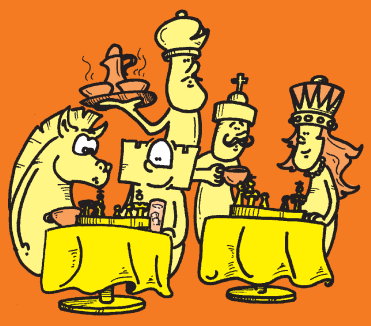


THE PUZZLING SIDE OF CHESS

Jeff Coakley

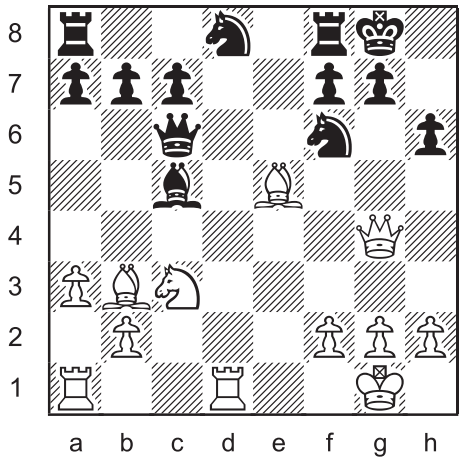
CYCLOTRONS: THINKING IN CIRCLES

number 119 July 30, 2016

The future is here. Strap on your helmet. We're going for a ride.

A *cyclotron* is a three-way switcheroo. Instead of switching two pieces, we switch three. If you're new to this type of puzzle, the rules are given below.

Cyclotron 39



Cycle three pieces so that Black is in checkmate.

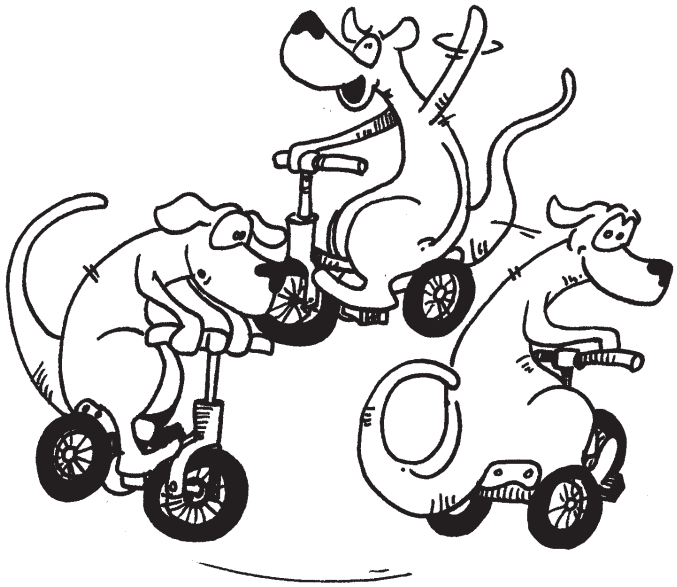
CYCLOTRONS

Switch the position of three pieces so that Black is in checkmate. No actual chess moves are made. The pieces simply swap squares. The pieces trade places in a "cycle". Piece A goes to square B, piece B goes to square C, and piece C goes to square A.

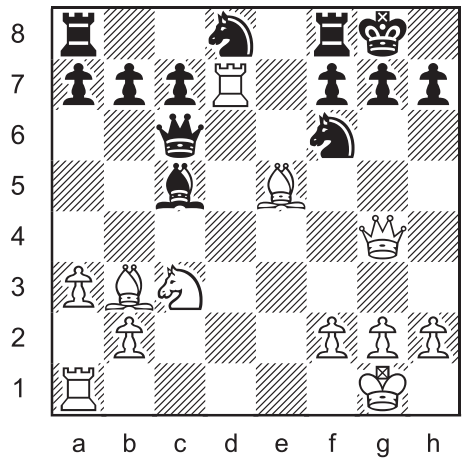
Any three pieces can trade places. Colours do not matter. The cycled pieces can be all white, all black, or a mix of both. Cycling the black king is a common trick.

The position after the cycle must be legal. This rule implies several things.

- *a) A pawn cannot be on the 1st or 8th rank.*
- *b) Both kings cannot be in check.*
- *c) There must be a way to reach the position with a legal white move. Impossible checks, especially double checks, are a frequent "violation".*
- *d) In some cases, retrograde analysis is required to decide if the position after a cycle is legal.*



Cyclotron 40



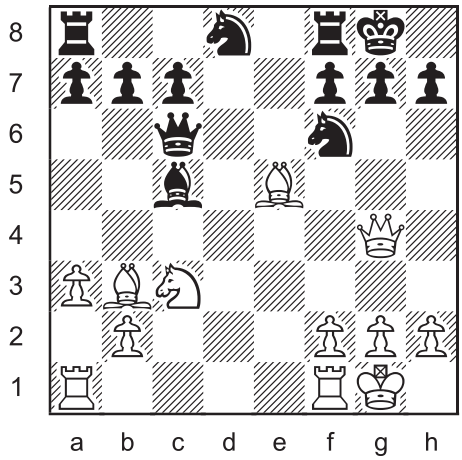
Cycle three pieces so that
Black is in checkmate.

The Revolutionary Spokeless Smart Bike

Cyclotron Cycles (*Nice, France*)

www.cyclotronbike.com

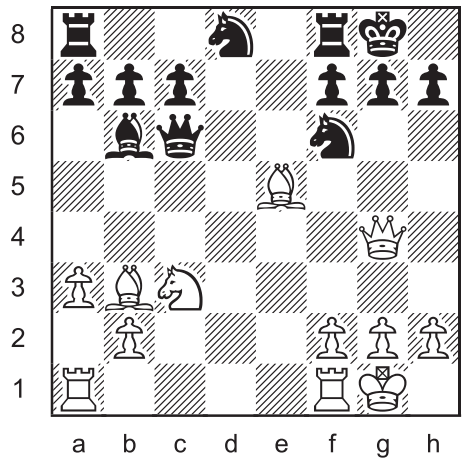
Cyclotron 41



Cycle three pieces so that
Black is in checkmate.

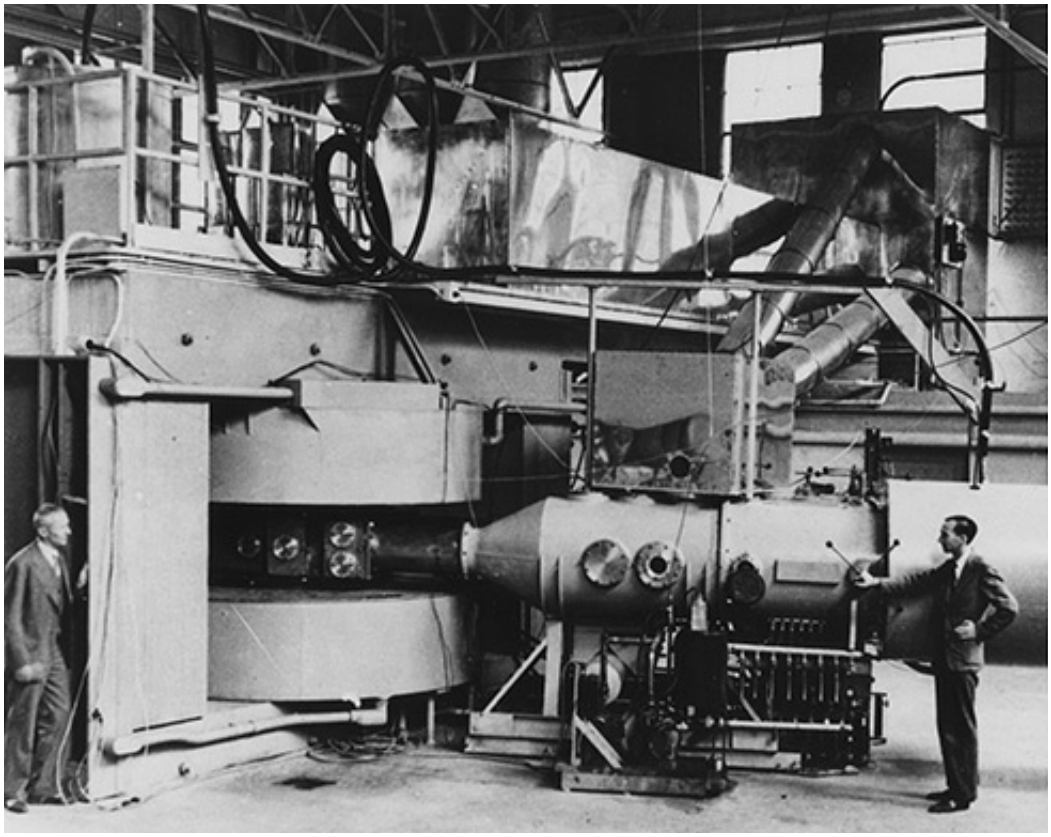
For more information on ordinary switcheroos, see column 4.

Cyclotron 42



Cycle three pieces so that
Black is in checkmate.

A *cyclotron* is a particle accelerator. It was invented by Ernest Lawrence in 1932 at the University of California, Berkeley. Among other things, it has been used to produce the element *plutonium*.



Berkeley 1939

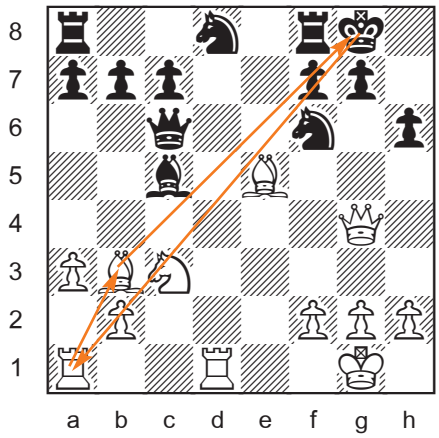
SOLUTIONS

All cyclotrons by J. Coakley. *Puzzling Side of Chess* (2016).

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. Other columns with similar problems can be found in the Puzzling Side archives (55, 89, 92, 95).

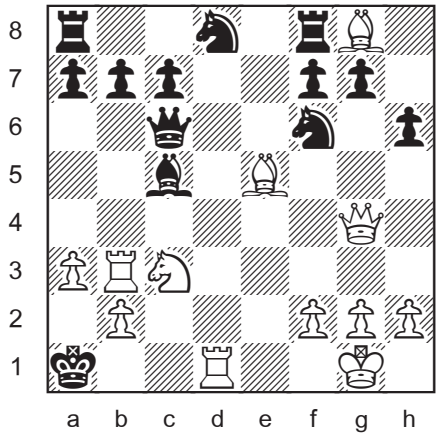
Cyclotron 39



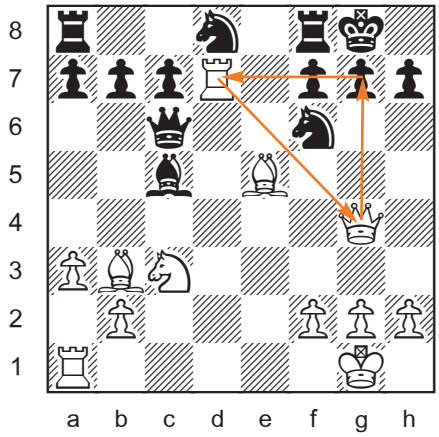
Ra1→b3 Bb3→g8 Kg8→a1

The illegal cycle Rd1→d8 Nd8→g8 Kg8→d1 is triple check.

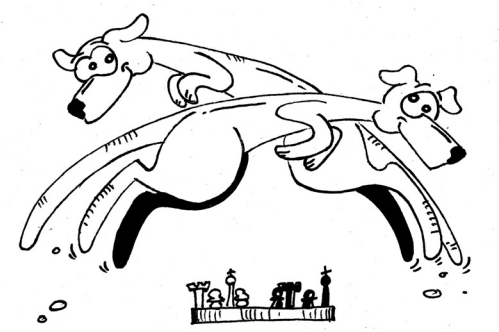
The order in which the pieces are cycled is not important. The resulting position will still be the same. See diagram below.



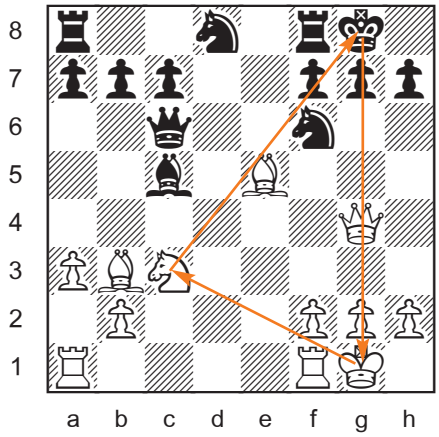
Cyclotron 40



Rd7→g4 Qg4→g7 g7→d7



Cyclotron 41

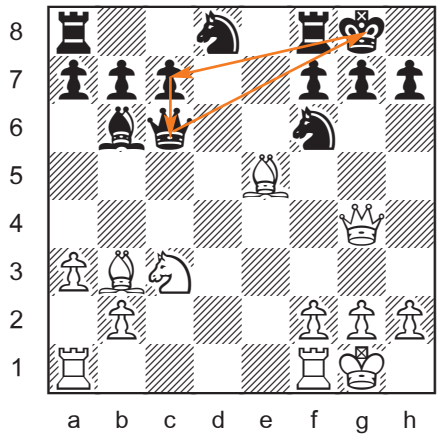


Kg1→c3 Nc3→g8 Kg8→g1

The cycles Kg1→b3 Bb3→g8 Kg8→g1 and Ra1→b3 Bb3→g8 Kg8→a1 are illegal because a white bishop cannot be on g8 with black pawns on f7 g7 h7.

The cycle Kg1→a8 Ra8→g8 Kg8→g1 is illegal because the white king could not “get inside” the black pawn structure to reach a8.

Cyclotron 42



Qc6→g8 Kg8→c7 c7→c6

Cycles involving Bb3→g8 or Kg1→a8 are illegal for the same reasons as in problem 41.

Until next time!