Alain Brobecker & the Retro Mailing List

Economy records in
"Add unit(s)" problems

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This small booklet is about chess problems showing an incomplete position and asking to **add units so that the position becomes (or remains) legal**. This kind of problem involves retrograde analysis, where the solver has to explore the past and legality of the game in order to answer the question.

We are interested in economy records, ie problems with as few units as possible on the diagram and forcing to add a given unit or problems forcing to add the highest possible number of units (also the cases of two units and of the smallest number of units are included).

If two positions share the same number of units, the preference goes to the one minimizing the number of officers (Q, R, B, N), then to the one minimizing the number of heavy officers (Q, R), then to the one minimizing the number of queens, then to the one minimizing the number of promoted pieces. If both positions are still similar, the one published first (or received first in my mailbox) will have the preference.

For problems forcing to add the highest possible number of units, a distinction has eben been made between diagrams with or without promoted units.

The problems are separated in two categories:

> ▷ The first contains problems in which the minimum number of units that can be added is also the maximum number of units that can be added and so this number need not to be specified ("add units", "add the missing unit(s)", "complete the position"). Such positions are always illegal (except the joke problem 0A).

> ▷ The second deals with problems in which there's a difference between this minimum and maximum. In such case the stipulation provides more information about the number of units to be added ("add N unit(s)", "add the minimum number of units"). Such positions can be legal (and will remain legal) or illegal (and will become legal after addition).

Moreover these categories are subdivided in the standard Type A or Type C categories of retro analysis, depending if a King is in check or not (see definitions on next page).

The table on page 2 summarizes the economy records as known to us for each of the categories. For example problem **N1QCi** is the economy record for an "Add one unit" problem in which the unit added will be a Queen, with illegal position and in which a King is in check. Problem **5A** is the economy record for an "add missing units" problem where the solver will have to place 5 units so that the position becomes legal and no King is in check.

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N	Add units (N) Type A illegal	Add units (N) Type C illegal	Add N units Type A illegal	Add N units Type A legal	Add N units Type C illegal	Add N units Type C legal
1=K	**1KA** (13)	**1KC** (12)	**N1KAi** (7)	impossible	**N1KCi** (3)	impossible
1=Q	**1QA** (14)		see 1QA	**N1QAl** (17)	**N1QCi** (10)	
1=R	**1RA** (13)		**N1RAi** (12)	**N1RAl** (14)	**N1RCi** (4)	
1=B	**1BA** (13)		see 1BA	**N1BAl** (12)	**N1BCi** (5)	
1=N	**1NA** (14)		see 1NA	**N1NAl** (17)	**N1NCi** (5)	
1=P	**1PA** (14)		see 1PA	**N1PAl** (13)	**N1PCi** (5)	
2	**2A** (13)		**N2Ai** (9)		**N2Ci** (5)	
3						
4						
5	**5A** (23)					
6	**6A** (22)	**6C** (20)				
7						
8						
9		**9C** (21)				
10						
11						
12		**12C** (18)				
13						
14						
15						
16			**N16Ai** (16)			
17						
18					**N18Ci** (14)	

Type A: It is not given who has the move, neither King is in check.
Type C: One King is in check (at least one King).
Type D: Duplex (one solution for White, one for Black).
Type DD: Duplex with similar solution.

The problems are sorted by number of pieces, so that the difficulty of solving increases slowly through the booklet. Experienced retroanalysts that are more appealed by complexity or beauty than by economy records will jump directly to problems **6C, 6A, 5A, I, II, VII**.

Some more problems were added at the end although they are not fitting in the above categories:
0A is the most economic joke problem, though not very interesting.
**N1RDDi** is an example of a DD Duplex problem.
I is a previous record holder for adding a bishop, and the problem at the origin of this booklet.
II is an illustration of a problem in which the number of units to add can vary.
III is an example of a problem in which the number of units to add can vary and those numbers are not contiguous.
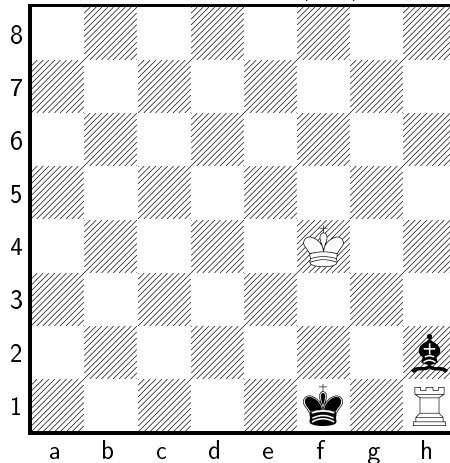**IV, V, VI, VII** are previous record holder.

N1KCi) Nikolai Beluhov
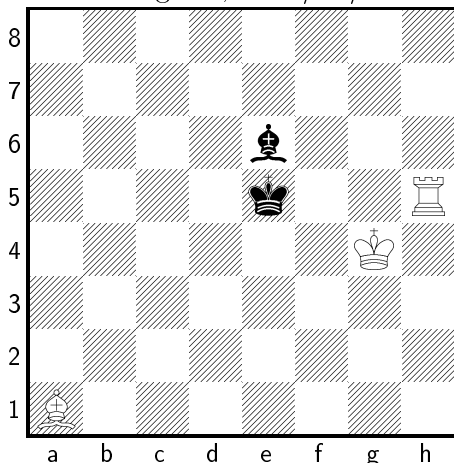Chess Problem Database, 2011/03/06
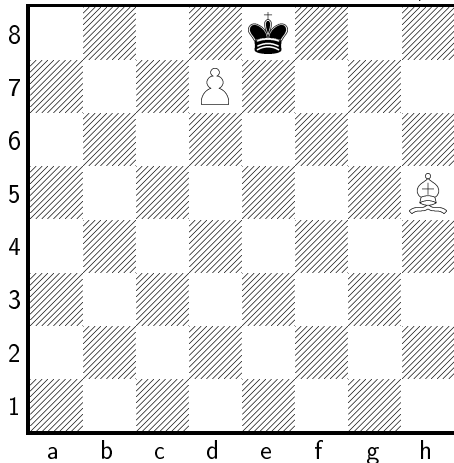
2+1: Add one unit.

N1RCi) Werner Keym
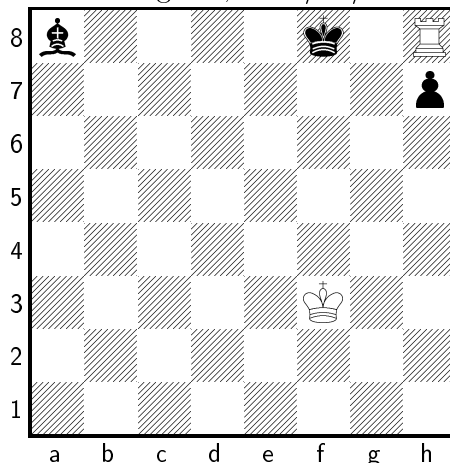Original, 2011/03/12

2+2: Add one unit.

N1NCi) Andrey Frolkin
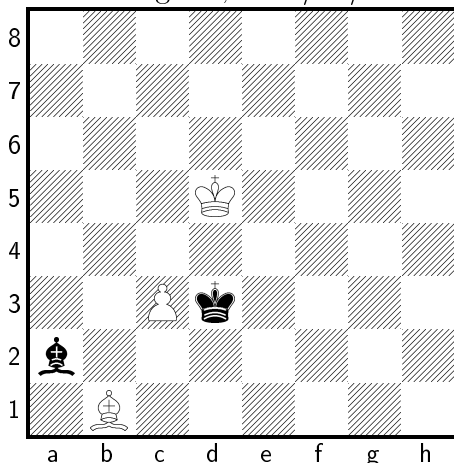(version by Beluhov, Angelini, Brobecker)
Original, 2011/03/10

3+2: Add one unit.
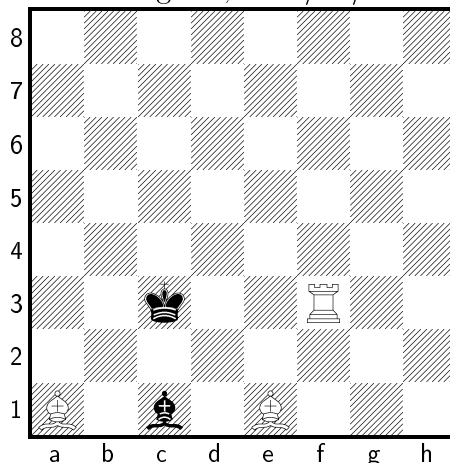
N1BCi) Andrew Buchanan
Original, 2011/03/20

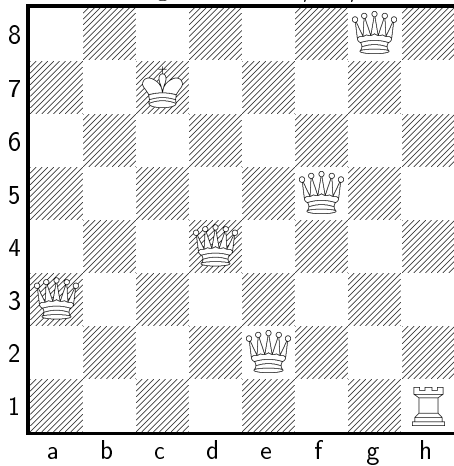2+3: Add one unit.

N1PCi) Andrew Buchanan
Original, 2011/06/07

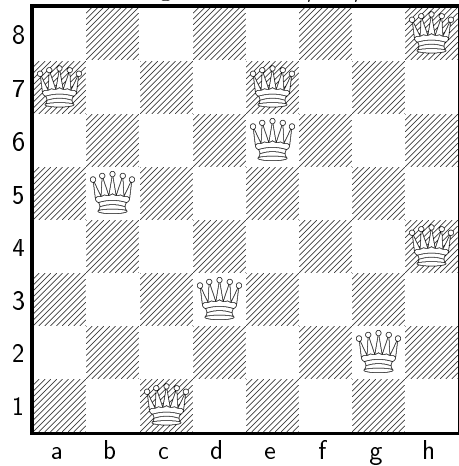3+2: Add one unit.

N2Ci) Andrew Buchanan
Original, 2011/06/01

3+2: Add 2 units.

N1KAi) Alain Brobecker & computer
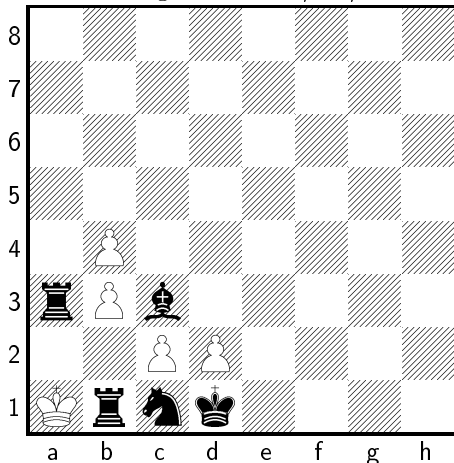(version by Werner Keym)
Original, 2011/03/13

7+0: Add one unit.

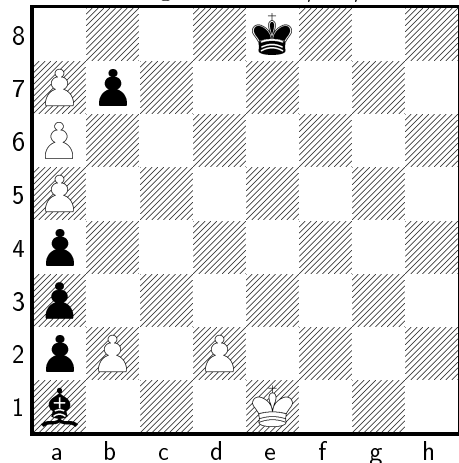**N2Ai) Alain Brobecker & computer**
Original, 2011/04/04

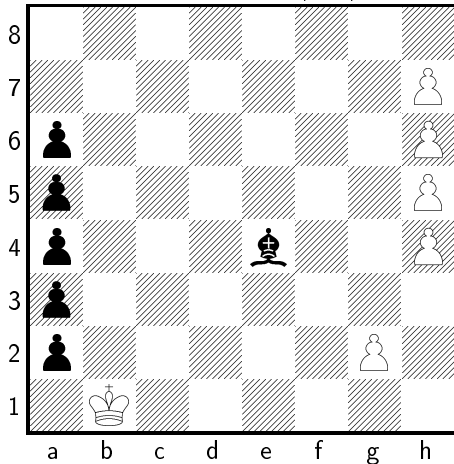9+0: Add 2 units.

N1QCi) Andrew Buchanan
Original, 2011/06/06

5+5: Add one unit.

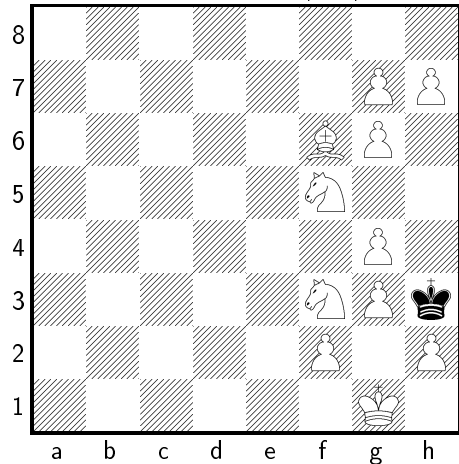**N1BAl) Andrew Buchanan**
Original, 2011/03/20

6+6: Add one unit.

1KC) Mu-Tsun Tsai
(version by Andrew Buchanan)
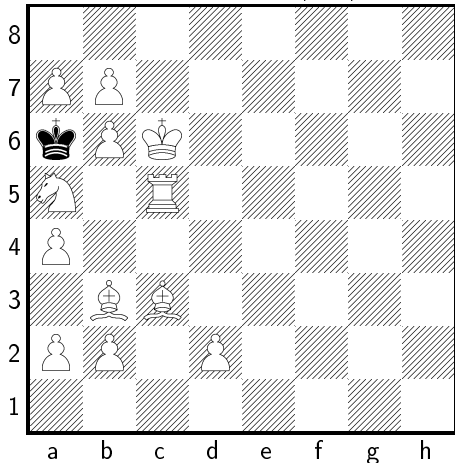Original, 2011/06/16

6+6: Add the missing unit(s).

N1RAi) Werner Keym
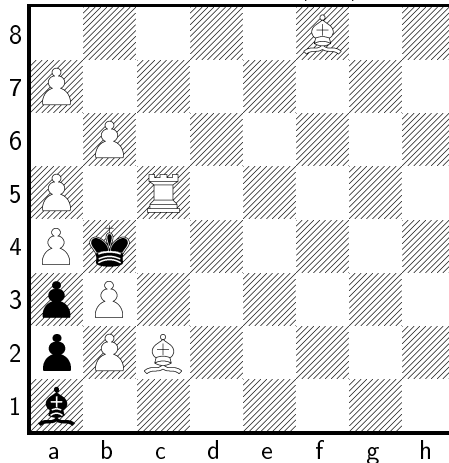Original, 2011/08/21

11+1: Add one unit.

2A) Michel Caillaud
Original, 2011/07/13

12+1: Add the missing unit(s).
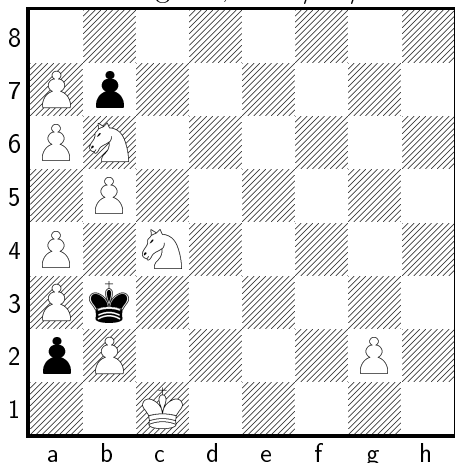
1KA) Michel Caillaud
Original, 2011/07/20

9+4: Add the missing unit(s).

1RA) Andrew Buchanan, Olli Heimo, Thierry Le Gleuher, Mu-Tsun Tsai
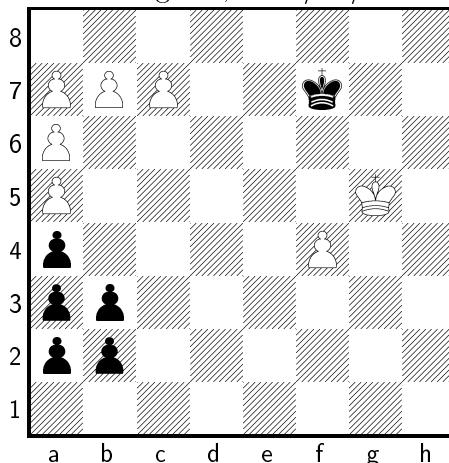### Original, 2011/06/20

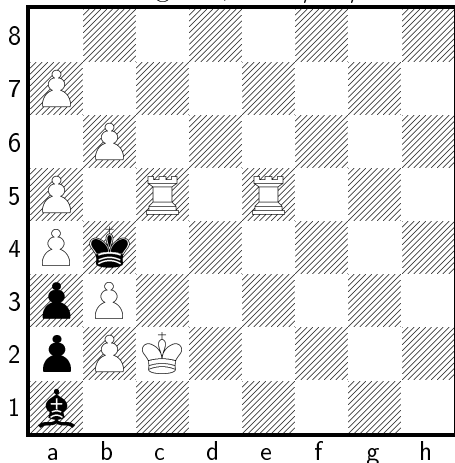10+3: Add the missing unit(s).

N1PAl) Andrew Buchanan
Original, 2011/03/20

7+6: Add one unit.
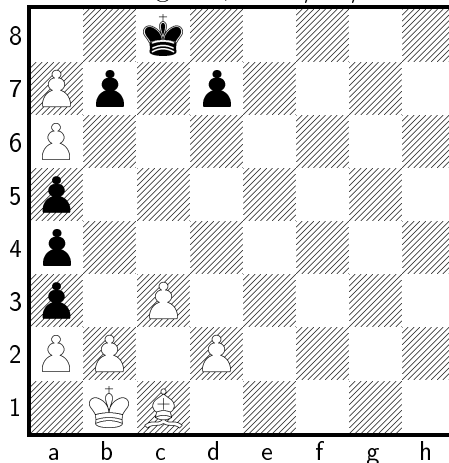
1BA) Michel Caillaud
Original, 2011/07/20

9+4: Add the missing unit(s).

N1RAl) Andrew Buchanan
Original, 2011/04/14

8+6: Add one unit.

6

**1QA) Andrew Buchanan,
Michel Caillaud,
Mu-Tsun Tsai, Dream Yeh**
Original, 2011/07/14
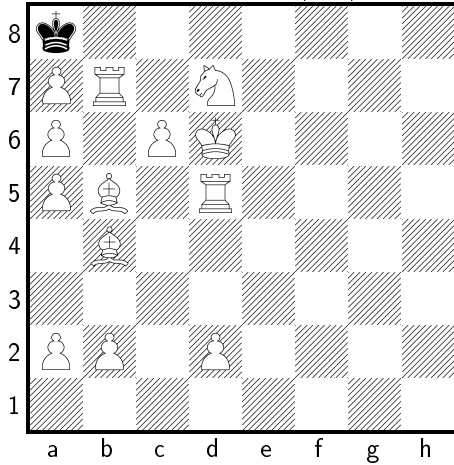
13+1: Add the missing unit(s).

**1NA) Andrew Buchanan,
Michel Caillaud**
Original, 2011/07/21
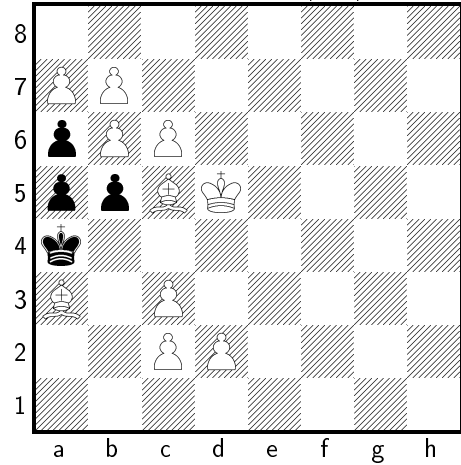
10+4: Add the missing unit(s).

**1PA) Andrew Buchanan,
Mu-Tsun Tsai**
Original, 2011/07/06
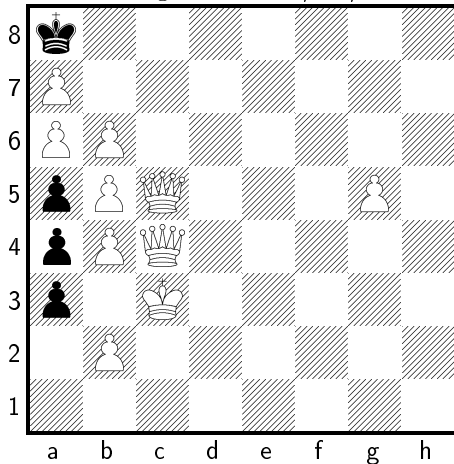
10+4: Add the missing unit(s).

N18Ci) Andrew Buchanan
Original, 2011/07/23
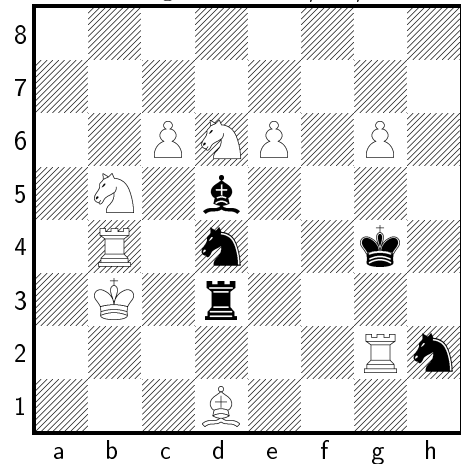
9+5: Add 18 units.

N16Ai) Thierry Le Gleuher
Original, 2011/03/24
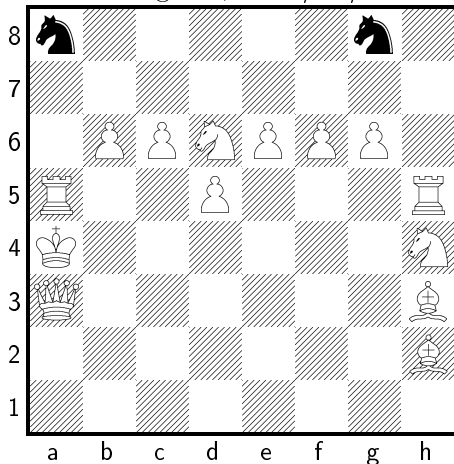
14+2: Add 16 units.

N1QAl) Werner Keym
(after **Thierry Le Gleuher**)
Original, 2011/03/21
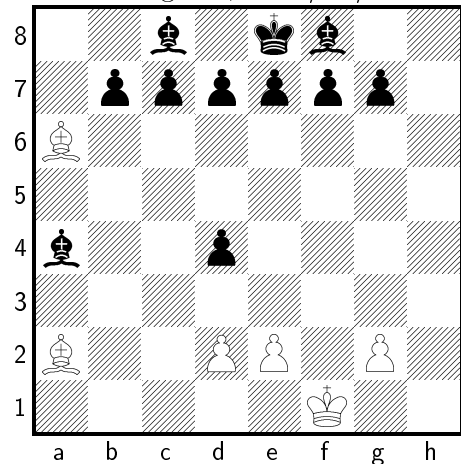
6+11: Add one unit.

N1NAl) Thierry Le Gleuher
Original, 2011/04/10
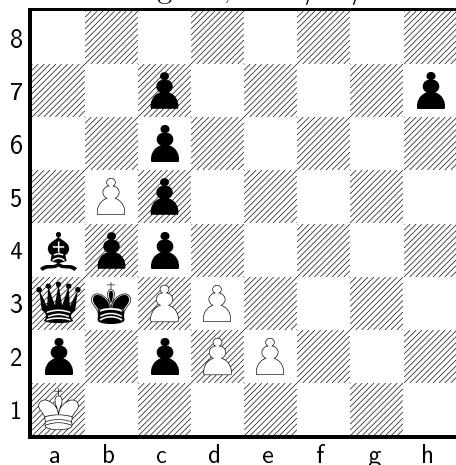
6+11: Add one unit.

12C) Thierry Le Gleuher
Original, 2011/05/15
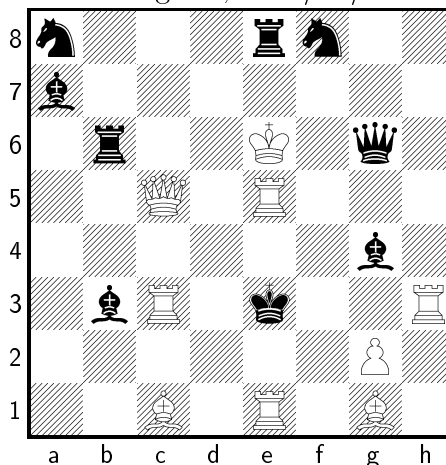
9+9: Add the missing unit(s).

6C) Dmitrij Baibikov
Shakhmatnaja Kompozitsija, 2006, 2nd Prize
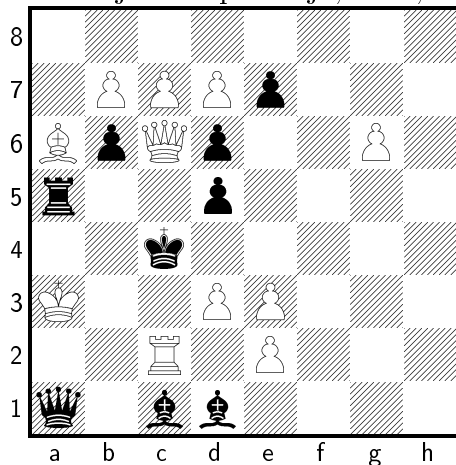
11+9: Add the missing unit(s).

9C) Michel Caillaud
Jubilé Le Gleuher 50, 2010, 2nd comm. (v)
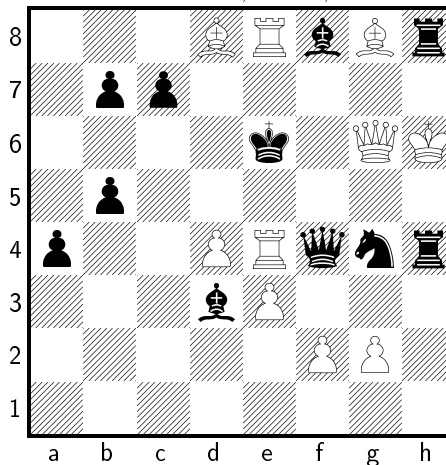
10+11: Add the missing unit(s).

6A) Michel Caillaud
Original, 2011/07/12
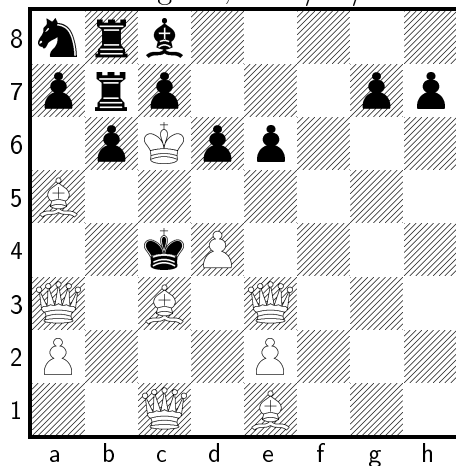
10+12: Add the missing unit(s).

5A) Thierry Le Gleuher
Original, 2011/03/12
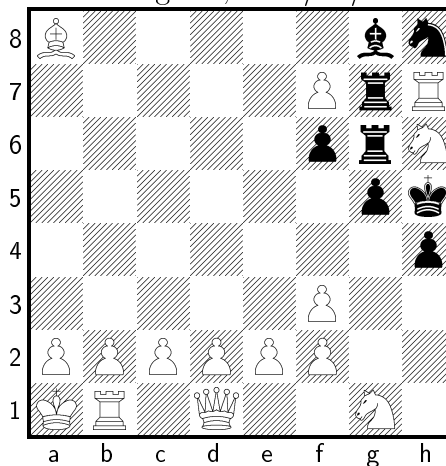
15+8: Add the missing unit(s).

8

N1RDDi) Werner Keym
Original, 2011/03/15
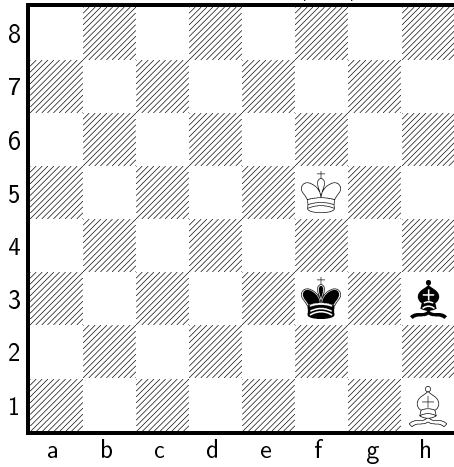
2+2: (a) Add one white unit.
(b) Add one black unit.

0A) Andrey Frolkin
Original, 2011/03/12
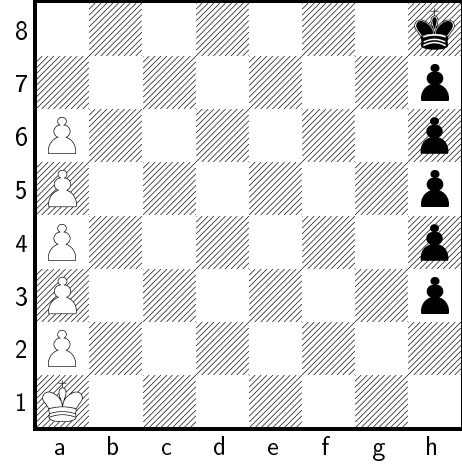
6+6: Add the missing unit(s).

I) Henrik Juel
Thema Danicum n°86, 1997, 2nd Prize
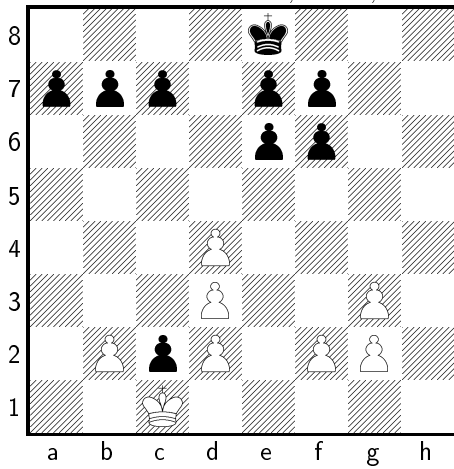
8+9: Add one unit. Last move?

II) Nikolai Beluhov
Jubilé Le Gleuher 50, 2010, 2nd HM
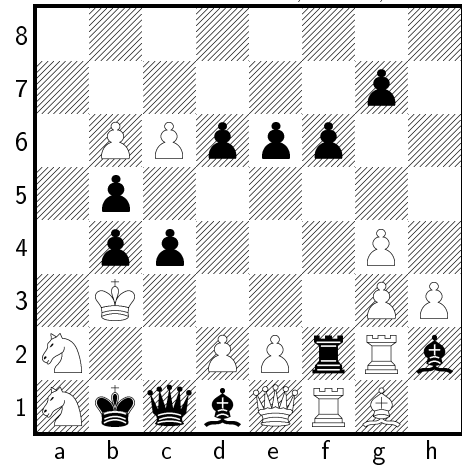
14+12: (a) Add one unit.
(b) Add two units.

III) Thierry Le Gleuher
Original, 2011/03/20
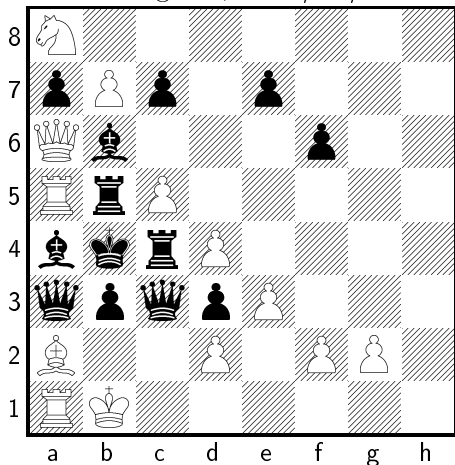
13+13: Add units (not zero).

IV) Andrey Frolkin
Original, 2011/03/18
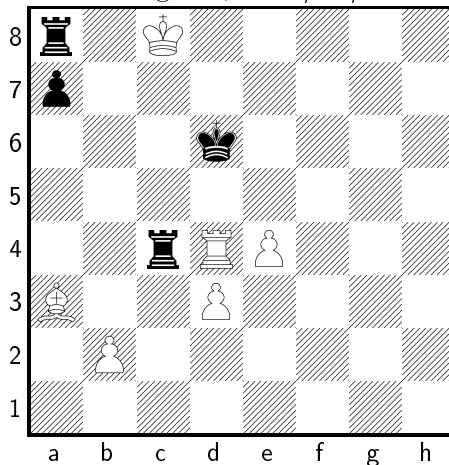
6+4: Add 2 units.

V) Mu-Tsun Tsai
Original, 2011/05/31
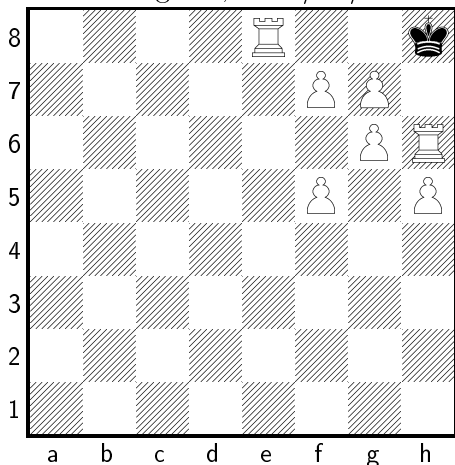
7+1: Add 2 units.

VI) Werner Keym
(after **Andrey Frolkin**)
Original, 2011/03/20
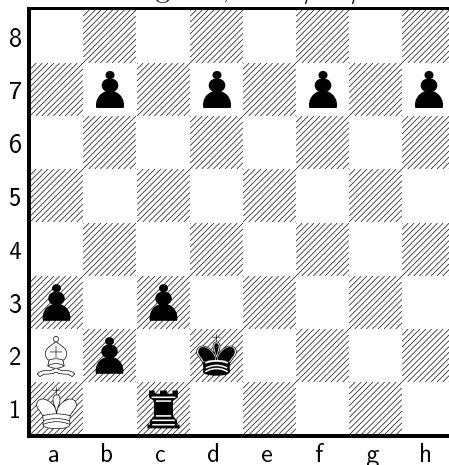
2+9: Add one unit.

VII) Dmitrij Baibikov
Shakhmatnaja Kompozitsija, 2005, 1st Prize
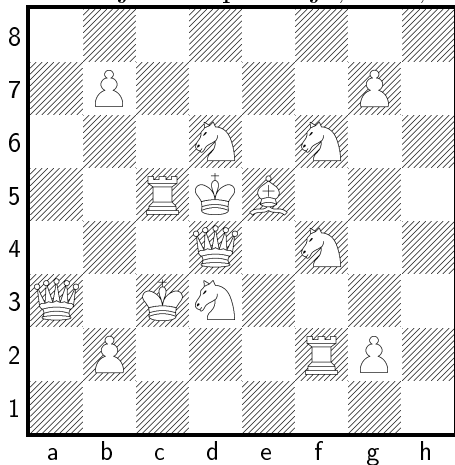
15+0: Color the units and add 17 units.

Solutions

N1KCi) +WKg6.

N1QCi) +WQa2.

N1RCi) +BRg1, last move n... Rg3x?g1
Ex-aequo problems:
Andrey Frolkin, Chess Problem Database, 2011/03/06.
6r1/8/8/4k3/8/8/7B/B5K1, 3+2: Add one unit.
Andrey Frolkin (version by Éric Angelini), Original, 2011/03/10.
8/8/8/4k3/7b/8/7B/B3K3, 3+2: Add one unit.

N1BCi) +BBd5, last move n...Bg8x?d5+
Ex-aequo problems:
Werner Keym, Original, 2011/03/12.
8/8/8/8/7B/8/K6r/4k2R, 3+2: Add one unit.
Nikolai Beluhov (after Andrey Frolkin), Original, 2011/03/08.
5k1R/r6K/8/8/8/8/8/5R2, 3+2: Add one unit.

N1NCi) +WNf5, last move n.Nd4x?f5+
Ex-aequo problem:
Andrey Frolkin (version by Nikolai Beluhov), Original 2011/03/08.
5r2/8/8/4k2R/8/8/8/B4K2, 3+2: Add one unit.

N1PCi) +BPc2, last move n.Pb3x?c2+
Ex-aequo problems:
Nikolai Beluhov (after Andrey Frolkin), Original, 2011/03/09.
1KR5/B7/3b4/2k5/8/8/8/8, 3+2: Add one unit.
Andrey Frolkin, Chess Problem Database, 2011/03/06.
6r1/8/8/4k3/8/8/7B/B5K1, 3+2: Add one unit.

N1KAi) +BKh6, other squares attacked twice and no square is unguarded before a promotion.
Previous records: Alain Brobecker, Original, 2011/03/13
7Q/8/3Q4/5Q2/2Q5/4Q3/6K1/Q7, 7+0: Add one unit.
Noam Elkies, Original, 2011/03/12.
5Q2/6Q1/7Q/4K3/Q7/2Q5/1Q6/3Q4, 8+0: Add one unit.

N1QAl) +BQd8, WBishops were promoted on g8 (4 captures), BBishop on b1/d1 (6 captures), BPd4 (3 captures).
If you put the WKf1 to h1 or elsewhere, you will receive a problem of the Type D. Add one a) white, b) black unit. Solution a) +WBf1, b) BQd8.
Source is Thierry Le Gleuher, Original, 2011/03/16.
2b1kb2/1pppppp1/8/2p3B1/5B2/8/1P1PP1P1/2b2K2, 7+11: Add one unit.

N1RAl) +WRa1, WPs have captured 9 B pieces and BPs have captured 6 W pieces. Since BBc8 has been captured home this means the piece to add is white. Also in the g and h files, both BPs and one WP must have promoted to be captured, this leads to the capture of the remaining WP on those files by a BP. Since WRa1 can't have been captured by a P, it's the only piece that can be added and it is on a1.

N1RAi) +WRf1. WPs have captured all missing B pieces. The only way to give retro play to B is to add WRf1 and last move was o-o.

N1BAl) +WBc1, BPs made 9 captures so we had 8 captures or more by WPs, with WPaxbxa. All f,g,h-file WPs must have promoted to be captured so two B units more were captured to let them promote (eg WPfxBPg and WPg promote on g8, BPh captured and WPh promotes on h8...). So we must add a W unit, and only the WBc1 is possible to add.

N1NAl) +BNb1. bPs captured 10 times (all the white missing pieces). So wPs captured 4 times and there is one black unit can be uncaptured freely. White retro move b2xXc3 or c4xXb5 is not possible.
The position is legal : Retro : 1... d7xRc6 2.Rh6-c6 d5xNc4 3.Nb2-c4 d6xQc5 4.Rh1-h6 e7xRd6 5.Rb1-h1 e6xNd5 6.Rh1xNb1 f7xBe6 7.Nc4-b2 Qc1-a3 8.Rh6-h1 Ka3-b3 ... or 1... d7xRc6 2.Rg6-c6 d5xNc4 3.Rg8-g7 d6xQc5 4.g6-g7=R e7xRd6 5.h6xXg7 ... Rh1xNb1 ...
The cage can be opened only by uncapturing a black unit on b1. If we add 1 piece (black), the precedent retro play is not possible any more. It's necessary to add the black piece on b1. Not a new Bishop on white square! solution : + bNb1.
retro : 1... d7xRc6 2.Rh6-c6 Qc1-a3 3.Rh5-h6 Ka3-b3 ...

N1PAl) +BPf5, BPs have made 8 captures or more, WPs have made 9 captures (including WPaxbxa). But Ps on g-h-files must have promoted with only one capture (eg WPgxBPh and WPh promote on h8, BPg promotes on g1...), so BPf has not promoted or captured and si the only piece available.

N2Ci) +WKe3, +WRd2

N2Ai) All squares are controlled at least twice! Double check by promotion to queen by n.g7x?h8=Q doesn't work, BK would be on g8 where there's not enough room for the WK to parry attack by WQe6, or on h7 which is too much controlled. So we must put BK on a square controlled only twice and add WK in order to parry one check. The squares that are controlled only twice are a5,d1,f3,f4,f7,f8 and h2. But only f4 allows enough room for WK to parry the second check, so +WKd2 +BKf4.
One of the many ex-aequo problem: Alain Brobecker & computer, Original 2011/04/04, 4Q3/2Q5/7Q/Q3Q3/4Q3/1Q6/6Q1/5Q2 has the maximum of 11 squares that are controlled twice, but the BK is on the edge.

N18Ci) 5b2/2ppp1p1/1pPNP1P1/pN1b3p/PRrn2kP/1KQr1pq1/1P1P1PRn/2BB4. All pieces will be on board so pawns remain on their original file. +BPc7,d7,e7,g7 and +WPd2. This entails +BBf8. Since BBd5 is out we must have +BPb6 +WPb2 and this entails +WBc1. WKb3 is attacked by WNd4, so we need 4 units on the lines to the Ks and one of those lines is blocked by P, so +BPf3 +WPf2. Since all Rs must be out, we have +WPa4,h4 +BPa5,h5. Last the remaining line interceptions are +BRc4 +WQc3 +BQg3.

N16Ai) nrbqkbnr/1ppppppp/pPPNPPPP/R2P3R/K6N/Q6B/P6B/8. Last moves are n-1... a7-a6 n.N?d6+.

1KC) +BKd3, BPs have captured 10 W pieces and WPs have captured 9 B pieces. So we can only add the BK and it must shield WK from illegal check by the BBe4.

6C) Black is in check definitively and without discovery from WPd3. So there must be 6 units blocking the other potential checks. Next, as usual, we count the pawns captures. BgP captured WhP and then promoted, as then did BhP. BfP must have promoted on f1, and so WfPxe3 happened

earlier. All other captures are accounted for.

So we just need to figure out which the six blocking pieces must be. It seems likely that each King is protected by a piece of its own colour, since otherwise the piece is difficult to retract. But which pieces could it be? White is constrained to RBNN, but Black has had three promotions, so anything is possible.

The first observation is that the retro-knot is an amazingly tight one, considering that the six blockers have some degree of latitude, and that there is a big hole in the knot in b3/b4. None of the other pieces on the board can move, except for BQ wandering to b1 (and possibly unpromoting from a2), and WPg6, suspiciously posted on this specific rank, suggesting a clock. And if a blocker unmoves, it must immediately be replaced by a piece from the other side.

With BQ on b1 or as a pawn on a2, a unit will be released for other duties. This unit, if Black, could retract to f1 or h1 but there is no way through the jam. Alternatively then, this unit might replace a unit on c3, which could travel to f1. So we try WNa2 & BNc3 (BR or BQ on c3 gives impossible check, while BB could not reach f1 or h1, because the square is the wrong tint.)

So we try 0.d2-d3+ Ne4-c3 -1.Nc3-a2+ Qb1-a1+ -2.g5-g6 Ng3-e4 -3.g4-g5 Nf1-g3 -4.g3-g4 f2-f1=N -5.g2-g3. Oops we can't block WB from returning to its home. We need an extra tempo move for White.

There is a sequence WNb4-a2 BQb1-a1+ WNa2-b4 which will do the job, and get the queen out of the way without taking up a key move later on. But what Black move is legitimate before this?

We now need to consider the other 4 blocking units. Is there some clever cycle that some of them could move in to lose a tempo? Changing the guard between 2n squares would take 2n+1 moves. For example (if forget about blockers themselves checking for a moment) we might imagine WBa4 & BQb5. These could retract BQb4-b5 WBb5-a4+ BQa4-b4+.

But avoiding checks is a big constraint, and although knights are generally good at this, they cannot change parity so are useless if n=1. So checking all the (four) possible pairs of squares in turn, there is no way to cycle the blockers pairwise. So n=2, and we are looking at 5 moves to change the guards across all four squares a4, b2, b5 & c5. There are two possible orders for the moves. One is c5, a4, b5, b2, the other is the reverse. But the reverse would involve a WN on b2, which is not possible. Given the order of the squares, the piece identities are determined uniquely by the need to avoid checks.

So when the pieces have been placed on the board, it looks like this:
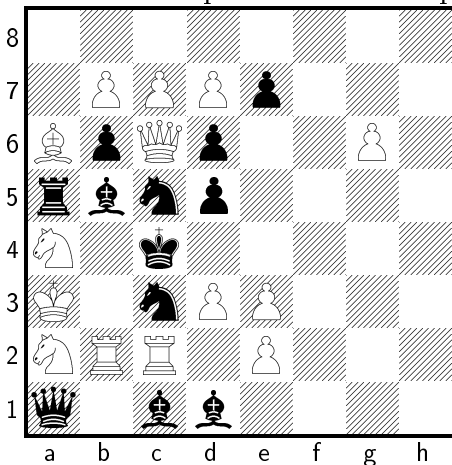
We are now ready to retract the moves: 0.d2-d3 Nd3-c5 -1.Nc5-a4+ Ba4-b5+ -2.Rb5-b2+ Nb2-d3+ -3.Nb4-a2 Qb1-a1 -4.Na2-b4 Ne4-c3 -5.Nc3-a2+ Ng3-e4 -6.g5-g6 Nf1-g3 -7.g4-g5 f2-f1=N -8.g3-g4 f3-f2 & -9.fx?e3 unlocks the position. I think the last 18 moves are unique. What a masterpiece! (Andrew Buchanan)

9C)+WNe7, WNf7, WPa4, WPh5, BNg7, BPe5, BPf6, BPg5, BPh7.
Source is Michel Caillaud, Jubilé Le Gleuher 50, 2010, 2nd comm.
3BRbBr/1pp5/4k1QK/p7/3pRqnr/1P2P3/2PP1PP1/1b6, 12+11: Add the missing units.

BNg4 gives check. We must then add 8 units on e5,e7,f6,f7,g5,g7,h5,h7 to avoid an illegal check. Two white units were captured by BPd7xc6xb5. The last missing unit is the WPa which couldn't change file. No other capture being possible (hence no pawn crossing neither promotion) the 8 units intercepting the checks are easily known: 5 pawns which couldn't change file and 3 knights. No pawn crossing on the h-file so we have WPh5, BPh7. BPg7? would give illegal check to WK, hence BPg5. BPf7? then the WBg8 would be illegal, so BPf6. BPe7? then the WBd8 would be illegal, so BPe5. WNg7 would give illegal check to BK, hence BNg7, WNe7, WNf7. When retracting Nh2-g4+, we must consider the last white move. It must be done by the last missing unit, the WPa that we must then add to the position. Last moves: -1.Nh2-g4+ a2-a3!

The idea was to have the maximum units to add in a position without visible promotion, here 9. With promoted riders (R,B,Q) we shall be able to add more, but it doesn't interest me (=Michel Caillaud)...

12C) Black knight at f8 is checking the white king, so all the other attacks needs to be blocked, that will require adding at least 12 units. At least four pieces are promoted pieces, so at least two captures need to be made and thus no more units can be added. All the 12 units need to be added within the cdefg files, so the six pawns from abh files are missing. The original h pawns can't make any captures (otherwise the two sides can't promote bishops on different color squares), so the original h7 pawn must be captured on h file to allow the original h2 pawn to promote to bishop, and the original b2 pawn captures the original a7 pawn, allowing the original b7 pawn to promote to bishop, while the other two white pawns promote to rooks. Since all the other pawns didn't make captures, white pawns can't be on d2, e2 (locks the original f1 bishop), f2, and white has another bishop on light square, the solution is: n3rn2/b3p3/1rp1Kpq1/2Q1RP2/2PpP1b1/1bRPk1pR/3NBNP1/2B1R1B1

1KA) +WKe7. Wk is missing. WPs have captured all missing B pieces. BPs on diagram and promoted BB implies 5 captures of W pieces. Also both BPs g and h have promoted to be captured, so one WP was captured. So only the WK can be added, and it must be added on e7 to give retro play to B: n-1.R?-?+ Kc5-b4 n.R?-c5

1QA) +WQc7. WPs have captured all missing B pieces. WBc1 has not left its home, so WPh promoted without capturing and is now WBb4. So BPh captured once to promote and be captured. +WBc1? is not possible since it forbids WRa1 to escape. So at most one W piece can be added. We must give retro play to black: n.b6xR/N/Pa7? leads to retro stalemate. So +WQc7 (+WNc7? would give illegal check) and the last moves are n-1... Q/Bb8-a7 n.b6xQ/Ba7.

1RA) +WRd1. WPs have captured all missing B pieces. BPs have captured all missing W pieces (BPgxh so that both BPg and BPh can promote and be captured and also two captures to have BPa2). With no uncapture possible on diagram, the only way to give retro play to B is to add WRd1 and last move was o-o-o.

The authors pointed afterward the similarity with the following problem:
Oskar E. Vinje, Fairy Chess Review, 1938
8/P1p5/PN6/1P6/P1N5/Pk6/pP6/2KR4, 10+3: Last single move?

1BA) +WBd5. WPs have captured all missing B pieces. BPs on diagram and promoted BB implies 5 captures of W pieces. Also both BPs g and h have promoted to be captured, so one WP was captured. So only one W piece can be added, and to give retro play to B we must add a WB on d5. Last moves: n-1.R?-c?+ Kc5-b4 n.Rc?-c5

1NA) +WNb4. WPs have captured all missing B pieces. BPs have captured 4 W pieces (they must go round WPa). Also BPh has promoted to be captured, thus there is another capture by B: either BPhxg either WPh on its file. So only one W piece can be added and the only way to give retro play to B is by adding WNb4 with last moves being: n-1.Ba1-b2+ Ka3-a4 n.Bb2-a3

Ex-aequo problem:

Michel Caillaud, Original, 2011/07/19.

8/PP6/2R5/kPP5/ppPN4/p2K4/1PP5/8, 10+4: Add the missing unit(s).

Andrew Buchanan & Mu-Tsun Tsai, Original, 2011/06/18.

8/PP6/1PB5/2N5/P7/PRK5/kP1P4/2QR4, 13+1: Add the missing unit(s).

1PA) +BPg6. White has definitely made 11 pawn captures moving West, leaving only one capture unaccounted for. So the WaP did not capture twice to avoid BaP. Therefore it must have been BaP which captured twice. So 5 Black pawn captures in this area, leaving one White capture unaccounted for.

If the Black piece is really absent from the board, then White's last move must have been to uncapture it.

- if we add a White officer on the board to uncapture some Black unit, then neither WgP nor WhP could have captured. But there are no spare captures to enable one of BgP & BhP to promote, and we know that one of them did. So contradiction.

- if the capture was by an existing officer, then all 3 of WhP, BgP & BhP must have promoted, but there is only one missing piece (W) to enable this. So contradiction.

- if the capture was hxg5, then prior to this BhP must have captured the hitherto-unexplained White piece to promote or be on g5. WgP already promoted without capture, so BgP was already missing. But BgP could not have captured. So contradiction.

Otherwise, we must add a Black unit to the board. Then WhP promoted without capture, and BhP must have captured to get out of the way. It could then promote and head to the slaughter of the Western front. So BgP could never have captured, and this must be the additional piece, on g6 to allow the Black unmove.

2A) +WRb4 +WNb5. WPs have captured all missing B pieces. We had BPhxg promoted to be captured and WPh promoted to WBc3 without capturing. To give retro play we must add WRb4 (thus adding WBc1 is not possible) and WNb5 with last moves being n-1...N?-c4+ Ka5-a6 n.Nc4-a5.

5A) +BPs a3, b3, c3, d3 and e3.

WBc1 taken home, so no BP captured or promoted and it's impossible to retract WPe6xf7. The only way to open the cage is to reorder white homebase and retract WPg2xf3, this takes 19 retro moves. Add all remaining BPs on third rank, and we can't retract both BPs on b7 and d7 to let the BBg8 get home, and we can't either retract BP to e7 since the BPg must retract to g7 in order to allow uncapture of dark squared BB by WPf7.

6bn/ppp1pPrR/3p1prN/6pk/7p/5P2/PPPPPP2/R2QKBN1

1.Nh3-g1 a4-a3 2.Qh1-d1 a5-a4 3.Rg1-b1 a6-a5 4.Bb7-a8 a7-a6 5.Bc8-b7 b4-b3 6.Kb1-a1 b5-b4 7.Kc1-b1 b6-b5 8.Kd1-c1 c4-c3 9.Ke1-d1 c5-c4 10.Kf1-e1 c6-c5 11.Kg2-f1 c7-c6 12.Ra1-g1 d4-d3 13.Qd1-h1 d5-d4 14.Kf1-g2 d6-d5 15.Ke1-f1 e4-e3 16.Ng1-h3 e5-e4 17.Bh3-c8 d7-d6 18.Bf1-h3 e6-e5 19.g2xQf3 Kg4-h5 20.Nf5-h6+

6A) +WRb1! +WRd2 +WBc2 +WNb3 +WNd3 +WPb4. 4 W pieces on the diagram are promoted and are from WPf (without capture), WPc and WPg (1 capture each) and a fourth WP which made 2 captures: either the WPb (passing round BPb) or the WPh (hxgxf). The 4 miising B pieces were then captured. What was last move for B?

f7xe6 is impossible since it closes the f-file and implies 2 more captures by WPf and WPg.

e7-e6 or e7xd6 is impossible since it removes BBf8 from B pieces captured by WPs and forbids the promoted WBs to g out of their promotion square.

The WK is retro-blocked and can not currently free the B pieces in the north cage.

So the BK has played last, and the only possible square is c3! To avoid the illegal checks we must

add pieces on b3, b4, c2, d3 and d2. To avoid checks on c3 or c4 we add WNs on b3 and d3 and a WR on d2. WPb4 and WBc2 are the only remaining possibilities once the Ns are used. Before n-1... Kc3-c4 n.B?-c3 the bishop was giving check and the only explanation is by adding WRb1 with n-1.Rb2-b1+ Kc3-c4 n.Ba1-c3.

N1RDDi) (a) +WRg4, last move n.Rg2x?g4+. (b) +BRg2, last move n... Rg4x?g2+.

0A) 20 captures by pawns, no unit is missing!

I) +BBf8. 7 units captured by BPs, WQB taken home, so it's a B unit to add. Also we know WPa had promoted, which makes 6 captures by WPs. WPe2xd3 before WKB goes out, so it has been captured on e6, and BQB+BQR have escaped afterward. Thus the last capture by BPs is of the promoted WPa and has occured on f6, so BKB got out afterward. But when trying with BBg7 or BBh6 we have a timing problem. So the previous play was:
n-11... d7xBe6 n-10.a2-a3 Bc8-d7 n-9.a3-a4 Bd7-c6 n-8.a4xNb5 Qd8-d4 n-7.b5xBc6 o-o-o n-6.c3xQd4 Rd8-d7 n-5.c6xRd7+ Kc8-b8 n-4.d7-d8=N Kb8-c8 n-3.Nd8-c6 Kc8-d7 n-2.Nc6-e5+ Kd7-d8 n-1.Ne5-g4 Kd8-e8 n.Ng4-f6+ g7xNf6

II) (a) Try: Add a bN or bR on c2. Retroplay: 1.c5-c4+ f3xPg4 2.h5xQg4 Qg6 3.h6 Qe8 4.h7 Qa8 (Qh4-d8-a8 is also possible) 5.f7 a7-a8Q 6.d7 a6 ... one move too late. Add a wR on c2. Retroplay: 1.c5-c4+ f3xNg4 2.Ne3 Rc4 3.Nc2+ Rh4 4.f7 Rh8xPh4 5.d7 Ra8 6.h5 a7-a8=R 7.h6 a6 8.h7 a5 9.a6xBb5 Kc4 ... (b) Add a wN on c2 and a bP on h4. Retroplay: 1.c5-c4+ f3xRg4 2.Rc4 Ne3 3.Rc2+ Nd5 4.f7 Nc7 5.d7 Na8 6.h5 a7-a8N 7.h6 a6 8.h7 a5 9.a6xBb5 Ka5 ...

III)+wBb2, +wNc2. Retro : 1.Kc1-b1 f7-f6 2.Bb1-a2 Qa2-a3 ... Initial position is legal : 1.e4xNd3 ...

IV) +WPc6, +WRb8, last moves n-1.Rb4-b8+ d7-d5 n.d5xe6+

V) +WKf8, +BBh7, the only possible piece that prevents retro-stalemate.

VI) +WQb1. Last move is n... b3-b2+, so the unit to add is on b1 and white to give retro play to white. Only a WQ will do (no WB promotion on light squares, a WN would give an illegal check to BK and a WR would retro-stalemate).
Source is Andrey Frolkin, Original, 2011/03/11.
8/p1p1p1p1/8/8/8/1k6/ppn5/BK1r4, 2+9: Add one unit.

VII) BPb7 and g7, WPb2 and g2, the latter entails WKc3, BKd5, BNf6 and f4 then WNd3 and d6. Qd4 attacks both Ks so Rc5 does not attack a K, so BRc5 and a unit on c4. +BPd7, +BBc8, +WPd2, +WBc1, so BBe5 and since there was no capture, WQd4 (if BQd4, before this attack the BBe5 would already attack WK) then BQa3. +BRe4 and last moves were n-1... BRd4-e4+ n.WQe3-d4+. So WRf2 and no unit on e3, this entails +BPe6, +WPe2, +WBf1, +WPf5, +BPf7 and +WRb3. To let the rooks out, we have +WPa4, +WPh4, +BPa5 and +BPh5. Last +BPc4 and +WPc2.

Index of Names

Fide titles for chess composition are: Fide Master (FM), International Master (IM) and International Great Master (IGM), but no title were given before 1972.

References are in bold for the author of an original problem or for an author who improved a problem ("improvement" according to our specific task), in italics when the contributor specified he only made a version of an existing problem or if the problem is ex-aequo and only available as FEN in the solutions.

Some informations regarding the problems are lacking and some errors may lie in the solutions (hopefully not in the problems). Also it's almost certain some records are missing in the list, or they may just have been broken by fellow retroanalysts.

In any case, don't hesitate to write in order to help maintain this list up to date:

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