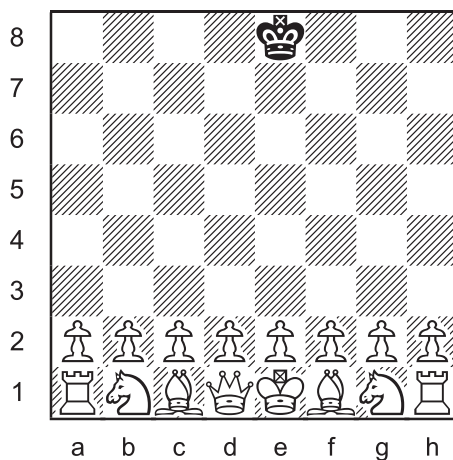## SIXTEEN PIECES: Part 2

number 39   June 29, 2013

This column presents five more puzzles using the sixteen white pieces.

In the first three problems, the sixteen pieces stand in the initial array. The objective is to mate a lone black king.

Sixteen Pieces 05

helpmate in 3

In a *helpmate*, Black moves first and cooperates with White to checkmate the black king. In other words, Black plays the worst moves possible in order to assist White. Did your opponent ever help you in a tournament game?
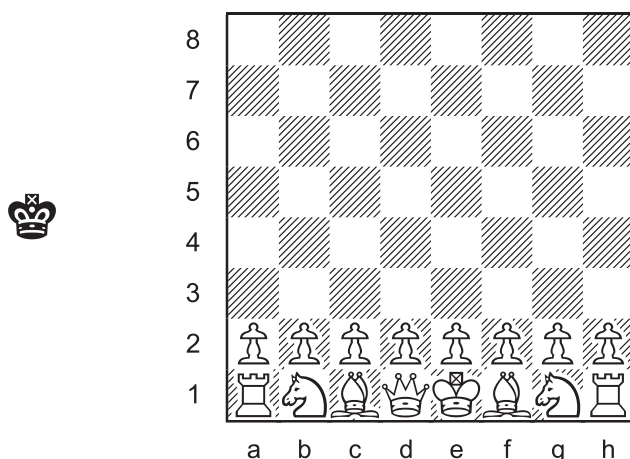
For those who are new to this kind of puzzle, this is what happens in a helpmate in three: Black moves, White moves, Black moves, White moves, Black moves, White mates.

For part 1 of *Sixteen Pieces*, see column 36.

In the next two diagrams, there is no black king. Your task is to place him on the board to achieve the stipulated goal.

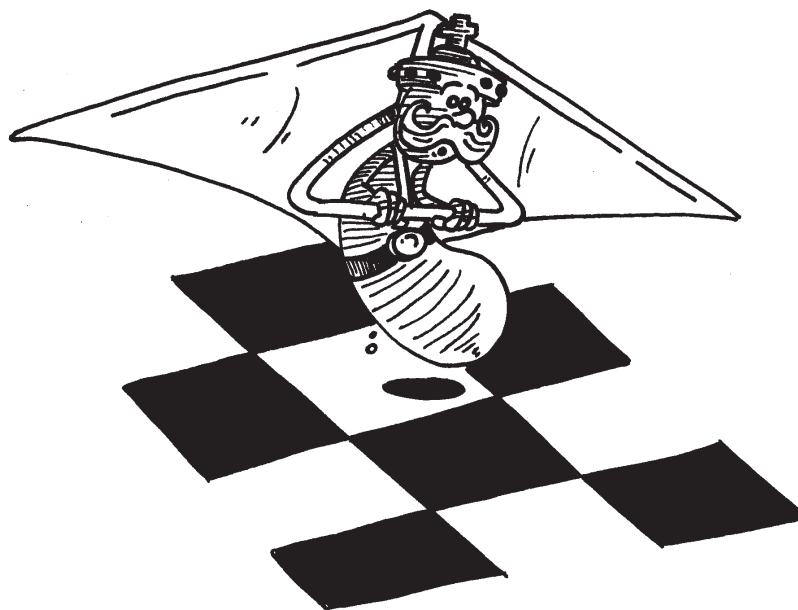Most players have probably seen 06a before. It is a famous puzzle by Sam Loyd.

Sixteen Pieces 06 (mate in 3)

6a. Place the black king on the board so that White has mate in three.

6b. Find the shortest proof game that reaches the position after the placement of the black king (and before White mates in three).
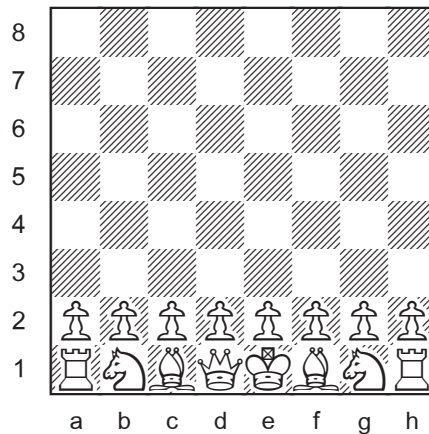
A *proof game* is a sequence of moves from the initial array which proves that a position is legal. A *shortest proof game* (SPG) reaches the given position in the fewest moves possible.

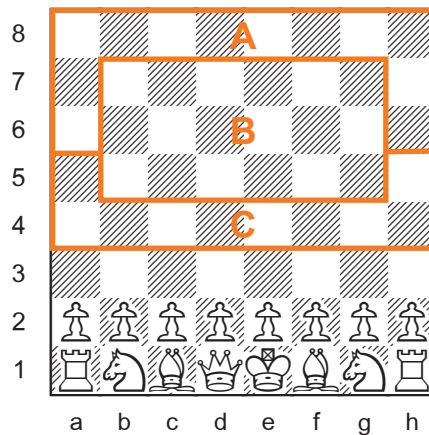For more about proof games, see columns 3 and 8.

In the next puzzle, the black king is placed on the board so that White has a series-mate in a certain number of moves. In a *series-mate*, only White moves and only the final move may be check. For example, if the black king is placed on h4, White has a series-mate in three: 1.e4 2.d4 3.g3#. Black does not get a move. Also, see columns 2, 7, 28.

Sixteen Pieces 07 (series-mate)

The black king has a choice of forty squares. We will divide them into three sections as shown by the orange lines below.
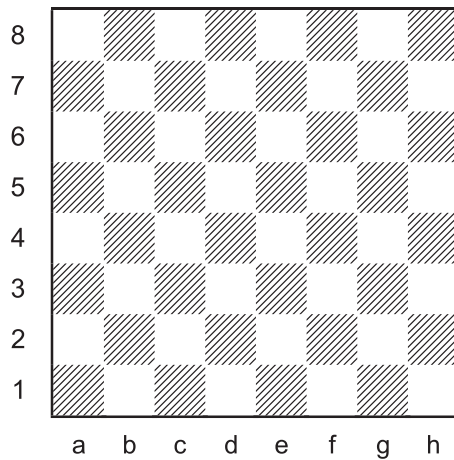

7a. On which square in section A can the black king be placed so that White does **not** have a series-mate in four?

(If you like this sort of thing, find the series-mate in four for the other eleven squares in section A.)

7b. On which square in section B can the black king be placed so that White has a series-mate in four?

7c. If the black king is placed on any square in section C, White has a series-mate in three. On which square is the solution unique? ('Unique' means that White has only one possible sequence of moves.)

In problems 08 and 09, the starting point is an empty board. The task is to construct a position using sixteen white pieces.

In these puzzles, promoted pieces are allowed. This means that pawns are optional. You can use nine queens.

As usual, the two bishops must be placed on opposite-coloured squares.
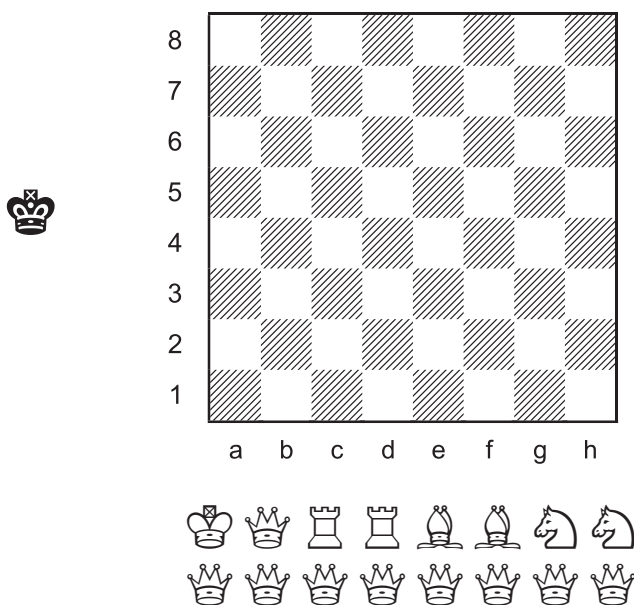
Sixteen Pieces 08 (maximum moves)

8a. Place the sixteen pieces on the board so that they have the most possible moves.
(K + 9Q + 2R + 2B + 2N)

8b. Find the shortest proof game that reaches the constructed position from part 8a.

<u>Sixteen Pieces 09</u> (maximum mates)

Place sixteen white pieces (K + 9Q + 2R + 2B + 2N) and a lone black king on the board so that White has the most possible mates-in-one.

The position must be legal. Among other things, this implies that the two bishops must be on opposite-coloured squares and that Black must have a legal move on the previous turn to reach the position.

New records for Puzzle 04 (minimum moves)

In *Sixteen Pieces part 1* (column 36), the stipulation for each part of puzzle 04 was the following:

> *How many moves are needed from the initial array to reduce the number of possible moves in the resulting position to x?*

The variable x ranged from 16 down to 1. Solutions were given for each value of x, along with a table of records. As expected, some of the marks were improved.

Special thanks to Norwegian IM Geir Sune Tallaksen Østmoe who established new records for 1 to 6 moves and provided essential ideas for further improvements.

[*The new positions and an updated table of records, originally included in this column, are now in the reformatted column 36.*]
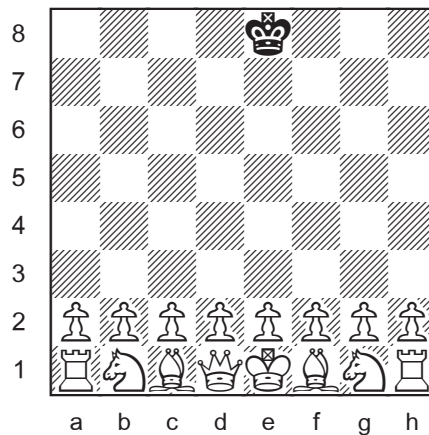
SOLUTIONS

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.

Sixteen Pieces 05 (helpmate in 3)
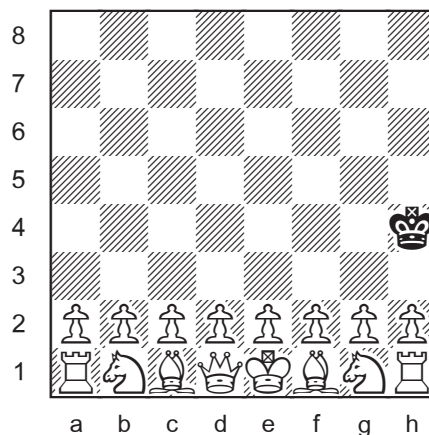
J. Coakley 2013
ChessCafe.com

1...Kf7 2.d4 Kg6 3.Qd2 Kh5 4.Qg5#

The solution is semi-unique. White could also play 2.d3.

Sixteen Pieces 06 (mate in 3)

Sam Loyd 1858
Chess Monthly

6a. Place the black king on h4 for a mate in three.

1.d4
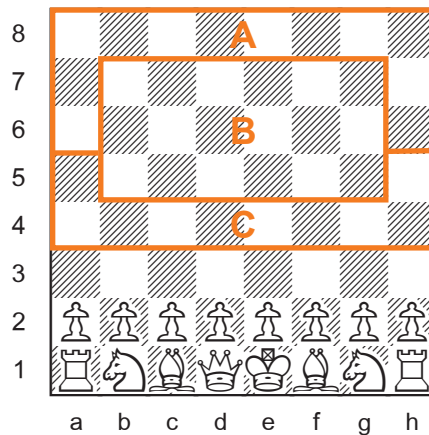 1...Kg4 2.e4+ Kh4 3.g3#
  1...Kh5 2.Qd3 Kg4 (or ...Kh4) 3.Qh3#

6b. The position with the white pieces in the initial array, the black king on h4, and White to move, can be reached in 16.0 moves.

1.Nc3 d5 2.Nxd5 g6 3.Nxe7 b5 4.Nxg6 a6 5.Nxh8 Bd7
6.Nxf7 Qg5 7.Nxg5 Nf6 8.Nxh7 Ne4 9.Nxf8 Nc3
10.Nxd7 Nb1 11.Nxb8 Kf7 12.Nxa6 Kg6 13.Nxc7 Kh5
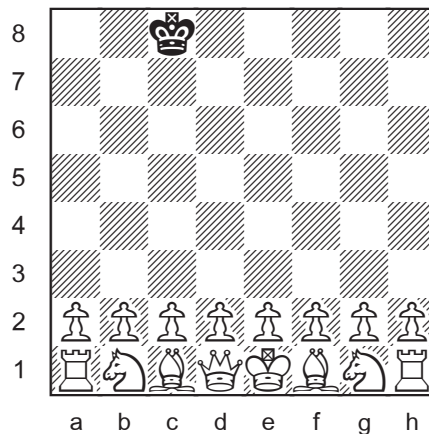14.Nxb5 Ra3 15.Nxa3 Kg5 16.Nxb1 Kh4

A version of this shortest proof game, with the final moves 15...Kh4 16.Nxb1, was given by Scottish composer Walter H. Thompson (1873-1938) in the *British Chess Magazine* (1933). In that case, the diagrammed position is reached in 15.5 moves, with Black to play.

Sixteen Pieces 07 (series-mates)

J. Coakley 2013
ChessCafe.com

7a. With the black king on c8, there is no series-mate in four.

black king on c8
There are thirty-four possible series-mates in five. Here is one line:
1.d4 2.Qd3 3.Qh7 4.Bf4 5.Qc7#

If the king is placed on any of the other eleven squares in section A, White has a series-mate in four. The lines are given below for each square. The number of possible solutions is shown in parentheses.

black king on a6 (2)
1.c4 2.Qb3 3.c5 4.Qb6#
The 2nd and 3rd moves can be switched.

black king on a7 (2)
1.e3 2.Qf3 3.Ba6 4.Qb7#
The 2nd and 3rd moves can be switched.

black king on a8 (2)
1.d4 2.Bf4 3.Qd3 4.Qa6#
The 2nd and 3rd moves can be switched.

black king on b8 (3)
1.e3 2.Qf3 3.Ba6 4.Qb7#
The 2nd and 3rd moves can be switched.
1.d4 2.Qd3 3.Qa6 4.Bf4#

black king on d8 (4)
1.e4 2.Qg4 3.Bb5 4.Qd7#
The 1st move can also be 1.e3; and the 2nd
and 3rd moves can be switched.

black king on e8 (2)
1.e4 2.Qf3 3.Qf6 4.Bb5#
The 1st move can also be 1.e3.

black king on f8 (4)
1.e4 2.Bc4 3.Qh5 4.Qf7# Scholar's Mate!
The 1st move can also be 1.e3; and the 2nd
and 3rd moves can be switched.

black king on g8 (2)
1.e4 2.Qh5 3.Qh6 4.Bh6#
The 1st move can also be 1.e3.

black king on h8 (6)
1.e4 2.Bc4 3.Qg4 4.Qg8#
The 1st move can also be 1.e3; and the 2nd
and 3rd moves can be switched.
1.e3 2.Qf3 3.Bd3 4.Qf8#
The 2nd and 3rd moves can be switched.

black king on h7 (1)
1.e3 2.Qf3 3.Qf8 4.Bd3#
A unique solution.

black king on h6 (6)
1.e3 2.Bd3 3.Qg4 4.Qg6#
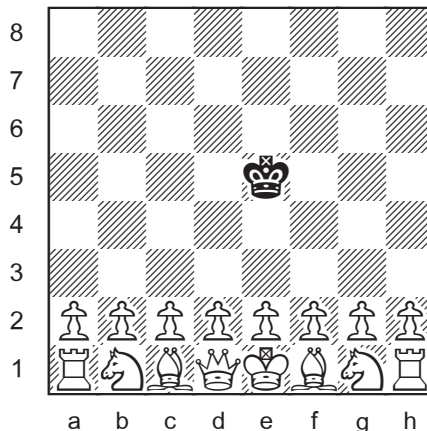The 2nd and 3rd moves can be switched.
1.e4 2.Qf3 3.Qf7 4.d4#
The 4th move can also be 4.d3#.
1.c3 2.Qb3 3.Qf7 4.d4#
The 4th move can also be 4.d3#.

7b. With the black king on e5, White has a series-mate in four.
There are six solutions.

1.e3 2.Bc4 3.Qg4 4.Qe6#
The last move can also be 4.Qf4#; and the 2nd
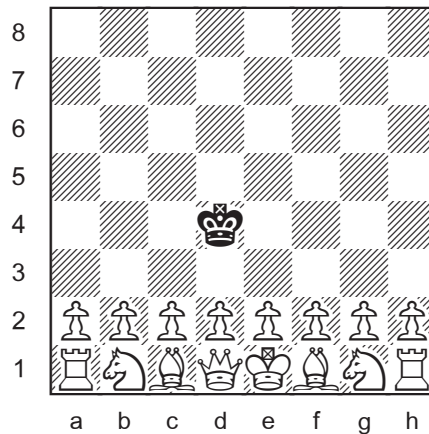and 3rd moves can be switched.
1.e3 2.Bc4 3.Qf3 4.Qf4#
The 2nd and 3rd moves can be switched.

With the black king on c7, d7, or f7, White has a series-mate in six.
On other squares in section B, there is a series-mate in five.

7c. With the black king on d4, White has a unique series-mate in three.

black king on d4
1.e4 2.Qh5 3.Qd5#

If the black king is placed on any of the other nine squares in section C, White has a non-unique series-mate in three. The lines are given below for each square. The number of possible solutions is shown in parentheses.

black king on a5 (3)
1.e4 2.Qe2 3.Qb5#
The 1st move can also be 1.e3.
1.c4 2.Qb3 3.Qb5#

black king on a4 (18)
1.e4 2.b4 3.c3#
1.e4 2.Qh5 3.Qb5#
1.e4 2.Qf3 3.Qa3#
1.d4 2.Bd2 3.c4#
1.a3 2.b4 3.c4#
1.a3 2.b4 3.Nc3#
1.b4 2.Ba3 3.c4#
1.Na3 2.b4 3.c3#
Other lines use the same ideas.

black king on b4 (5)
1.e4 2.Qh5 3.Qb5#
The 1st move can also be 1.e3; and the 2nd move can also be 2.Qe2.
1.e4 2.Qf3 3.Qa3#

black king on c4 (9)
1.d4 2.c3 3.e4#
The 1st and 2nd moves can be switched.
The move c3 can be replaced by a3.
1.d4 2.c3 3.Qb3#
The 1st and 2nd moves can be switched.
1.b4 2.c3 3.e4#
The 1st and 2nd moves can be switched.
1.d4 2.Qd2 3.e4#

black king on e4 (12)
1.d4 2.g4 3.Bg2#
The 1st and 2nd moves can be switched.
The 3rd move can also be 3.Nc3#.
1.e3 2.Qh5 3.d3#
The 3rd move can also be 3.Nc3# or 3.f3# or 3.Bd3#.
1.e3 2.d4 3.Qf3#
The 1st and 2nd moves can be switched.
1.d4 2.c4 3.Qd3#
The 1st and 2nd moves can be switched.

black king on f4 (9)
1.e4 2.f3 3.d4#
The 1st and 2nd moves can be switched.
The move e4 can be replaced by g4.
1.e4 2.Qh5 3.Qf5#
The 3rd move can also be 3.d3#.
1.e4 2.Nc3 3.d4#
The 1st and 2nd moves can be switched.
1.e4 2.Qe2 3.d4#

black king on g4 (17)
1.g3 2.d4 3.e4#
The 1st and 2nd moves can be switched. The move d4 can
be replaced by d3 or f4 or h4 or Nh3 (all guarding g5).
1.d4 2.h4 3.e4#
The 1st and 2nd moves can be switched.
1.d4 2.Qd2 3.Qg5#
The 1st and 2nd moves can be switched.
1.d4 2.Qd3 3.Qh3#

black king on h4 (21)
1.e4 2.h3 3.Qg4#
The 1st and 2nd moves can be switched.
The move e4 can be replaced by e3.
1.e4 2.d4 3.g3#
The 1st and 2nd moves can be switched.
The move d4 can be replaced by d3 or f4 or Nh3.
1.e3 2.f4 3.g3#
The 1st and 2nd moves can be switched.
The move f4 can be replaced by Nh3.
1.d4 2.Qd2 3.Qg5#
The 1st and 2nd moves can be switched.
1.h3 2.g4 3.Nf3#
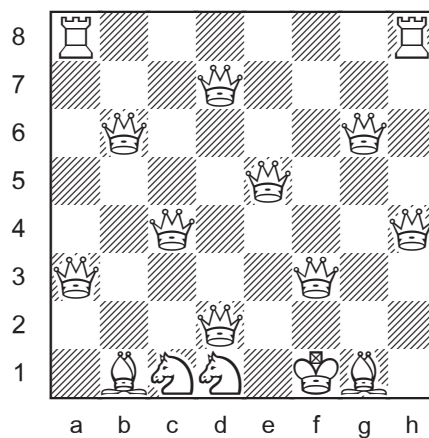The 1st and 2nd moves can be switched.
1.d4 2.Qd3 3.Qh3#

black king on h5 (2)
1.d4 2.Qd2 3.Qg5#
The 1st move can also be 1.d3.

Sixteen Pieces 08 (maximum moves)

8a.
version of
Nenad Petrovic 1946
Fairy Chess Review

White has 221 possible moves.
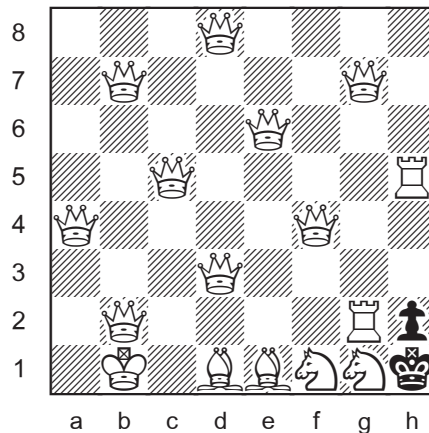(K4 + R19 + B10 + N8 = 41)
(Q: 16 + 19 + 22 + 19 + 21 + 26 + 21 + 19 + 17 = 180)

This is the current record for most moves by the sixteen pieces with no black pieces on the board.

The original Petrovic position had a black king on a1 and black pawns on a2 and b2. It set the record for the most possible white moves (218) in a legal position.

British composer Anthony Dickins (1914-1987), later equalled the record using only two black pieces.
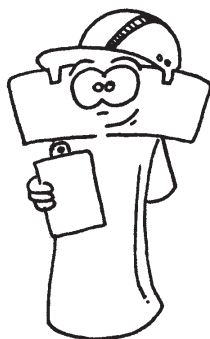
A.S.M. Dickins 1971
A Guide to Fairy Chess

A legal position in which White has 218 possible moves.
(K4 + Q176 + R19 + B12 + N7)

The record of 218 moves in a legal position has not been established as the maximum by a computer program. The mark has stood for 67 years. Can anyone break it?

8b.   The position given above (8a) with 221 possible moves can be reached in 60 moves.
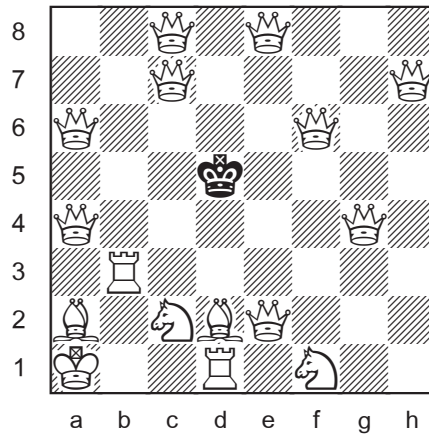
1.a4 ... 5.a8=Q ... 10.b8=Q ... 15.c8=Q ... 20.d8=Q ...
25.e8=Q ... 30.f8=Q ... 35.c8=Q ... 40.d8=Q
41.Qaf3 42.Qhe5 43.Ra8 44.Rh8 45.Nc3 46.Be3 47.Bd3 48.Ne2
49.Qd2 50.Nd1 51.Bg1 52.Bb1 53.Nc1 54.Kf1 55.Qbb6 56.Qcc3
57.Qdh4 58.Qed7 59.Q8a3 60.Qgg6

Sixteen Pieces 09 (maximum mates)

A.S.M. Dickins 1970

The Problemist

White has 105 possible mates-in-one.

(K0 + R14 + B9 + N3 = 26)

(Q: 7 + 9 + 10 + 6 + 8 + 10 + 10 + 11 + 8 = 79)

The previous black move could have been ...Kc5-d5.

Until next time!