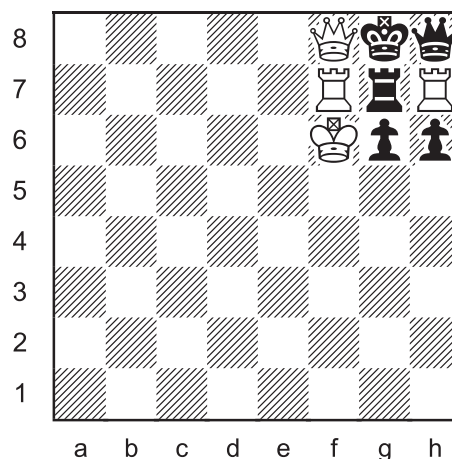
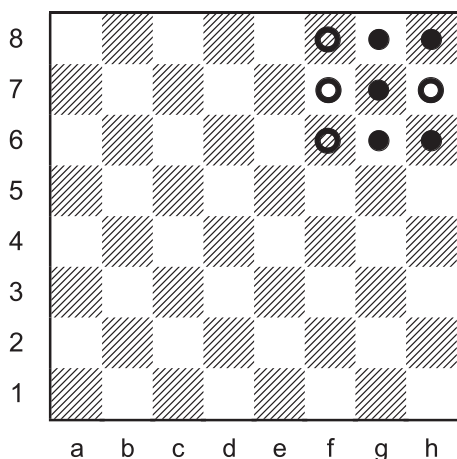
SOLUTIONS

All *button top* problems are joint compositions by Andrey Frokin and Jeff Coakley, *Puzzling Side of Chess* (2021). Number 2 is also jointly composed by Nina Omelchuk.

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.

Archives. Past columns are available in the *Puzzling Side* archives.

Button Tops 02

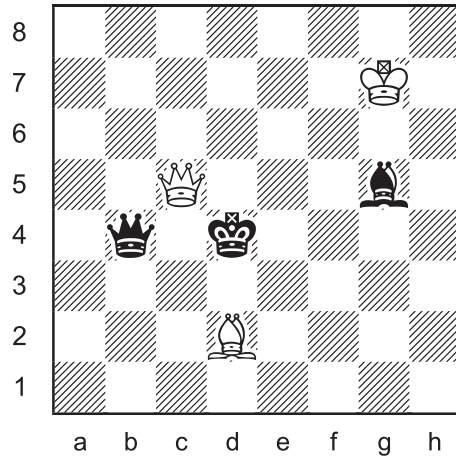
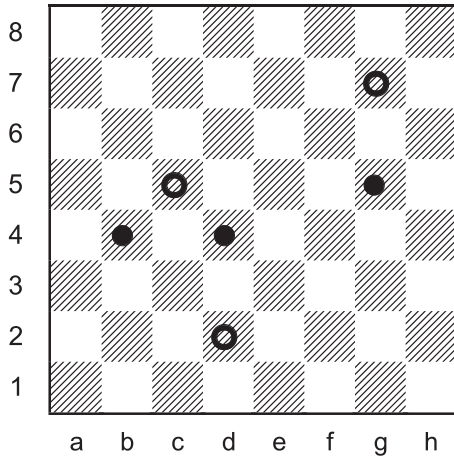


(4 + 5)



- h7 = ♖ h7 ≠ ♔ Adjacent to black king.
- h7 ≠ ♕ Impossible check to black king.
- ♔ = g6 or g8 (g7 h6 h8) ≠ ♔ Impossible check by ♖h7.
- f7 = ♖ f7 ≠ ♔ Adjacent to black king.
- f7 ≠ ♕ Impossible double check (♔f7 and either ♖f8 or ♖f6).
- f6 = ♔ f8 ≠ ♔ Adjacent to black king (g8) or impossible check by ♔g8 or ♖g8.
- g8 = ♔ g6 ≠ ♔ Adjacent to white king.
- f8 = ♔ Check. Last move: 1.Q>f8+ or 1.exf8=Q+
- g7 = ♖ g7 ≠ (♔ ♖) Impossible check.
- h8 = ♔ h8 ≠ ♖ On 8th rank.
- g6 h6 = ♖

Button Tops 03



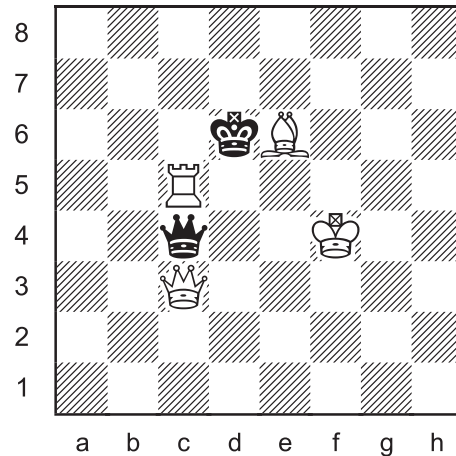
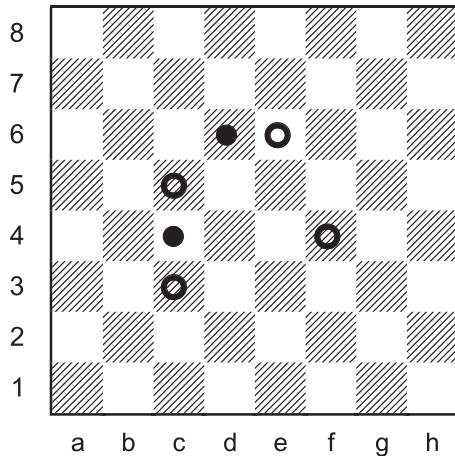
(3 + 3)

Regardless of piece assignment, the black king is in check by the white queen or bishop.

- | | | |
|--------|--------------------|--------------------------|
| b4 = ♔ | (d4 g5) ≠ ♔ | Both kings in check. |
| g7 = ♕ | (c5 d2) ≠ ♕ | Both kings in check. |
| d4 = ♔ | d4 ≠ ♗ | Both kings in check. |
| g5 = ♗ | | |
| d2 = ♗ | d2 ≠ ♕ | Impossible double check. |
| c5 = ♕ | Last move: 1.Q>c5+ | |



Button Tops 04



(4 + 2)



Regardless of piece assignment, the white king is in check by the black queen.

d6 = ♔

c4 ≠ ♔

Both kings in check.

c4 = ♔

c3 = ♔

(c5 e6 f4) ≠ ♔

Both kings in check.

f4 = ♔

(c5 e6) ≠ ♔

Adjacent to black king.

e6 = ♗

e6 ≠ ♖

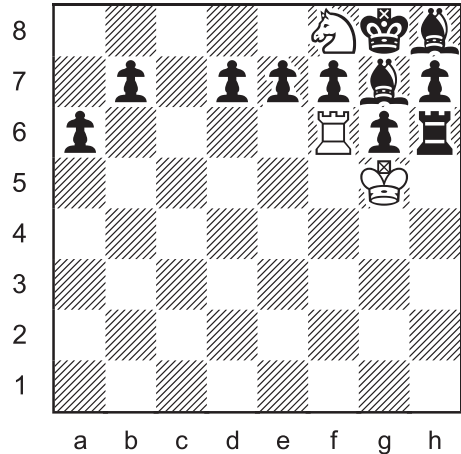
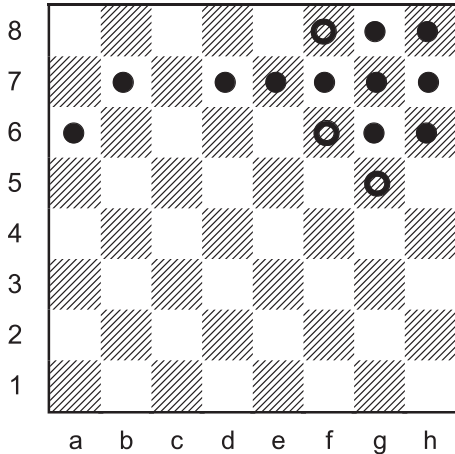
Both kings in check.

c5 = ♖

Last move: 1...Q>c4+



Button Tops 05



(3+11)

a6 b7 d7 e7 = ♚

If any of them is not a pawn, there are 4 black pawns on the fgh-files in an impossible formation.

f6 ≠ ♚ Impossible check (♚e7).

f8 ≠ ♚ If f8 = ♚

g8 = ♖

g8 ≠ ♚

Adjacent to white king.

g8 ≠ ♖

Impossible check.

f7 = ♗

f7 ≠ ♚

Adjacent to white king.

f7 ≠ ♖

Impossible check.

f7 ≠ ♗

Black's original light-square bishop was captured on c8. With 7 pawns, Black cannot have 2 light-square bishops.

g7 = ♖

g7 ≠ ♚

Adjacent to white king.

g7 ≠ ♖

Impossible check.

g7 ≠ ♗

If g7 = ♗, Black's original dark-square bishop was captured on f8. In that case, Black cannot have two bishops.

h7 = ♚

h7 ≠ ♗

Impossible bishop on g8.

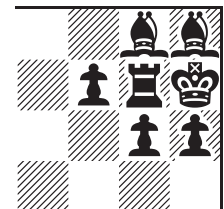
h7 ≠ ♖

Black cannot have 2 light-square bishops.

g7 = ♗

g6 h6 = ♗

The black pieces are in an unreleasable cage.



g5 = ♚

h6 = ♖

h6 ≠ ♚

Adjacent to white king.

h6 ≠ ♗ ♗

Impossible check.

$g7 \neq \text{♗}$ If $g7 = \text{♗}$

Black's original bishops were both captured (c8 f8), so with 7 pawns, there cannot be two black bishops.

$f7 \ g6 \ h7 = \text{♗}$ Remaining black buttons not on 8th rank.

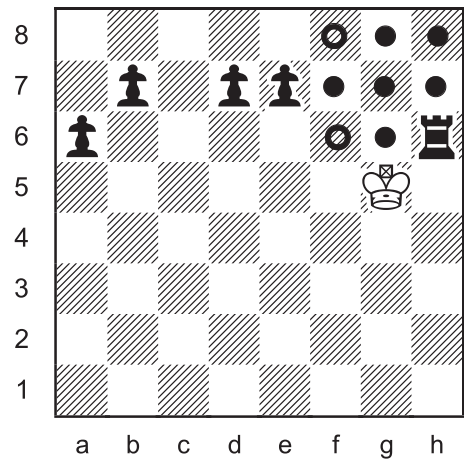
$g8 = \text{♔}$ $g8 \neq \text{♗}$ Impossible with pawns on f7 and h7.

$g7 \ h8 = \text{♗}$

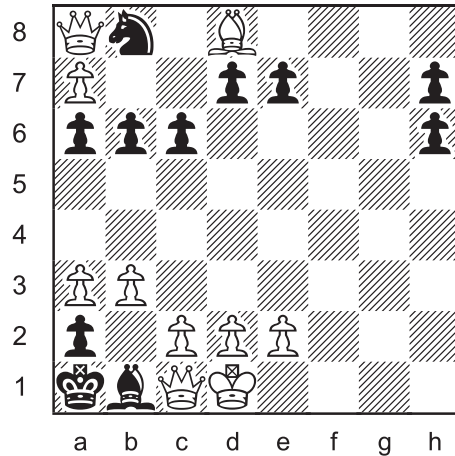
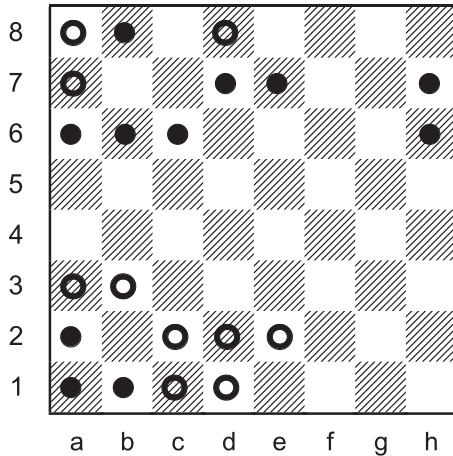
$f8 = \text{♘}$ If $f8 = \text{♖}$ Check.

$f6 = \text{♘}$ Impossible double check.

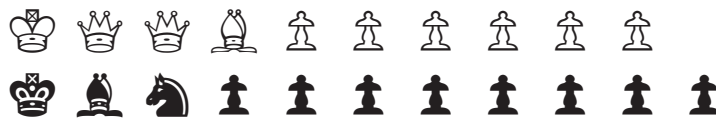
$f6 = \text{♖}$



Button Tops 06



(10 + 11)

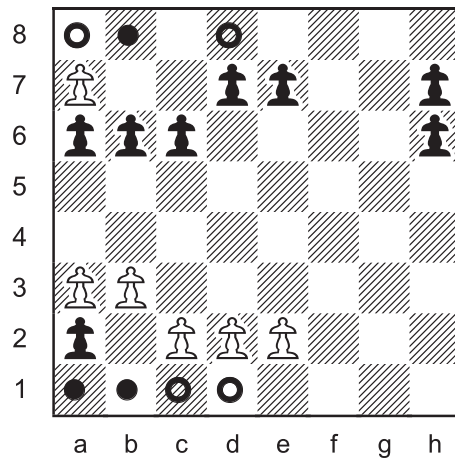


There are 14 buttons not on the 1st or 8th ranks and 14 pawns to add. So the assignment of pawns is easy as pie. See diagram below.

The white pawn on a7 made 5 captures from f2, all on dark squares. That accounts for all 5 missing black pieces.

White has two queens. The white g-pawn promoted to queen on g8.

The black pawn on a2 made 5 captures from f7, all on light squares. The black pawn on h6 captured from g7. The piece taken on h6 was necessarily the white h-pawn. That accounts for all 6 missing white pieces.



The balance is closed. No other captures are possible in the retroplay.

b1 = Since all of the captures by the white a-pawn were on dark squares, the black light-square bishop is on the board. The only light-square button is b1.

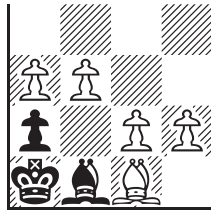
a1 = b8 ≠ If b8 = Impossible check by a7.


b8 =

One piece captured by the black a-pawn was a light-square bishop, so White has a dark-square bishop on the board.


c1 ≠  If c1 = 

There is an impossible cluster in the lower left corner. Try as you might, you can't get the pieces into this position.

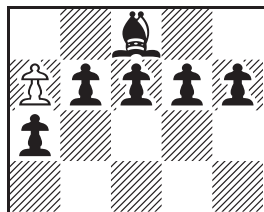


d8 = 

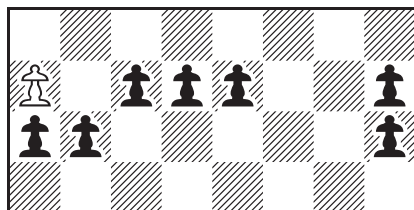
Only other dark-square button.

a8 ≠ 

The black pawn on b6 did not advance from b7 until after the white pawn captured on a7. At that point, the black a-pawn was on a6 and the black bishop was still on c8. That means the black rook that started on a8 never escaped the corner. Thus, it was the piece captured on a7. It also means that the black c-pawn was still on c7. Otherwise the black bishop could not escape. So, at the moment the rook was taken, the corner looked like this:

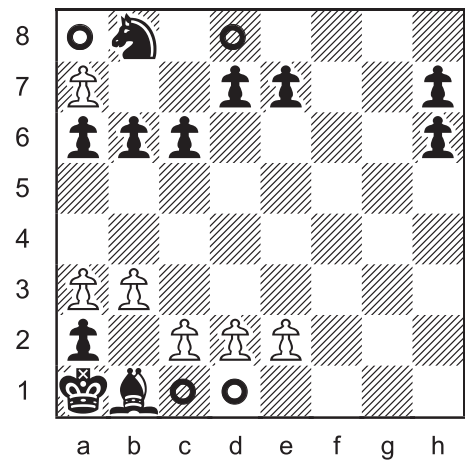


The white king had no way to reach a8 or b8 before this. Now Black must play ...b6 and bring the bishop out prior to playing ...c6. The position before ...c6 (and after ...gxh6) would look like this:



It is impossible for the white king to reach the 8th rank. And the advance ...c7-c6 will not open any doors for him.

a8 = 



Time now to consider the last moves.

Black played ...b6 and ...gxf6 long ago to let the bishops out from c8 and f8. Black played ...c6 earlier to let the white bishop reach d8. The last move was not ...Kb2-a1 because the king on b2 would either be next to the white king or in an impossible check by the white queen, depending on which piece is on c1.

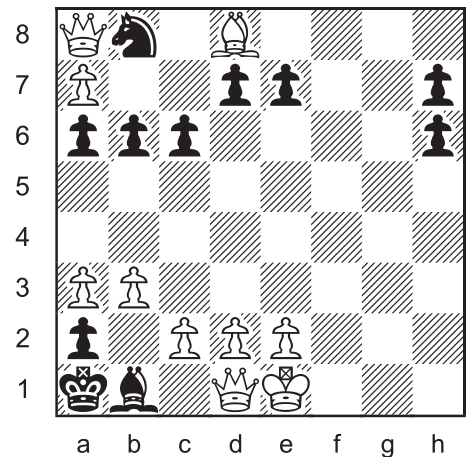
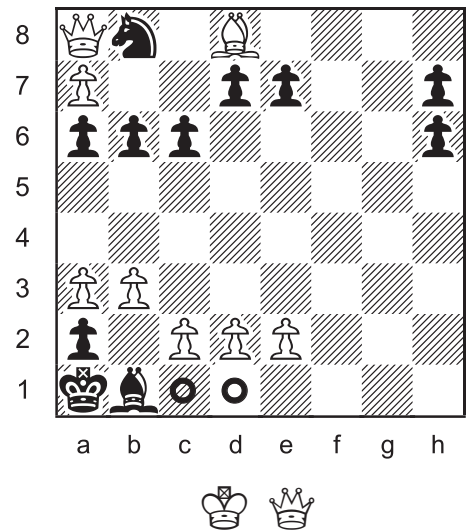
So the last move was by White. And it had to be a move that gives Black a legal move on the previous turn. That is only possible with the following piece assignment.

c1 = ♔

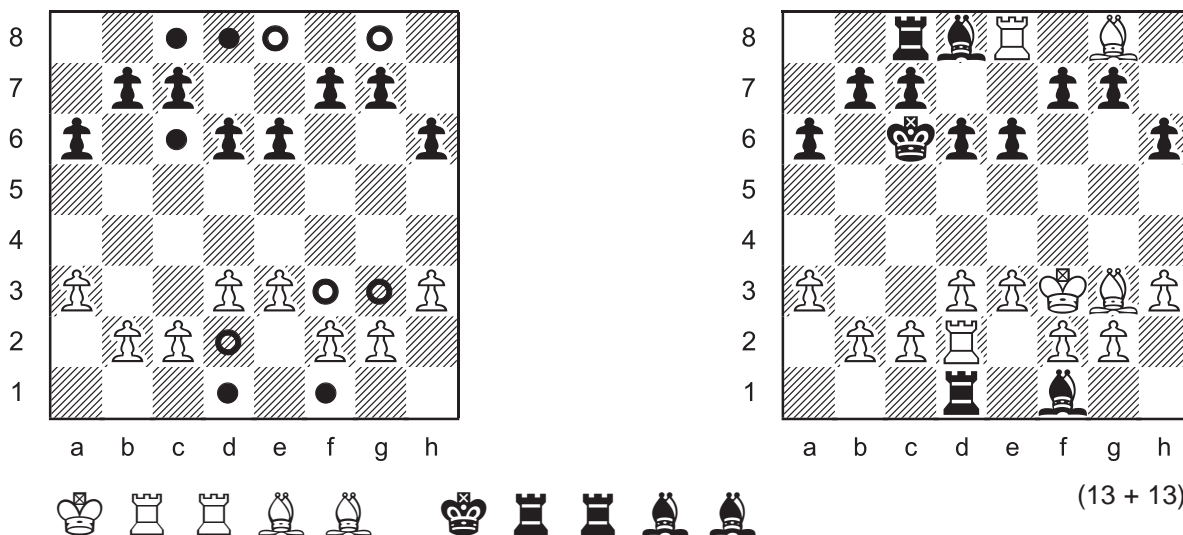
d1 = ♚

The previous moves, in reverse order, were:
 -1.Ke1-d1 Kb2-a1 -2.Qd1-c1+ Ka1-b2.

Or in forward notation from this diagram:
 1...Ka1-b2 2.Qd1-c1+ Kb2-a1 3.Ke1-d1.



Button Tops 07



Both sides have 8 pawns. There are no promoted pieces, so the bishops for each side must be on opposite-colour squares.

d8 = Only black button on a dark square.

(d1 f1) ≠ The black king cannot be on the 1st rank, inside the white wall of pawns.

At least one of the black pieces on d1 and f1 is a rook. The only way that a black rook could escape from behind the black pawns and reach the 1st rank is if there were cross-captures by both sides. White played dxe3 and exd3. Black played ...dxe6 and ...exd6.

RB exclusion. The cross-capture of pawns on d6 and e6 does not allow both black rooks and both black bishops to escape from behind the wall of pawns. Two bishops and one rook can escape. Or two rooks and one bishop can escape. But not all four. In the case where two rooks escape, one bishop was necessarily captured on its original square. The same principle applies to White and the cross-captures on d3 and e3.

One of the black pieces on d1 and f1 is a bishop. If both are rooks, then Black cannot have a light-square bishop on the board. The dark-square bishop on d8 is free to escape from behind the black wall. If both black rooks escaped, then Black's light-square bishop had to be captured earlier on c8.

c8 = Since both black bishops have escaped, one rook did not escape and must still be inside the wall of pawns.

c6 =

The assignment of white pieces is also based on RB exclusion.

$(e8\ g8) \neq \text{♔}$ The white king cannot be on the 8th rank, inside the black wall of pawns.

$d2 = \text{♖}$

White has 2 rooks and 2 bishops on the board. This is only possible if one white rook is still inside the wall of pawns.

$g3 = \text{♗}$ Only remaining white button on a dark square.

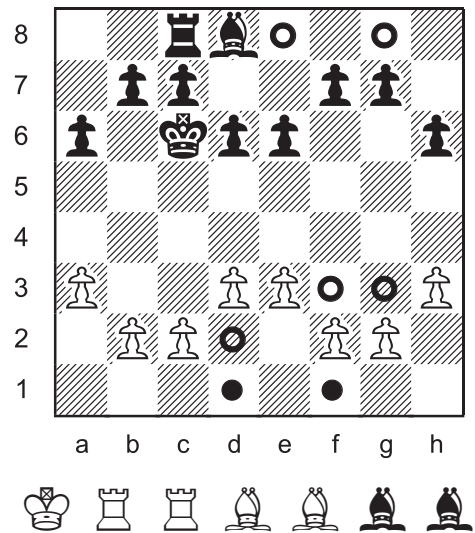
$f3 = \text{♘}$

$e8 = \text{♖}$ If $e8 = \text{♗}$ Impossible check.

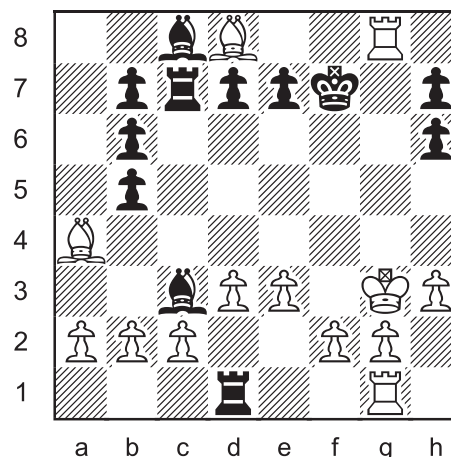
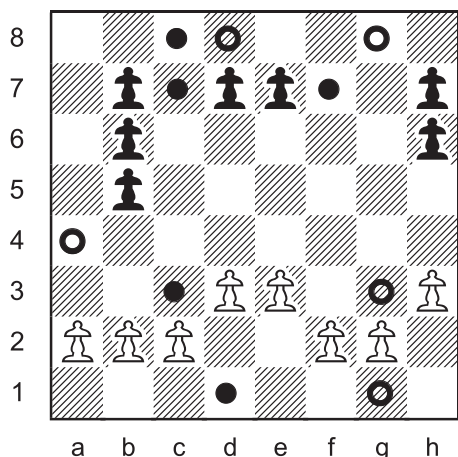
$g8 = \text{♗}$

$d1 = \text{♖}$ If $d1 = \text{♗}$ Impossible check.

$f1 = \text{♗}$



Button Tops 08



(13 + 12)



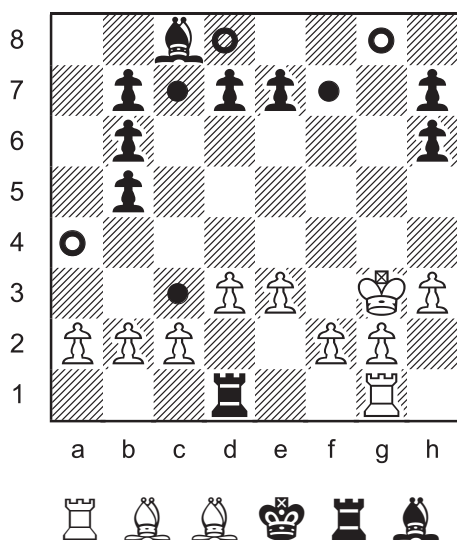
White has 8 pawns. Black has 7 pawns. The missing black pawn is from the f-file. The 3 missing white pieces (QNN) were captured by pawns on the b-file and h-file. No other captures by Black are possible, so the black f-pawn never promoted. There cannot be any promoted pieces, therefore the bishops for each side must be on opposite-colour squares.

- c8 = ♗** Otherwise the light-square bishop was captured on c8.
- d1 = ♜** $d1 \neq \text{♚}$ Black's king cannot be behind the white pawns.
- $d1 \neq \text{♗}$ Black cannot have two light-square bishops.

As in the previous problem, *RB exclusion* is a factor in determining piece assignment. At least one white rook escaped from behind the white pawns, so there was a cross-capture of pawns on d3 and e3. The only way that White can have two rooks and two bishops on the board is if one rook is still inside the wall.

- g1 = ♖** Only white button behind the white pawns.
- $(d8\ g8) \neq \text{♚}$ The white king cannot be on the 8th rank. The black pawns prevent him from even reaching the 6th rank.
- $a4 \neq \text{♚}$ If $a4 = \text{♚}$ Check by black pawn on b5.
- $g8 = \text{♗}$ Only remaining light-square button.
- $f7 \neq \text{♚}$ Impossible check by bishop (g8).
- $c3 \neq \text{♚}$ Impossible check by pawn (b2).
- $c7 \neq \text{♚}$ If $c7 = \text{♚}$
- $\text{♗} = (g3\ \text{or}\ d8)$ Both kings in check.
- $\text{♚} = \emptyset?$ No button can be the black king.



g3 = ♚





d8 =  Only remaining white button on a dark square.

f7 =  $c7 \neq$  Impossible check (d8).


$c3 \neq$  Impossible check (b2).

g8 =  $g8 \neq$  Impossible check (g8).

a4 = 

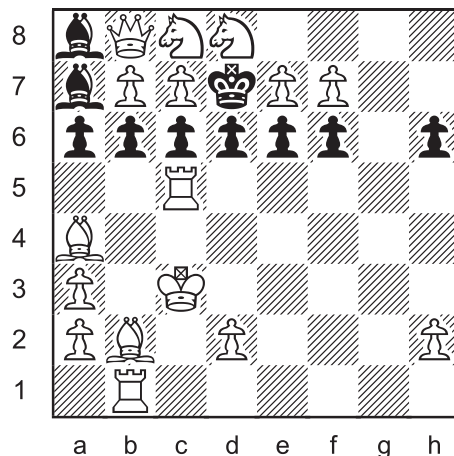
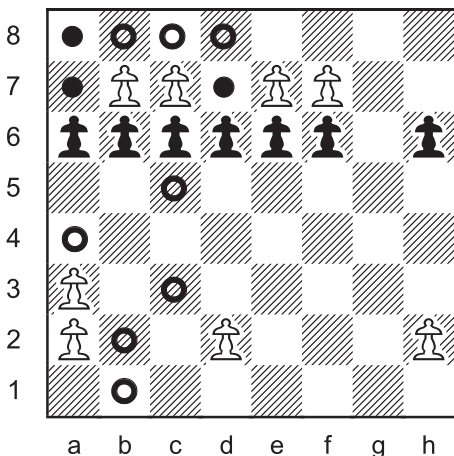
c7 =  $c7 \neq$  Impossible check (c7).

The last move could not be the capture ...Bb8xc7+ because all missing white pieces were taken by black pawns. No discovered check was possible either.

c3 = 



Button Tops 09



(16 + 10)



There are 16 white pieces on the board. So Black made no captures. The white pawn formation required 6 captures. That accounts for the 6 missing black pieces. No captures were made by white officers.

The black g-pawn could not be captured by a white pawn and was necessarily promoted to a piece on the dark square g1. It did not become a light-square bishop. Therefore Black can only have one light-square bishop.

d7 = ♖ a7 ≠ ♖ Two light-square bishops on a8 and d7.
 a8 ≠ ♖ Impossible check by the pawn on b7.

a7 a8 = ♜

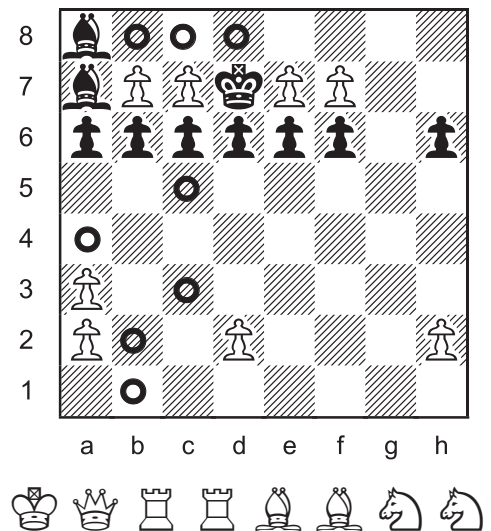
♔ = (a4 b1 b2 c3) (c8 d8) ≠ ♔ Adjacent to black king.
 b8 ≠ ♔ Impossible check (a7).
 c5 ≠ ♔ Impossible checks (b6 d6).



The next step in our investigation is to consider the moves that led to this position.

The black g-pawn is the key to unravelling the mystery. It must be on g7 before White retracts g6xf7. Otherwise the black g-pawn never promoted. And it did promote.

The h6-pawn is the only black piece with “reverse mobility”. It can retract once (to h7) before Black runs out of moves to retract, resulting in *retrostalemate* (an illegal position in which no last move is possible). For example, if b1 = ♔, -1.Kc1-b1? h7-h6 -2.Kd1-c1.



To avoid *retrostalemate*, White must recapture a piece. This must be done by a pawn, so the only option is b2xa3. However, before b2xa3 is retracted, the white dark-square bishop must return to c1. Otherwise the pawns at b2 and d2 would mean that the bishop was taken on c1 and is no longer on the board. And if the bishop is on c1, then a white rook must be on a1 or b1 because it could not escape the corner until after b2xa3. The only way to arrange the uncapture in time is with the following piece assignment.

b2 = ♗

b1 = ♖

a4 = ♗ c8 ≠ ♗ Impossible check.

The only remaining white button on a light square is a4.

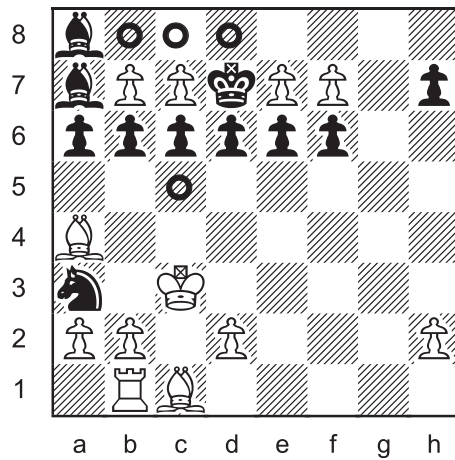
c3 = ♔

The last moves were -1.Bc1-b2 h7-h6 -2.b2xNa3.

For the position before these moves, see diagram next page.

The black piece captured on a3 had to be a knight. It was not a queen or rook because White would be in an impossible check. It was not a bishop because Black would not have a move on the previous turn. The bishop could not have moved from b4 because it would be checking the white king.

The position then unwinds with the black knight going to g1 where it unpromotes to a pawn. The pawn then backsteps to g7, allowing White to retract g6xf7. And so on.



In case you're more comfortable with forward notation, the moves from this diagram were 1.bxa3 h6 2.Bb2.

b8 ≠ ♘ Impossible check.

c5 ≠ ♘ Check. White would have to retract the knight and the uncapture on a3 could not happen in time.

c8 d8 = ♘

The white knights cannot retract until after the black g-pawn is back on g7 and White uncaptures g6xf7. At that point, the black pawn formation precludes the possibility of a white rook being on the 8th rank.

b8 = ♔

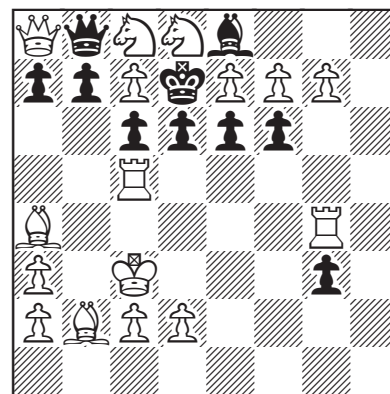
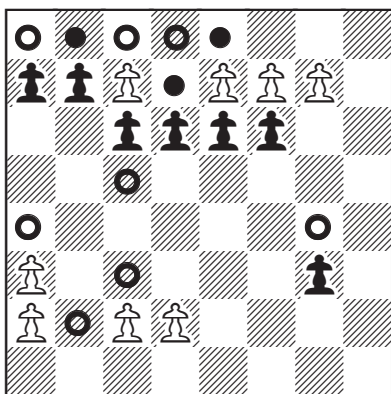
c5 = ♖



The Puzzling Side of Peace

Button Tops 09b

May 2021



(16 + 10)

These pieces are on the board:

In this version of the problem, added to the column in May 2021, Black has a bishop and a queen instead of two bishops. The last 8 moves are determined.

As before, the 6 missing black pieces were necessarily captured by white pawns.

The missing black h-pawn must unpromote on h1 and retract to h7 before White can release things with -h6xg7. Furthermore, White cannot recapture by -g6xf7 until the black g-pawn has retracted to g7.

d7 = b8 e8 ≠ Impossible pawn checks.

b8 = b8 ≠

A bishop could not retract from b8 until after -...d7-d6 and -d6xc7 are retracted. Before -...d7-d6 is retracted, the black light-square bishop must be on c8. In that case, it is impossible for a black rook to retract to a8.

e8 =

As in the original problem, White must recapture a promoted knight on a3 after retracting a bishop to c1. A white rook must also be on a1 or b1 before the recapture. While White arranges the recapture, Black can make three retractions with the g-pawn. The only piece assignment that allows this is:

g4 =

b2 =

a4 = c8 ≠ Impossible check on this light square.

c3 = a8 c5 ≠ Impossible check.

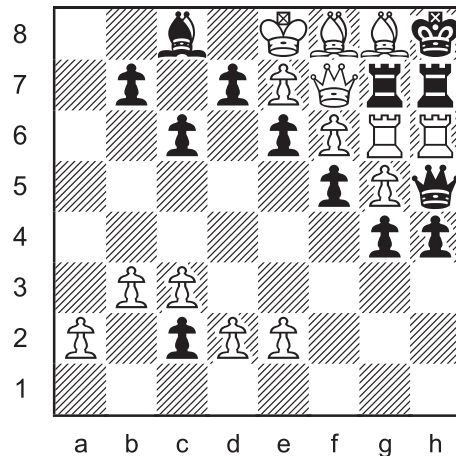
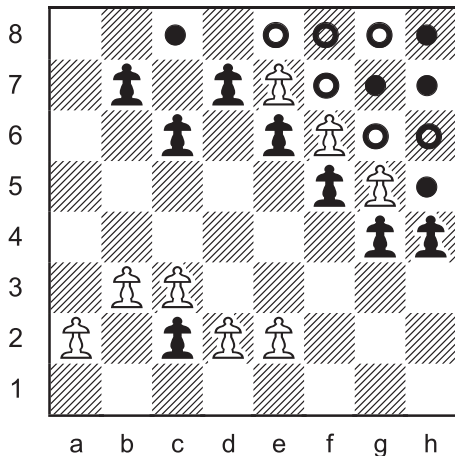
c5 = a8 c8 d8 ≠ After black pawns retract to g6 and h7, a white rook could not be on the 8th rank.

a8 = c8 d8 ≠ Impossible check.

c8 d8 =

Last moves: -1.Rb4-g4 g4-g3 -2.Bc1-b2 g5-g4 -3.Rb1-b4 g6-g5 -4.b2xNa3 Nc4-a3

Button Tops 10



(14 + 13)



Each side has 8 pawns, so there are no promoted pieces. The white bishops must be on opposite colours.

The 2 missing white pieces (NN) were captured by the black pawn on c2. The 3 missing black pieces (BNN) were captured by the white kingside pawns. No other captures in the retroplay are possible.

c8 = ♗ Otherwise the light-square bishop was captured on c8 and not by white pawns.

The other pieces must be assigned so that the overcrowded cage of pieces can be released. Note that b2-b3 cannot be retracted until after the white dark-square bishop returns to c1. That means that the only two pieces with “reverse mobility” are the black pawn on c6 and the white button on e8.

(f7 g6 g8 h6) ≠ ♔ Adjacent to black king or impossible check by black queen or rook.

f8 ≠ ♔ If f8 = ♔

g7 = ♖ g7 ≠ ♔ Adjacent to white king.

g7 ≠ ♔♗ Impossible check.

The cage cannot be released.

For example, if e8 = ♖ and f7 = ♔, Black has no previous move after the retractions -1.Rd8-e8 c7-c6 -2.Qe8-f7. The move -2...Rf7-g7 is impossible because the rook would be checking the white king from f7.

e8 = ♔ The two last moves were necessarily -1.Kd8-e8 c7-c6. The next diagram shows the position before these moves.

The only way to uncage the pieces is by clearing h5 and retracting ...h5-h4. Then White can recapture a knight or bishop by h4xg5.

But clearing the h5 square is not easy. The pieces must slide around one square at a time like in the famous "15 puzzle", often incorrectly attributed to Sam Loyd.

$g7 \neq \text{♔}$ Impossible check (f6).

$h7 \neq \text{♔}$ If $h7 = \text{♔}$
 $(g6 g8) \neq \text{♔♗}$ Impossible check.
 $g6 g8 = \text{♖}$

$f7 = \text{♗}$ Only remaining button on a light square.
 $h6 = \text{♗}$ $h6 \neq \text{♔}$ Impossible check.

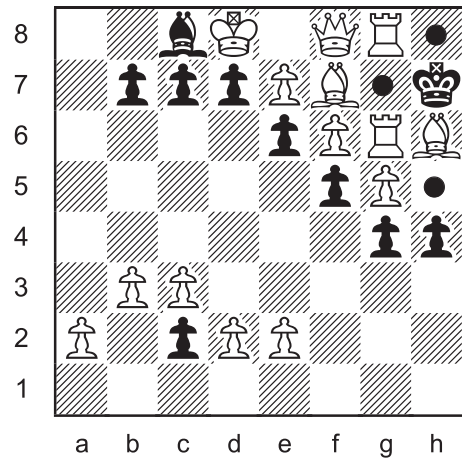
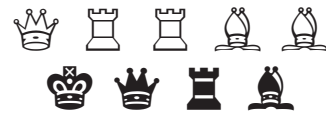
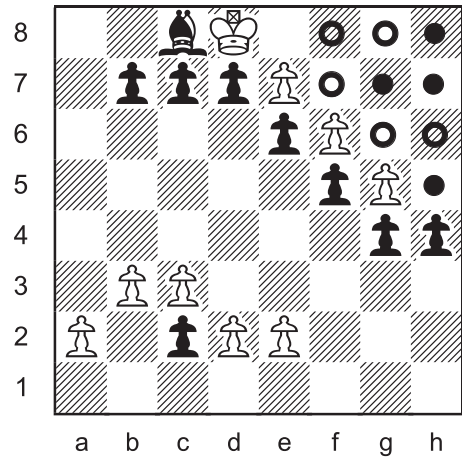
See diagram at right.

White can retract -2.Be8-f7 or -2.Qe8-f8.

If -2.Be8-f7, let's say $g7 = \text{♖}$ and $h5 = \text{♔}$.
 Then -2...Rf7-g7 -3.Bg7-h6 Qh6-h5 and
 White has no last move. Retrostalemate.

If -2.Qe8-f8, let's say $g7 = \text{♗}$ and $h5 = \text{♔}$.
 Then -2...Bf8-g7 -3.Bg7-h6 Qh6-h5 and
 again White has no last move.

Thus $h7 \neq \text{♔}$

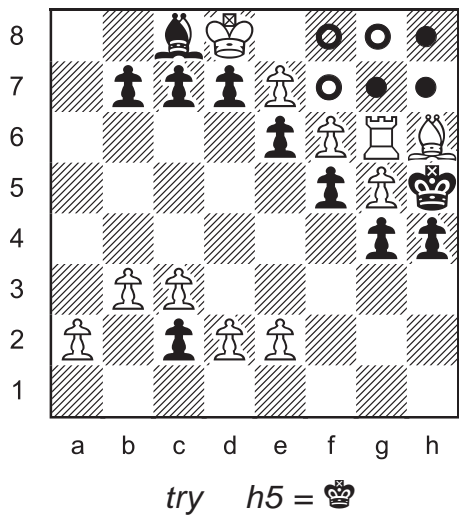


try $h7 = \text{♔}$



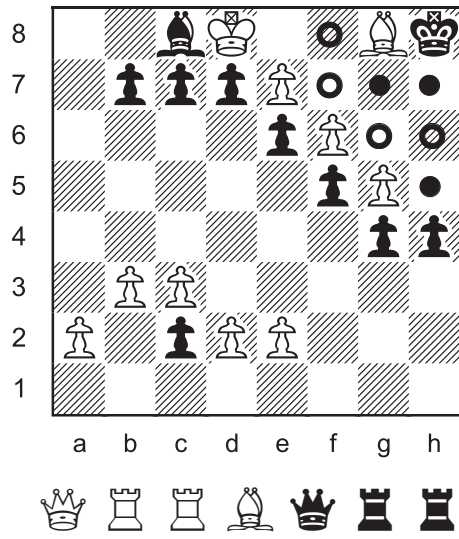
$h5 \neq \text{♔}$ If $h5 = \text{♔}$
 $g6 = \text{♖}$ $g6 \neq \text{♔} \text{♗}$
 Impossible check.
 $h6 = \text{♗}$ $h6 \neq \text{♔} \text{♖}$
 Impossible check.
 See diagram at right.

It is impossible for the black king to ever retract from h5. To do so, White would need to vacate g6 or h6 on the previous turn. If the black king then retracted to the vacant square, he would be in an impossible check by the white piece that just moved.



$h8 = \text{♔}$
 $g8 = \text{♗}$ $g8 \neq \text{♔} \text{♖}$ Impossible check.
 See diagram at right.

$h6 \neq \text{♗}$
 If $h6 = \text{♗}$
 The bishop can never retract to g7 because it would be checking the black king from g7. The only retraction from h5 would be to g6. The piece assignment would have to be $h5 = \text{♔}$ $g7$ $h7 = \text{♖}$ $f7 = \text{♔}$ $g6$ $f8 = \text{♖}$
 After the retractions -2.Qe8-f7 Rf7-g7
 -3.Rg7-g6 Qg6-h5, it's retrostalemate.



$f8 = \text{♗}$ Only remaining white button on a dark square.
 $f7 = \text{♔}$ Otherwise White's only retraction would be -2.Ke8-d8 with retrostalemate.

$g6$ $h6 = \text{♖}$
 White's previous move was -2.Qe8-f7, shown in the next diagram.



h5 ≠ ♖ The cage cannot be released.

If h5 = ♖ with g7 = ♖ and h7 = ♔
 -2...Rf7-g7 -3.Rg7-g6 Qg6-h7 -4.Bh7-g8+
 Retrostalemate.

If h5 = ♔ with g7 = ♔ and h7 = ♖
 -2...Qf7-g7 -3.Rg7-g6 Qg6-f7
 -4.Rf7-g7 Qg7-g6 -5.Rg6-h6 Qh6-g7
 (-5...Rh6-h7 or -5...Rh6-h5 retrostalemate)
 -6.Rg7-g6 Qg6-h6 Retrostalemate.

h5 = ♔
 g7 h7 = ♖

Complete diagram at right.

The release party continues on its merry
 way with -2...Rf7-g7 -3. Rg7-g6 Qg6-h5
 -4. Rh5-h6 Qh6-g6 -5.Rg6-g7.

Here Black has two options. Retracting
 -5...Rg7-h7 works but the shortest path
 to freedom is:

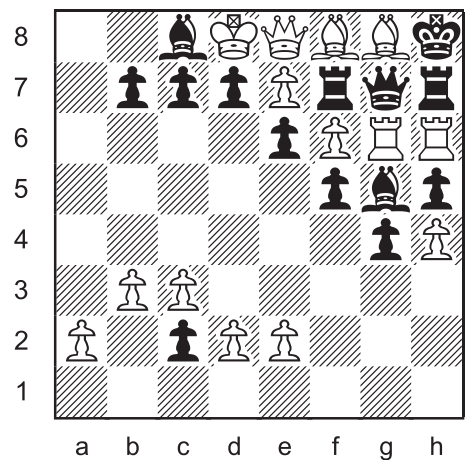
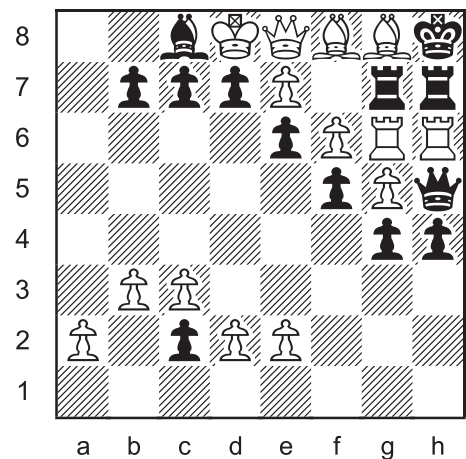
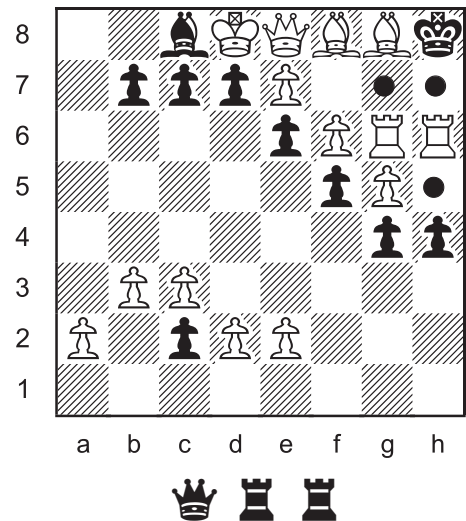
-5...Qg7-h6 -6.Rh6-h5 h5-h4 -7.h4xg5

The piece uncaptured on g5 can be a
 bishop or knight. The lower diagram
 shows the position before these moves
 with a bishop on g5.

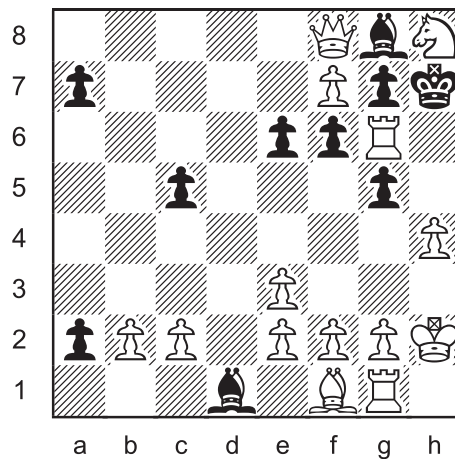
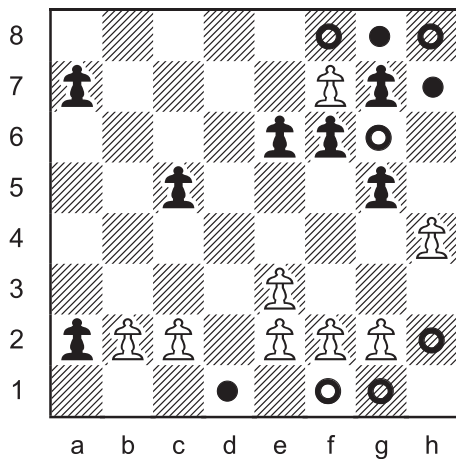
Forward play goes 1.hxg5 h4 2.Rh5 Qh6
 3.Rg7 Qg6 4.Rh6 Qh5 5.Rgg6 Rfg7
 6.Qf7 c6 7.Ke8.

The position in the diagram is still quite
 cagey. Full release is a long way away.
 One possible retroline is given below.

-7...Be3-g5 -8.Rg5-g6 Bc5-e3 -9.Rg6-h6 Qh6-g7 -10.Rg7-g6 Bb6-c5 -11.Rg6-g5 Qe3-h6
 -12.Rh6-g6 Qe4-e3 -13.Rg5-g7 Qe5-e4 -14.Rg6-h6 Qe4-e5 -15.Bh6-f8 Qe5-e4 -16.Rg7-g6 Qe4-e5
 -17.Rg6-g5 Rf8-f7 -18.Be3-h6 g5-g4 -19.Rh6-g6 g6-g5 -20.Rf7-g7 g7-g6 -21.Rg6-h6 Qe5-e4
 -22.Rg1-g6 Qe4-e5 -23.g5xNf6 Nd5-f6 -24.g4-g5 Qe5-e4 -25.Rf6-f7 Qe4-e5 -26.Rg6-f6 Qe5-e4
 -27.g3-g4 Rf6-f8 -28.Rg4-g6 Rg6-f6 -29.Rf4-g4 Rg4-g6 -30.Rf1-f4 Ra4-g4 -31.Qg6-e8 Ra8-a4
 -32.Qg4-g6 Nb4-d5 -33.Ke8-d8 Nc6-b4 -34.Kf7-e8 Nb8-c6 -35.Kg6-f7 Qd5-e5 -36.Kg5-g6 Qc6-d5
 -37.Kf4-g5 f6-f5 -38.Bf7-g8 Qd5-c6 -39.Bg6-f7 f7-f6 -40.f6xNe7 Kg8-h8 -41.Bc5-e3 Kf8-g8
 -42.Ra1-f1 Ke8-f8 -43.Ba3-c5 Ng8-e7 -44.Bc1-a3 Bc5-b6 -45.b2-b3 b3xNc2 -46.Be4-g6 a4xNb3
 -47.Bg2-e4 Bf8-c5 etc.



Button Tops 11



(14 + 10)



h7 = ♔ d1 ≠ ♔ Black king cannot be “inside the white box”.
 g8 ≠ ♔ Impossible check by the pawn on f7.

d1 g8 = ♖ The bishop on d1 is a promoted d-pawn.

The two missing white pieces (BN) were captured by black pawns on the a-file and g-file. The white a-pawn captured 5 times on light squares to reach f7. The other missing black piece, a dark-square bishop, was captured by the pawn on e3. That accounts for all missing pieces and captures.

f1 = ♗ The bishop could not have left f1 and it was not taken on f1 because the two missing white pieces were captured elsewhere by pawns.

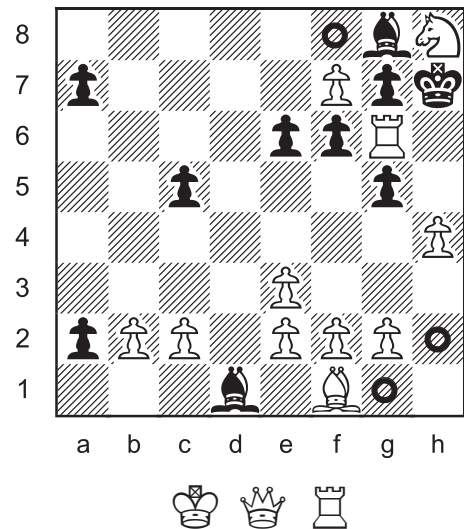
h8 = ♘ h8 ≠ ♔ Adjacent to black king.
 h8 ≠ ♔♖ Impossible check.

g6 = ♖ g6 ≠ ♔ Adjacent to black king.
 g6 ≠ ♔ Impossible check. It was not the capture Qxg6+ because all missing black pieces were taken by pawns.

So far, very easy. Now, as in problem 9, the remaining pieces must be assigned so that retrostalemate is avoided.

Black has lots of moves to retract. But everything hinges on a single tempo.

To release the pieces surrounding the black king, Black must retract ...e7-e6 to allow the uncapture e6xf7. However, before ...e7-e6 is retracted, the black dark-square bishop must be on f8. That bishop was captured on e3.



Here the retroplot thickens. Before d2xBc3 is taken back, the white dark-square bishop must be on c1. Otherwise the unmoved pawns on b2 and d2 would mean that the bishop was captured on c1 instead of by a black pawn. Additionally, if the white bishop is on c1 with a pawn on d2, then the white king and queen must also be inside the box on e1 and d1.

The strategy is clear. Black unpromotes on d1, retreats pawns, and uncaptures a bishop somewhere. White returns their officers (KQB) to the 1st rank (e1 d1 c1) and then uncaptures a bishop on e3. The only piece assignment that accomplishes the task in time is the following.

f8 = ♖

g1 = ♖

h2 = ♖ See diagram next page.



The first thing to note is that Black cannot retract ...h6xg5 until after a black rook is on h8. The rook was one of the pieces taken by the white f7-pawn. The uncapture of the rook cannot occur until there is a black bishop on f8 and a black pawn on e7. Afterwards, the h-file must still be open so the rook can retract to h8.

Therefore, the white dark-square bishop must be uncaptured by the black a2-pawn.

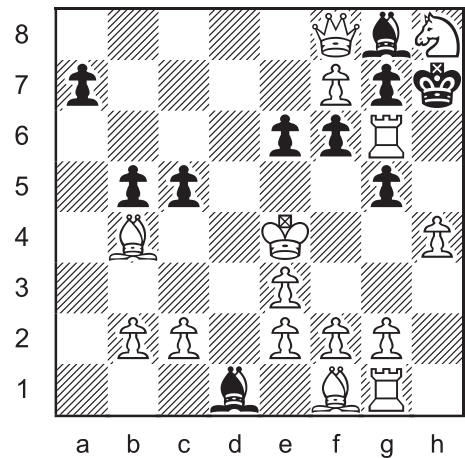
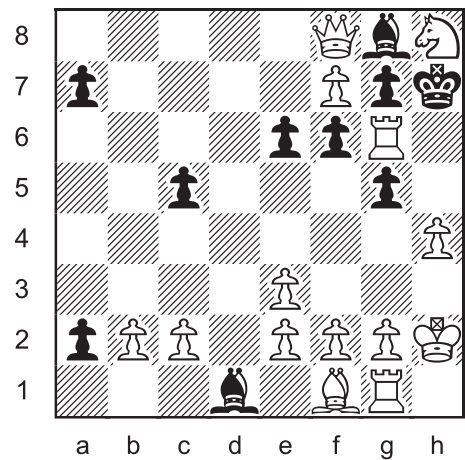
The white queen requires 2 moves to get from f8 to d1, but only if the black d-pawn is back on d7.

The white king requires 6 moves to get from h2 to e1, but only if the black d-pawn has retreated at least to d4. The king cannot go to e1 with the bishop still on d1 because then the unpromotion d2-d1=B would be impossible. The pawn would be checking from d2.

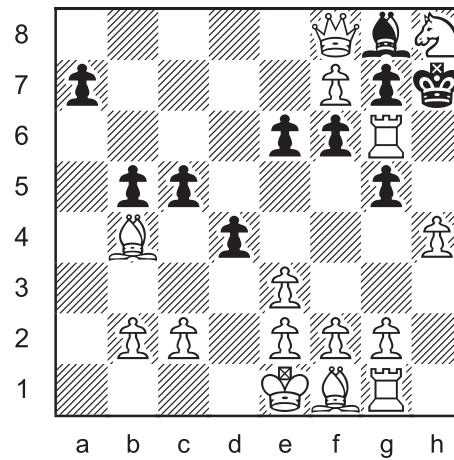
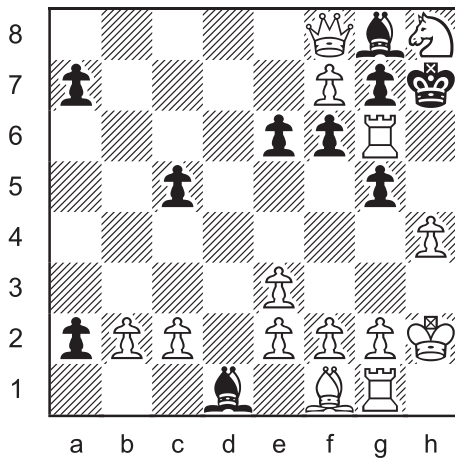
The soonest that Black can uncapture a dark-square bishop is by -1...a3-a2 and -2...b4xBa3, but then the retreat -3...b5-b4 is also necessary before the bishop can unmove to b4.

As it turns out, the correct approach is to first retract the king to d3 with the black pawn on d4 before the black a-pawn retreats. The diagram below shows what happens with the “a-pawn first plan”. The position is reached after -1.Kg3-h2 a3-a2? -2.Kf3-g3 b4xBa3 -3.Ke4-f3 b5-b4 -4.Bb4-a3.

Now the white king must wait too long before the black pawn gets to d4. For example, -4...c6-c5 -5.Bd2-b4 c7-c6 -6.Bc1-d2 d2-d1=B. White has no timely move to retract.

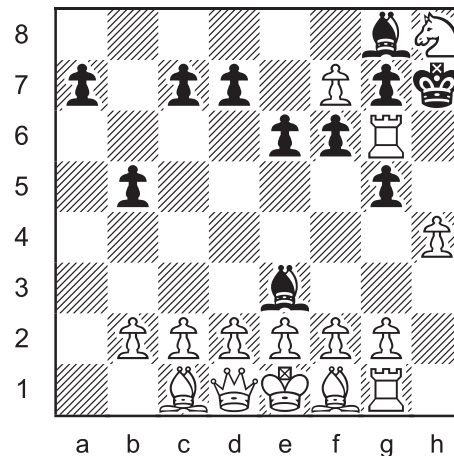
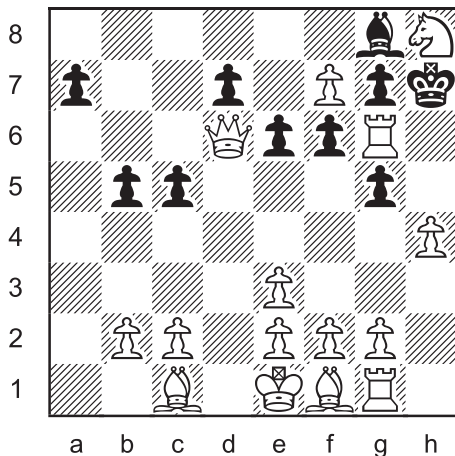


try with -1.Kg3-h2 a3-a2?



The efficient and true way to unproceed is -1.Kg3-h2 d2-d1=B
 -2.Kf3-g3 d3-d2 -3.Ke4-f3 d4-d3 -4.Kd3-e4 a3-a2 -5.Kd2-d3 b4xBa3
 -6.Ke1-d2 b5-b4 -7.Bb4-a3. Diagram on right.

Now Black must promptly unadvance the d-pawn to d7 to clear the d-file for the white queen. -7...d5-d4 -8.Bd2-b4 d6-d5 -9.Bc1-d2 d7-d6 -10.Qd6-f8. Lower diagram on left.



Black must still unmake two moves before the uncapture on e3. If the b-pawn retracts twice to b6 and b7, then a black bishop cannot get to c8. If the b-pawn goes to b6 and the c-pawn to c6, then a black rook cannot get to a8. So Black must retract the c-pawn twice to c6 and c7. -10...c6-c5 -11.Qd1-d6 c7-c6 -12.d2xBc3. Diagram at right.

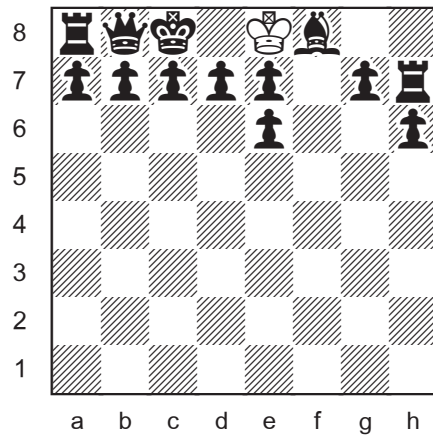
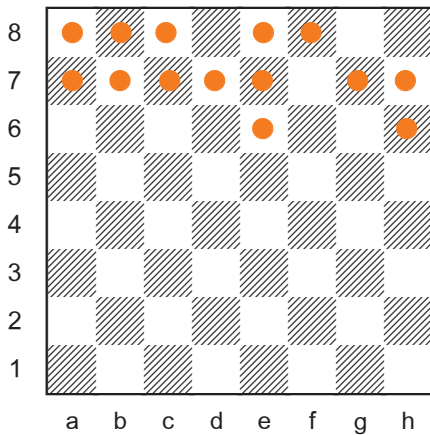
The forward play is 1.dxe3 c6 2.Qd6 c5 3.Qf8 d6 4.Bd2 d5 5.Bb4 d4
 6.Ba3 b4 7.Kd2 bxa3 8.Kd3 a2 9.Ke4 d3 10.Kf3 d2 11.Kg3 d1=B
 12.Kh2. A cool 23 exactly determined last moves.

The rebus version of this problem is given two pages ahead.

Colouring Buttons

Andrey Frolkin & Andrei Kornilov 1983

Multiplex



(1 + 13)

There are 9 buttons not on the 8th rank and there are 8 black pawns to add. So only one officer can be on the 6th or 7th rank.

a7 b7 c7 d7 e6 e7 = ♖ One of buttons on g7 h6 h7 must be an officer. Otherwise there is an impossible pawn formation.

h6 = ♖ If $h6 \neq \text{♖}$, then $g7 \ h7 = \text{♖}$
 ♖ \neq a8 b8 c8 e8 f8 On 8th rank behind black pawns.
 ♖ \neq h6 Impossible check (g7).
 ♖ = ∅? No button can be the white king.

g7 = ♖ If $g7 \neq \text{♖}$, then $h7 = \text{♖}$
 ♖ \neq a8 b8 c8 e8 f8 g7 The white king would be unable to reach any of these squares.
 ♖ = ∅? No button can be the white king.

With unmoved pawns on b7 d7 e7 g7, the black bishop is on c8 or f8.

f8 = ♖ c8 \neq ♖ Impossible for two pieces to be on a8 and b8. Only the rook that started on a8 could be in that box.

h7 = ♖ The black rook from h8 could not escape the corner.

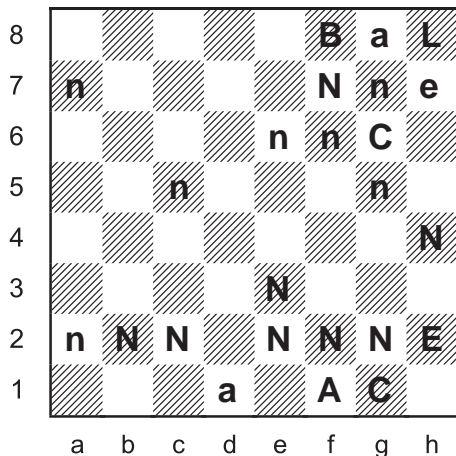
e8 = ♖ ♖ \neq a8 b8 c8 Impossible check by black queen or rook.

c8 = ♖ c8 \neq (♖ ♖) Impossible check.

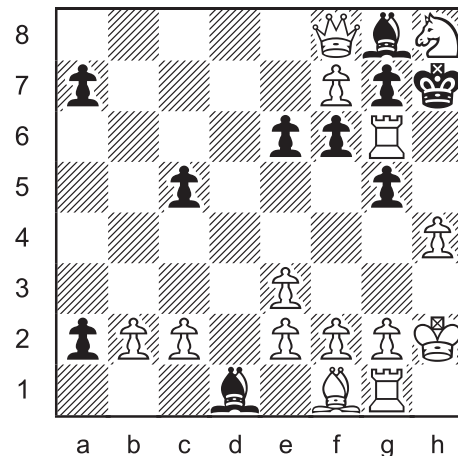
a8 = ♖ a8 \neq ♖ Impossible for the queen to reach a8.
 No way to get past the rook.

b8 = ♖

Rebus 65



“balance”
 B = queen
 A = bishop
 L = knight
 N = pawn
 C = rook
 E = king
 caps = white
 last move:
 1.Kg3-h2



(14 + 10)

E = ♔ Only letter with one uppercase, one lowercase.

N = ♟ Only remaining letter not on 1st or 8th rank.

caps = white The pawn formation with caps = black requires too many captures.

A = ♖ The two missing white pieces were captured by pawns on the a-file and g-file. White’s light-square bishop could not move from f1 with pawns on e2 and g2.

L = ♞ L ≠ ♔♖ Impossible check.

B = ♑ C ≠ ♔ White cannot have 2 queens and 8 pawns.

C = ♖

A very simple rebus to solve. The position is identical to Button Tops 11. The same exactly determined last 23 single moves.



We hope you enjoyed the puzzles.

© Jeff Coakley & Andrey Frolkin 2021. Drawings by Antoine Duff.
 Painting (page 1) by Nina Omelchuk. All rights reserved.