THREE MULTIPLEXES
and CHESS CAFE PUZZLERS CUP

number 27   March 2, 2013

The Puzzling Side of Chess is pleased to announce its first annual composing contest. Make up your own puzzles, send them in, and win prizes. It's easy!

Here are the details for the ***Chess Cafe Puzzlers Cup***. We're standing by for your contest entries and ready to engrave your name on the Cup. Good luck!
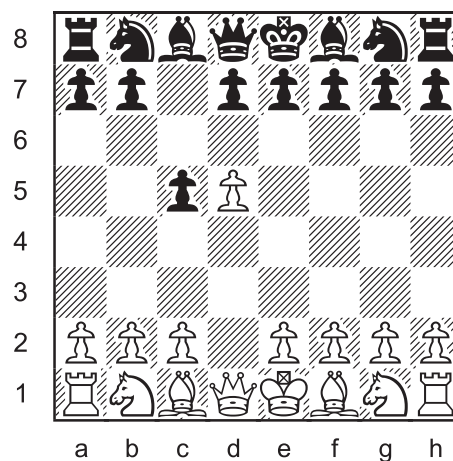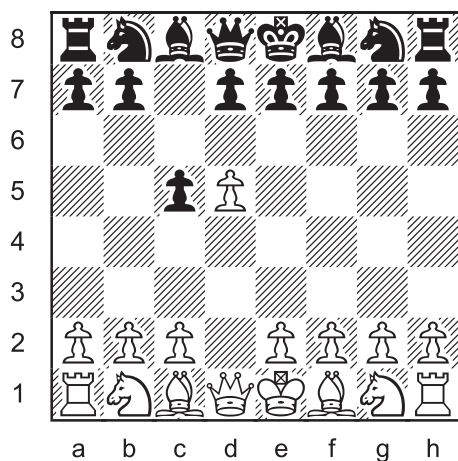
In the meanwhile, it's business as usual for the rest of this column, which features three multiplex puzzles.

A *multiplex* is a type of problem which has multiple aspects or can be solved in multiple ways.

1. THE UNBEKNOWN BENONI-PLEX

The following diagrams are identical. But the positions are not the same. How can that be?

According to the laws of chess, two positions are identical if they have the same arrangement of pieces and the same move possibilities. Normally, this interpretation of "identical" is only relevant to draw claims involving threefold repetition. But it is also applicable to this puzzle question:

> **1A. How many different positions can be shown using this same diagram?**
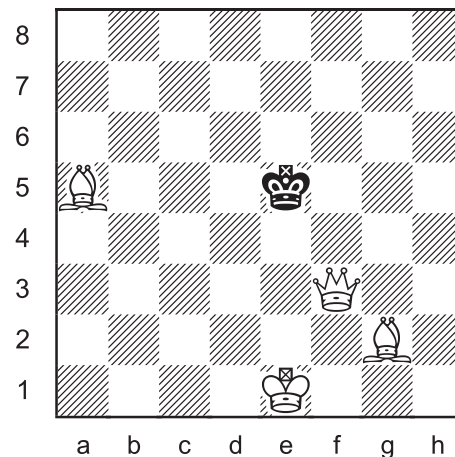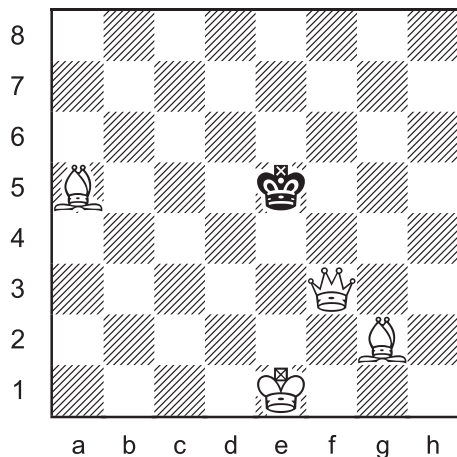
When you figure that one out, you might want to try the more general case:

> **1B. What is the maximum number of different positions that can be shown using a single diagram?**
>
> **Compose a diagram that demonstrates the maximum.**

2. STIPULATION MULTIPLEX

The two diagrams below are identical. But the puzzles are not the same. They each have a different stipulation.

In fact, the same diagram can be used for several different puzzles. Combining multiple tasks into a single position can be a fun thing to do.

2A. Double Whammy

"Double whammy" is another name for a *series-mate in two*. See column 2 in the archives.

> White plays two moves in a row to mate Black.
> The first move may not be check.
> Both moves may be with the same piece.
> Black does not get a turn.

2B. Helpmate in 1

In a helpmate, Black moves first and both players cooperate to checkmate the black king.

> Black to play. Find the move which
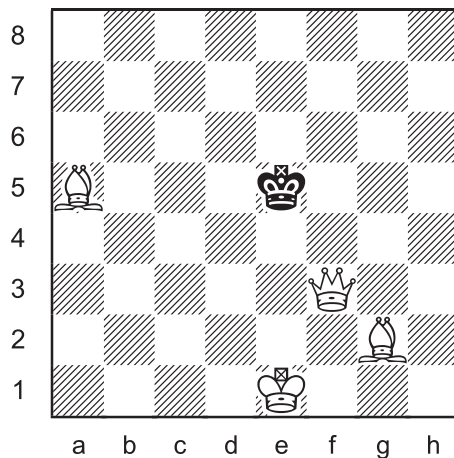> allows White to mate in one.

2C. Switcheroo

The goal in a switcheroo is to put the black king in checkmate by switching the position of two pieces. No actual chess moves are made. The pieces simply swap squares. Any two pieces can switch places. Colours do not matter. You can trade white with white, black with black, or white with black. See column 4.

> Switch two pieces so that Black is in checkmate.

Parts B and C were probably too easy for most players. When I composed the position, difficulty was not a concern. My main objective was to see if it was possible to make a multiplex puzzle that included a double whammy, helpmate in 1, and switcheroo. The idea arose last year from a discussion with *Novice Nook* columnist Dan Heisman. By the way, his new book *The World's Most Instructive Amatuer Game Book* is on sale. Check it out.

The following parts of the puzzle were added recently when I became more interested in the limits of "multiplexing". Parts D and E are fairly simple, but perhaps the others will provide a challenge. Still the same diagram.
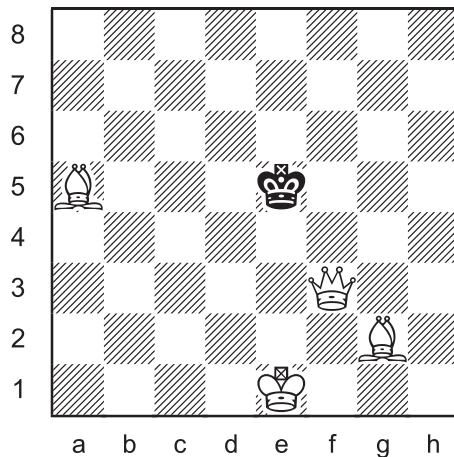

2D. <u>White Pawn Additive</u> (mate in one)

Add a white pawn to the board
so that White has mate in one.

2E. <u>Mate in One Squares</u>

The black king is safe on e5 from an immediate mate. However, if he stood on certain other squares, he could be checkmated in one move.

On which seven squares can the black
king be placed (instead of e5) so that
White has mate in one?

```
8
7
6
5    ♗                    ♚
4
3                      ♕
2                          ♙
1              ♔
   a  b  c  d  e  f  g  h
```

2F. <u>Black Pawn Additive</u> (mate in 2)

Add a black pawn to the board on the 4th rank
so that White has mate in two.

2G. <u>Black Pawn Additive</u> (mate in 2)

Add a black pawn to the board on the 6th rank
so that White has mate in two.

2H. <u>Black Pawn Additive</u> (mate in 2)

Add a black pawn to the board on the 7th rank
so that White has mate in two.

2I. <u>Inverted Loyd</u>

In an "inverted loyd", pieces are added to the board to set up a forced
mate. See column 5. Usually white pieces are added so that White
can mate, but in this case the colours are reversed.

Place a black rook, bishop, and knight on the
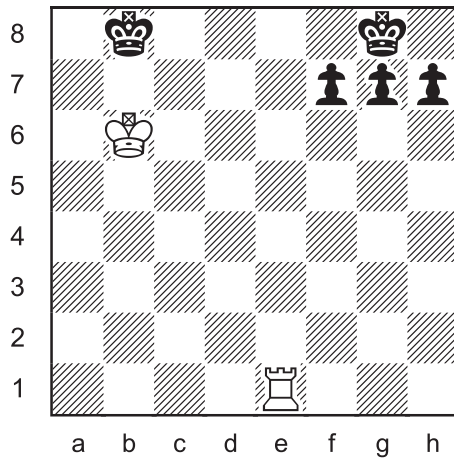board so that Black to play has mate in one.
Find <u>two solutions</u> with different mating moves.   ♜ ♝ ♞
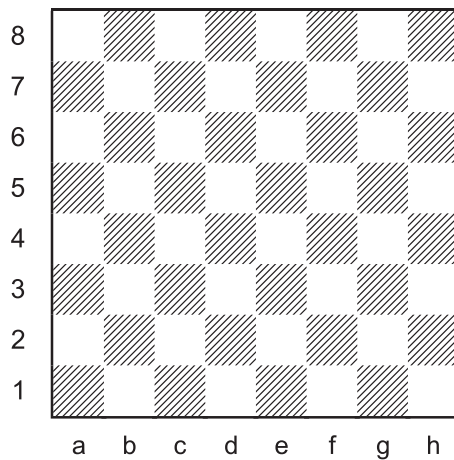
3. <u>REX MULTIPLEX</u>

"Rex multiplex" (or "multirex") is the name given to problems in which
one side has two or more kings. Of course, all such positions are
illegal.

As you can imagine, odd questions arise when two kings are checked
at the same time. The rules concerning this situation vary depending
on the stipulation. In the puzzles presented here, the goal is a
"supermate". All the black kings are to be checkmated simultaneously
with a single move. The next diagram is a basic example.

Both black kings are mated by 1.Re8##.

In the following *construction tasks*, the object is to compose a position in which a single move checkmates the most kings. Which type of piece do you think can deliver the most mates?

All positions may contain any additional pieces you like, white or black. "Discovered checkmates" are permitted.

3A. <u>Rex Multiplex</u> (maximum mates by a bishop move)

Construct a position with as many black kings as possible so that a single bishop move checkmates them all.

3B. <u>Rex Multiplex</u> (maximum mates by a rook move)

Construct a position with as many black kings as possible so that a single rook move checkmates them all.

3C. <u>Rex Multiplex</u> (maximum mates by a king move)

Construct a position with as many black kings as possible so that a single king move checkmates them all.

3D. <u>Rex Multiplex</u> (maximum mates by a queen move)

Construct a position with as many black kings as possible so that a single queen move checkmates them all.

3E. <u>Rex Multiplex</u> (maximum mates by a knight move)

Construct a position with as many black kings as possible so that a single knight move checkmates them all.
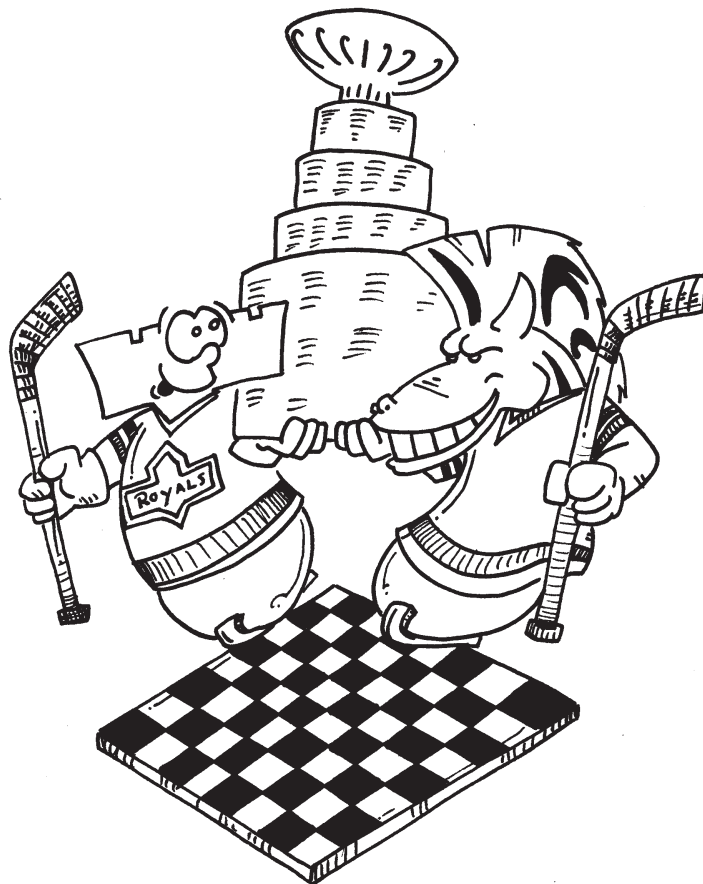
3F. <u>Rex Multiplex</u> (maximum mates by pawn promotion)

Construct a position with as many black kings as possible so that a single pawn promotion checkmates them all.

3G. <u>Rex Multiplex</u> (maximum mates by a pawn move)

Construct a position with as many black kings as possible so that a single pawn move checkmates them all. Promotion is not allowed.
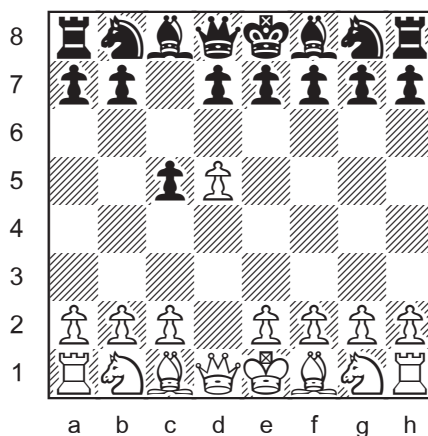
SOLUTIONS

Except for the two multirex positions by Gustavus Reichhelm and George Koltanowski, and the solution to question 1b, all puzzles and solutions by J. Coakley, *ChessCafe.com 2013*.

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.

1. <u>THE UNBEKNOWN BENONI-PLEX</u>

1A. Forty-eight different positions can be shown using this same diagram. The differences are based on whose turn it is, the right to castle, and the possibility of an en passant capture.

This common position from the Benoni Defence occurs after 1.d4 c5 2.d5. But the same arrangement of pieces can also be reached by billions of other move sequences. For example, the diagram can be reached with White to play by 1.d4 c6 2.d5 c5.

Two positions can only be identical if it is the same player's turn to move. In general, if neither king is in check, any diagram can represent two different positions, one with White to play and one with Black to play.

It should be noted at this point that according to the laws of chess, two positions can be identical even if pieces of the same kind have traded places. For example, the diagram can be reached by the strange move order 1.d4 Nf6 2.Nf3 c5 3.d5 Ng8 4.Ne5 Nf6 5.Nc4 Ng8 6.Nca3 Nf6 7.Nd2 Ng8 8.Nf3 Nf6 9.Nb1 Ng8 10.Ng1. The white knights have swapped squares, but the position is still identical to 1.d4 c5 2.d5 because the same kind of pieces occupy the same squares and all the move possibilities are the same.

After the move sequence 1.d4 c6 2.d5 c5, White cannot capture *en passant* since the black c-pawn only advanced one square. But taking *en passant* is possible from the diagram after 1.d3 Nf6 2.d4 Ng8 3.d5 c5. (4.dxc6 e.p.)

Two positions are not identical if there is a possible *en passant* capture in one and not in the other.

In the diagram, each player has four possibilities concerning their right to castle, depending on whether the king or rooks have previously moved.
      a. They can castle on either side.
      b. They can castle kingside but not queenside.
      c. They can castle queenside but not kingside.
      d. They cannot castle on either side.

Here are some sample lines from the *Encyclopaedia of Weird Openings*:

1.d4 c5 2.d5 Nf6 3.Nf3 Ng8 4.Rg1 Nf6 5.Rh1 Ng8 6.Ng1
White has the right to castle queenside but not kingside.

1.d4 c5 2.d5 Nf6 3.Kd2 Ng8 4.Ke1
White cannot castle on either side.

Two positions are not identical if the castling rights for either player are different.

Time for some math. To determine the number of possible positions shown in the given diagram with **White to move**, we multiply these numbers:

  2   possibilities for *en passant* capture
  4   possibilities for castling rights by White
  4   possibilities for castling rights by Black

2 x 4 x 4 = 32 possible positions with White to move

With **Black to move**, we only multiply for castling rights:
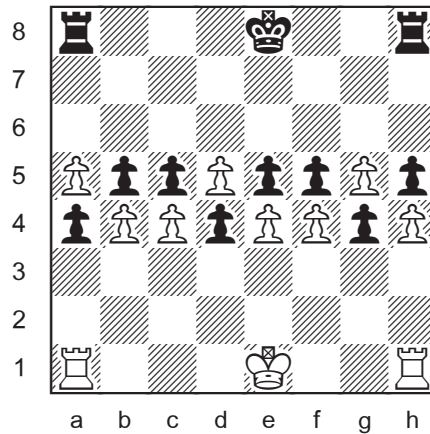 4   possibilities for castling rights by White
  4   possibilities for castling rights by Black

4 x 4 = 16 possible positions with Black to move

Total possible positions = 32 + 16 = 48

1B. <u>General Case</u>

The maximum number of different positions that can be shown with a single diagram is **192**. The calculation is similar to part 1A.

In this diagram, the possibilities concerning whose turn it is (x2) and the rights to castle for White (x4) and Black (x4) are the same as in part 1A. However, the possibilities for *en passant* captures are obviously greater.

The position is legal. Six captures are sufficient to generate this dynamic pawn structure. (4W + 2B) or (2W + 4B).

No matter whose turn it is, the player with the move has six possibilities concerning *en passant*, depending on whether the opponent has just advanced a pawn two squares.

- · axb e.p. is possible.
- · dxc e.p. is possible.
- · dxe e.p. is possible.
- · gxf e.p. is possible.
- · gxh e.p. is possible.
- · No e.p. capture is possible.

Let's multiply.

Maximum possible positions = 2 x 4 x 4 x 6 = 192

[In the original column, the solution for 1B was given as 160, based on five possibilities for *en passant*. Thanks to Andrew Buchanan for pointing out the correct answer. His solution, like that in the diagram above, showed that an additional *en passant* capture could be added for each side.]

2. STIPULATION MULTIPLEX

2A. Double Whammy

1.Bd8
2.Qf6#
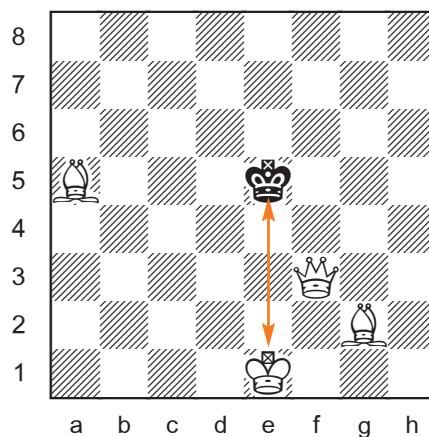
Wham, bam, thank you, ma'am.

2B. Helpmate in 1

1...Kd4
2.Qc3#

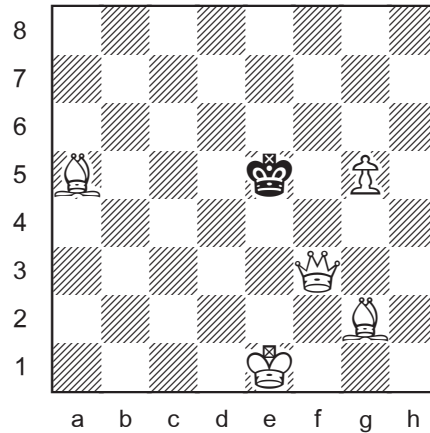The same mating pattern as before but on different squares.

2C. Switcheroo

Ke1↔Ke5

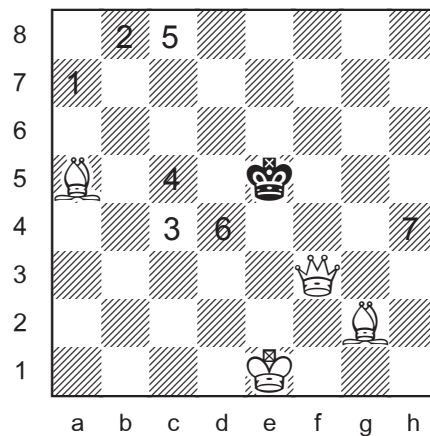The ever popular *crisscross mate*, a QB specialty.

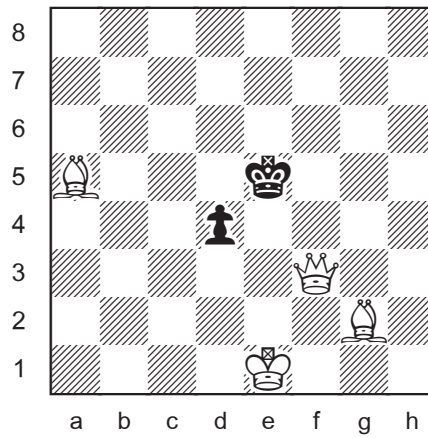## 2D. <u>White Pawn Additive</u> (mate in one)

Add white pawn on g5.

1.Qf6#

2E. <u>Mate in One Squares</u>

The black king can be mated in one move on these seven squares:

1. Black king on a7: 1.Qa8# or 1.Qb7#
2. Black king on b8: 1.Qa8# or 1.Qb7#
3. Black king on c4: 1.Qd5#
4. Black king on c5: 1.Qd5#
5. Black king on c8: 1.Qb7#
6. Black king on d4: 1.Qc3#
7. Black king on h4: 1.Bd8#
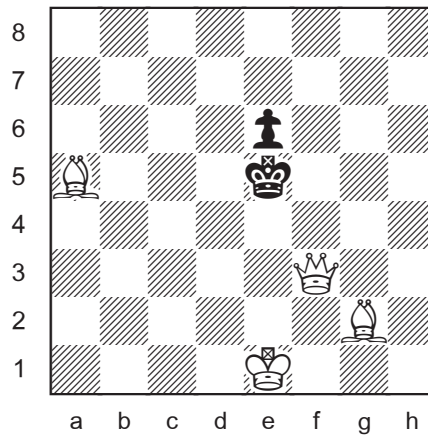
2F. **Black Pawn Additive** (mate in 2)

Add black pawn on d4.

    1.Bd8
        1...Kd6 (or 1...Ke6) 2.Qd5#
        1...d3 2.Qf6#

2G. **Black Pawn Additive** (mate in 2)

Add black pawn on e6.

    1.Bb4 Kd4
    2.Qc3# (or 2.Qe4#)

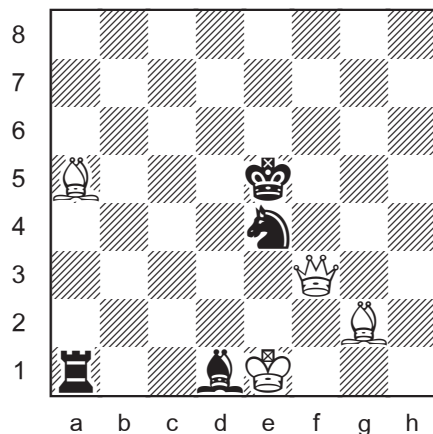## 2H. <u>Black Pawn Additive</u> (mate in 2)

Add black pawn on d4.

    1.Bc3+
        1...Kd6 2.Qc6#
        1...Ke6 2.Qd5#

2I. <u>Inverted Loyd</u>

Add black Ra1 Bd1 Ne4.

1...Bxf3#

Discovered check and mate.
The black rook could also be placed on b1 or c1.
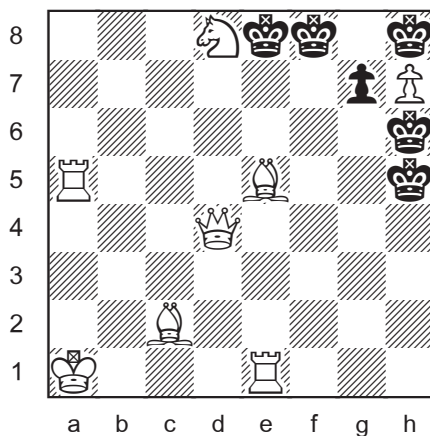
second solution

Add black Ra2 Bd8 Ne3.

1...Bxa5

The black rook could also be placed on b2 or c2.
The black bishop could also be placed on b6 or c7.

3. REX MULTIPLEX

3A. Rex Multiplex
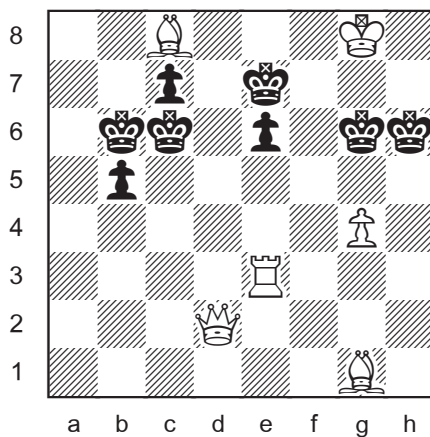(maximum mates by a bishop move)

1.Bxg7#####
Five kings are mated, two by discovered check.
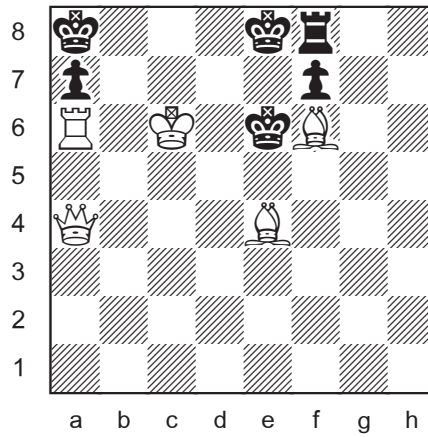
3B. Rex Multiplex
(maximum mates by a rook move)

1.Rxe6#####
Five kings are mated, two by discovered check.
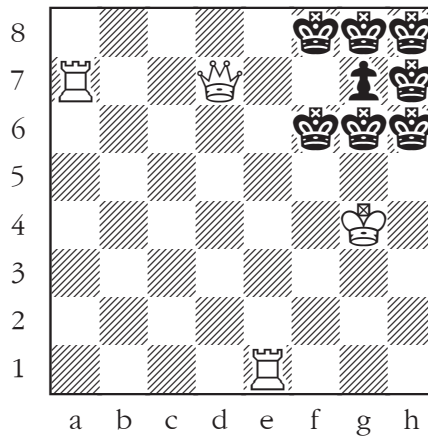
3C. <u>Rex Multiplex</u>
(maximum mates by a king move)

1.Kc7###

Three kings are mated, all by discovered check.

3D. <u>Rex Multiplex</u>
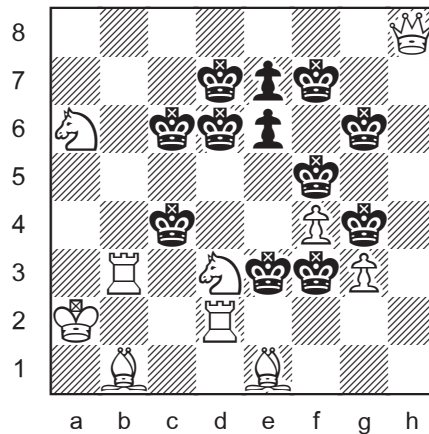(maximum mates by a queen move)

1.Qxg7#######

Seven kings are mated, none by discovered check.

3E. Rex Multiplex
(maximum mates by a knight move)
Gustavus Reichhelm 1882

1.Ne5#########
Ten kings are mated, three by discovered check.

This position gets the grand prize for most kings mated by a single move. And the winning piece is the knight.
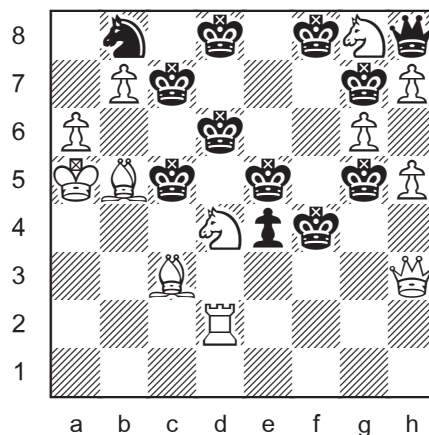
Gustavus Reichhelm (1839-1905) was the champion of Philadelphia for many years and a well known chess writer.

I have seen several dates given for this problem, including 1920 and 1935. However, 1882 seems more likely. Does anyone know the original source of publication?

I was surprised to discover the following multirex position by grandmaster George Koltanowski (1903-2000). Born in Antwerp, Belgium, "Kolty" moved to the United States in 1940. He was famous for his skill at blindfold chess, and once played 34 games simultaneously, a world record at the time. His many chess exhibitions always included a blindfolded knight tour!?
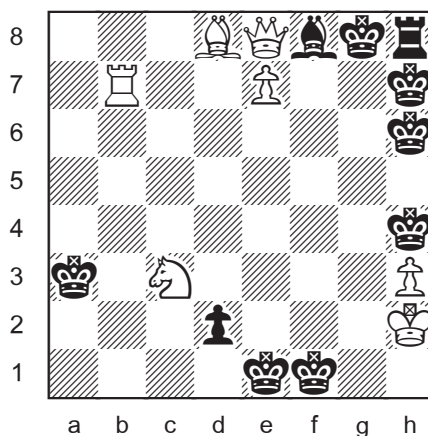
George Koltanowski 1978
Chessnicdotes

1.Ne6#########

With just nine kings mated, it is one short of the maximum. There are only two discovered checks, compared with three in the Reichhelm position.

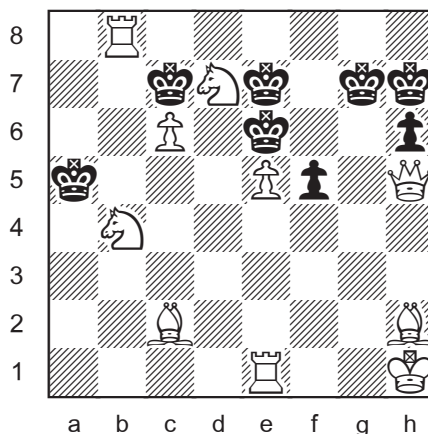### 3F. Rex Multiplex
(maximum mates by pawn promotion)

1.exf8=Q#######
Seven kings are mated, three by discovered check.

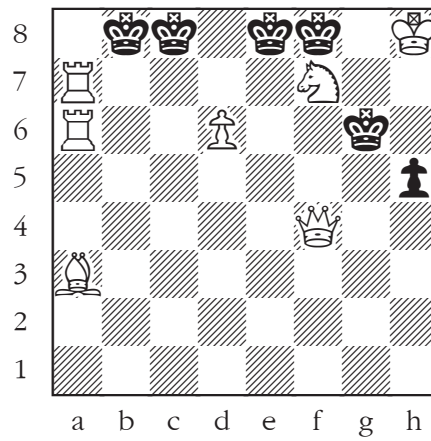### 3G. Rex Multiplex
(maximum mates by a pawn move)

1.exf6 e.p.######
The previous move was ...f7-f5, allowing *en passant*.
Six kings are mated, four by discovered check.

A fifth discovered check is possible by adding a white (obtrusive) bishop on h3. But it would not increase the number of mates.

Without an en passant capture, five is the maximum number of mates by a pawn move, as in the next diagram.

1.d7#####

Five kings are mated, three by discovered check.

Until next time!

THE 2013 CHESS CAFE PUZZLERS CUP

sponsored and organized by **ChessCafe.com**

ChessCafe.com is pleased to announce our first annual puzzle composing competition. The contest is being held as part of *The Puzzling Side Of Chess,* the popular column by Canadian master Jeff Coakley.

Make up your own puzzles, send them in, and win prizes. It's easy!

ELIGIBILITY. The *ChessCafe Puzzlers Cup* is an open contest. Anyone may enter. All entries must be original puzzles composed by the person submitting them.

WINNERS. The winning puzzles will be published at the end of November 2013 on *The Puzzling Side of Chess*.

PRIZES. Each winner will receive a "shop coupon" from *Shop.ChessCafe.com*, which can be applied to any purchase from our extensive selection of chess products. The value of the coupons is as follows:
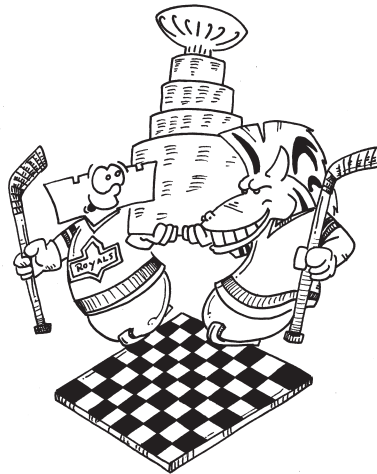
<div align="center">

First prize $150
Second prize $100
Third prize $75
Honourable Mentions 2 x $50

</div>

ENTRIES. Entries should be submitted by e-mail to info@chesscafe.com. Please write "Puzzlers Cup" in the subject line. The deadline is October 31, 2013. There is a limit of three entries per person.

RULES.
1. Puzzles must use the standard pieces (king, queen, rook, bishop, knight, pawn) and a standard 8 x 8 board. Unorthodox pieces or irregular boards are not permitted.
2. Direct mates and endgame studies are not allowed. Also excluded are game-like positions where the goal is to find the best move based on normal strategy.
4. There is no other restriction on stipulations. Helpmates and selfmates are allowed.
5. Submission of a puzzle constitutes permission to publish it on Chesscafe.com.

CRITERIA. Puzzles will be judged for creativity, cleverness, and popular appeal.

Okay, everyone, we're standing by for your contest entries and ready to engrave your name on the Cup. Good luck!