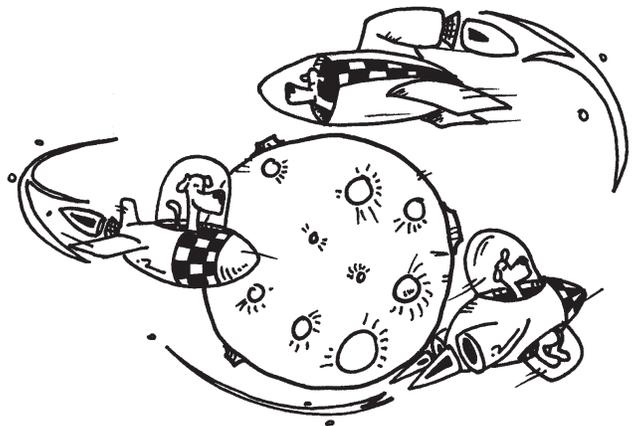# THE PUZZLING SIDE OF CHESS

Jeff Coakley

CYCLOTRONIC LIFE
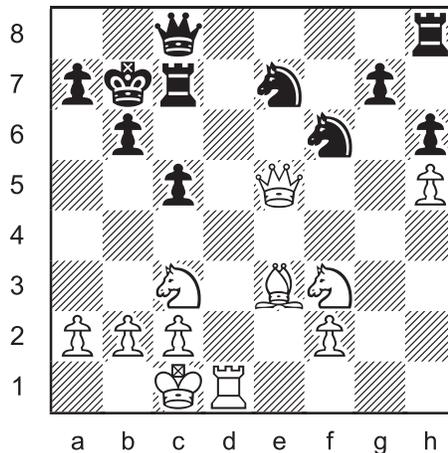## Reflections on Rotations
number 177   April 24, 2019

The world turns round, the days spin by.
Like a whirlwind in the sky, in the blink of an eye.

Cyclotron 65

Cycle three pieces so that Black is in checkmate.
(*See rules on next page.*)

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.
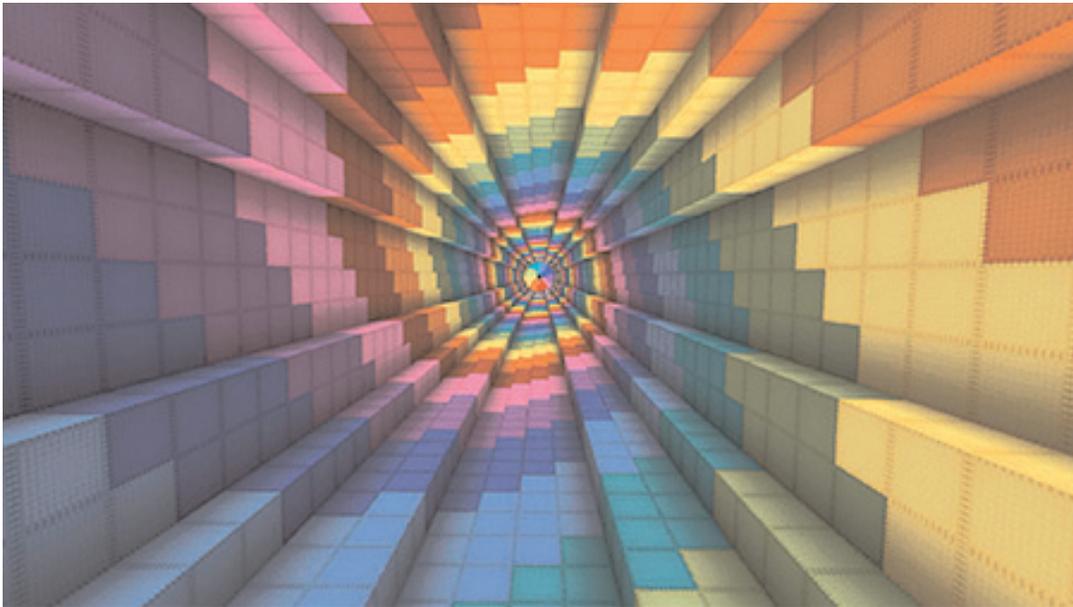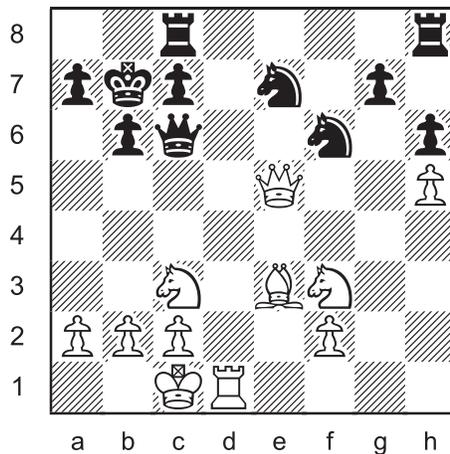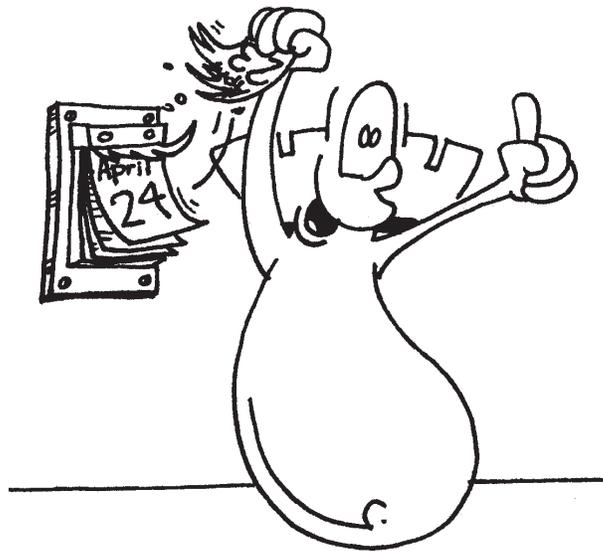

Cyclotron 66
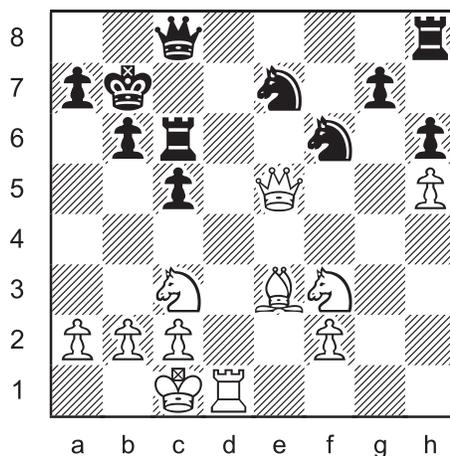
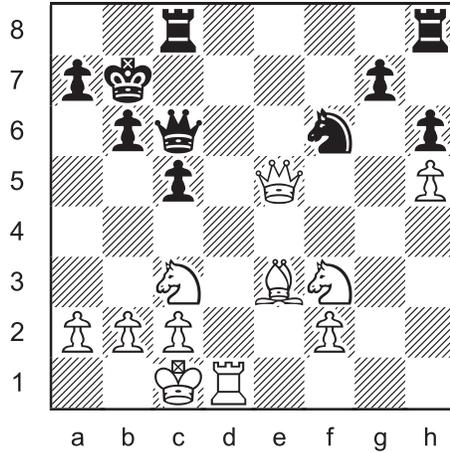Cycle three pieces so that Black is in checkmate.

Cyclotron 67

Cycle three pieces so that Black is in checkmate.

It took 25,000 days to get this far.
That's a lot of turns around the block.
Around the clock.
Sun up, sun down,
One-fortieth of a million times.

Someone living on the equator spins 25,000 miles everyday. That's the circumference of the Earth. But if you're somewhere on the 51st parallel, like Calgary or the Belgian coast, it's only 25,000 kilometres.

Over 1000 miles per hour in the first case. 1000 km/h in the other. There's no such thing as sitting still.
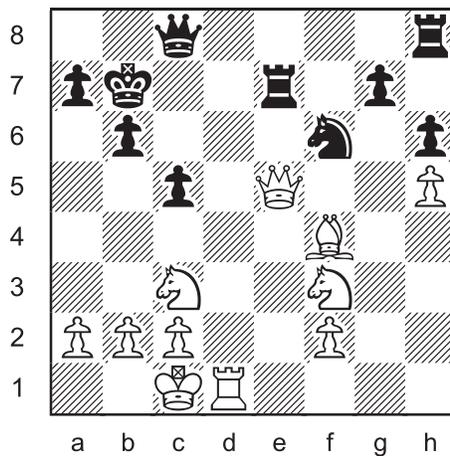
Cyclotron 68

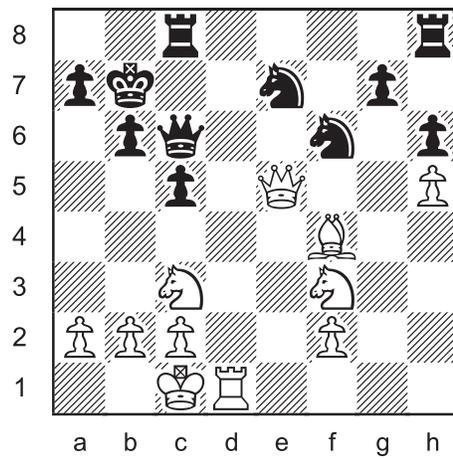Cycle three pieces so that Black is in checkmate.
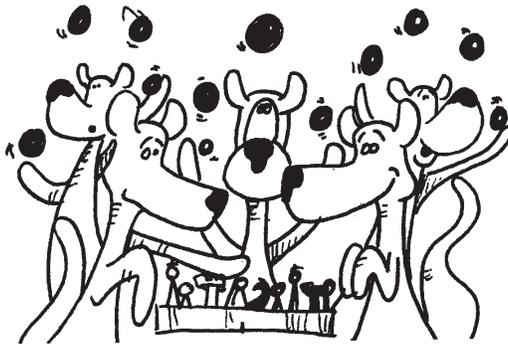
25,000 days is two billion seconds,
Two billion beats of the heart,
500 million breaths of air,
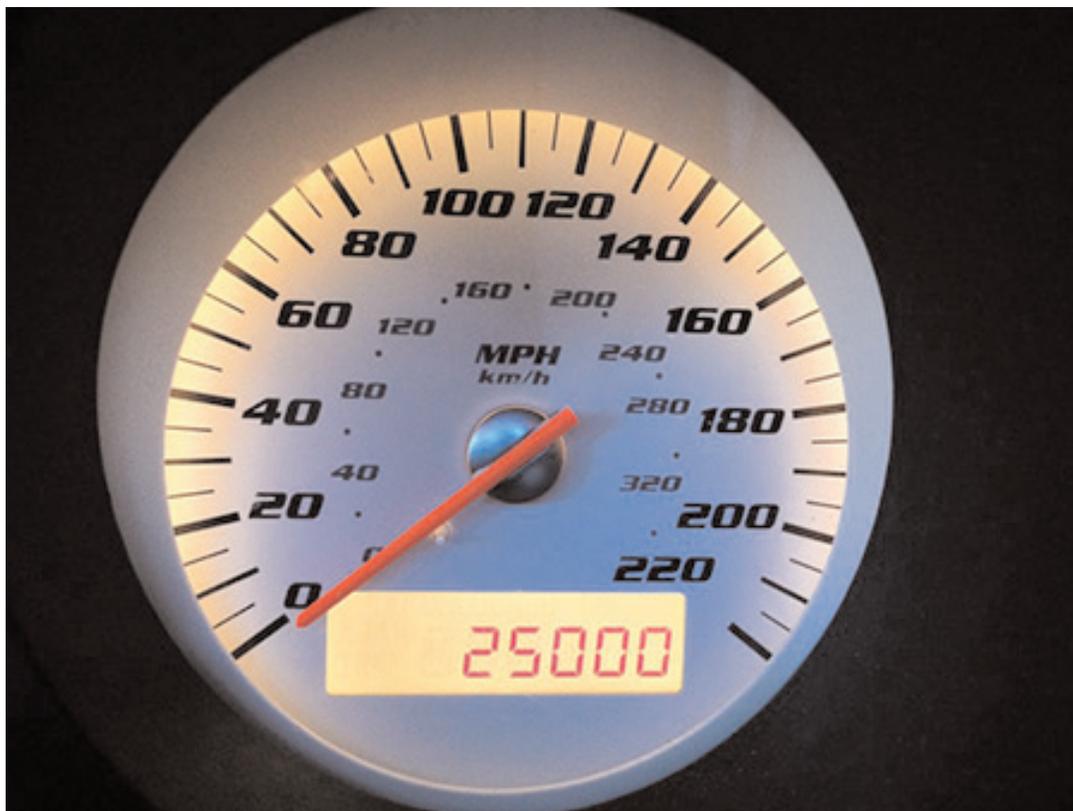300 million blinks of an eye.

Cyclotron 69

Cycle three pieces so that Black is in checkmate.

Cyclotron 70

Cycle three pieces so that
Black is in checkmate.

Milestones in Rotation

Stay tuned for more puzzles from the *Cyclotronic Side of Life*.

SOLUTIONS

All cyclotrons by J. Coakley. *Puzzling Side of Chess* (2019). Computer checked by the great Caisay 4.1 (Adrian Storisteanu).

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, 119, 126, 128, 130, 132). For more information on ordinary switcheroos, see column 4.
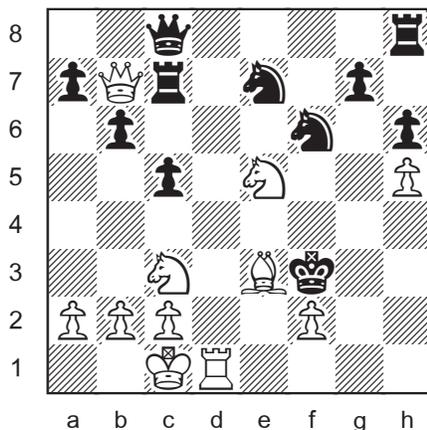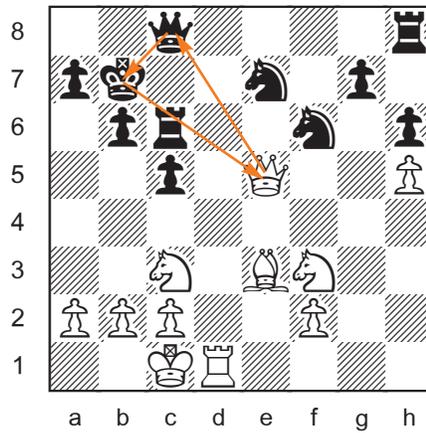
Cyclotron 65
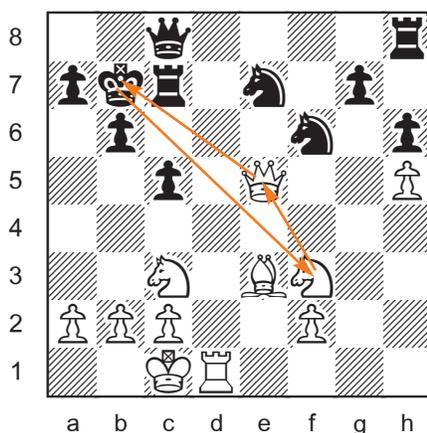
Kb7→f3   Nf3→e5   Qe5→b7

Double check and mate.

The order in which the pieces are cycled is not important. The resulting position will still be the same. See diagram below.
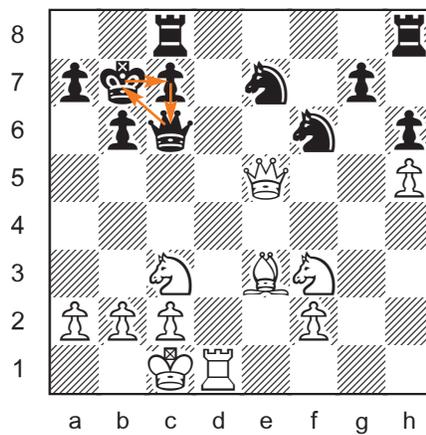
Cyclotron 66

Kb7→e5 Qe5→c8 Qc8→b7

The white queen shifts to cover e6 f5.

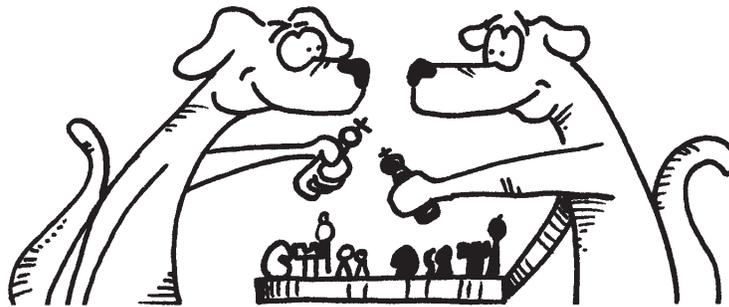## Cyclotron 67

Kb7→c7 c7→c6 Qc6→b7

Three adjacent pieces perform the smallest of cycles.
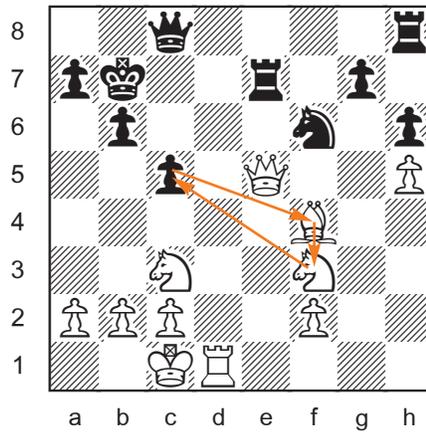
Cyclotron 68
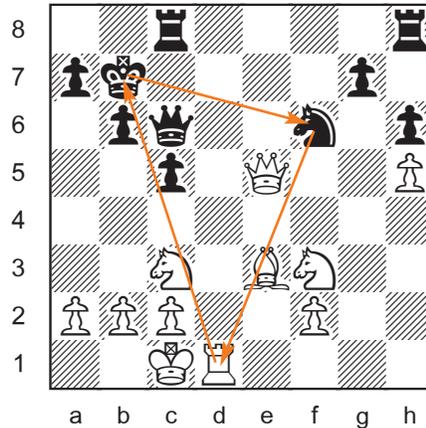
Kb7→f6 Nf6→d1 Rd1→b7

The white rook takes control of f7.

Cyclotronic Math

* To be precise, 25,000 days is 2,160,000,000 seconds.

* The distance around the globe along any parallel is equal to the circumference of the planet times the cosine of the latitude.
  For example, traversing the 40th parallel (through Philadelphia and the Mediterranean Sea).

  > equator = 40,000 kilometres (25,000 miles)
  > cosine of 40 degrees = .77
  > 40,000 x .77 = 30,800 km

* One thousand days is 2 years, 9 months. The time from conception to our second birthday.

* Mile Markers: 5000 days = 13 years, 8 months
  > 10,000 days = 27 years, 5 months
  > 14,610 days = 40 years
  > How many days are you?

Cyclotron 69

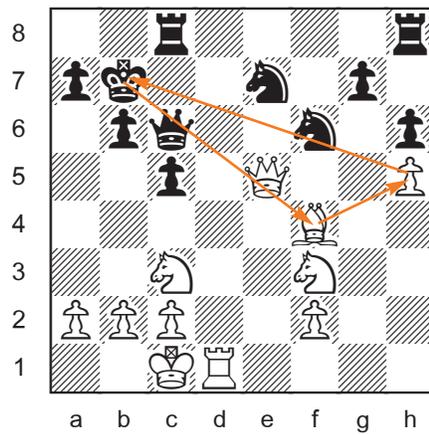c5→f4   Bf4→f3   Nf3→c5

The black king stays put this time.

The power of double check.

45 rpm

Cyclotron 70

Kb7→f4   Bf4→h5   h5→b7

Another king cycles to the end of the road.

Tricycle Man   *photo opportunity*

Until next time!