

Time Travel Chess

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1 From Future to Past

Here is an interesting chess variant: time travel chess! In addition to the usual legal moves, pieces and pawns from the future may enter the position. However, it is illegal to cause a time-travel contradiction: for every piece that **arrives from the future (in blue)**, a piece of the same kind will need to **depart to the past (in green)** later during the game. For example, in the initial position **1 ♖d1-d4*** is a legal move, the asterisk indicating that this Queen arrives from the future (giving White temporarily two queens). However, this obliges White to play **♗d1-d4**** at some later point in the game! The double asterisk indicates that this queen moves to the past and disappears from the board upon reaching d4. Failing to meet even one such obligation upon reaching the end of the game results in an automatic 0—1 loss. If both players fail to reach their obligations, the result is 0—0.

Note that it is even possible to checkmate the opponent and lose! For example,

1 ♖d1-f3*, ♘c6 **2 ♙f1-c4***, b6!? **3 ♙xf7#??**

while legal, loses the game, since checkmate ends the game, and White has not in fact played the moves **♖d1-f3**** and **♙f1-c4****. (Note that Fool's mate is not actually mate in Time Travel Chess, since White can block the check with a piece from the future).

A few more notes. It is allowable to use promoted pieces to fulfill prior obligations. However, *ex nihilo* loops are not allowed (e.g. playing **♖d1-d2*** in a ♔-vs-♔+♚ endgame and later—perhaps after conquering the enemy rook—fulfilling this obligation with **♖d1-d2**** by that very same queen). Note also that the departure square needs to be specified in advance, so playing **♗e2-f3**** instead of **♗d1-f3**** at a later point in the game to match **♖d1-f3*** is not allowed. Time travel captures are possible, but they need to be matched with the corresponding future capture! For example, if after 1 d4 black responds with 1 ..., **♜d8xd4*??** then white can never lose if she makes sure to keep d4 vacated at all times! After all, black will never be able to play **♜d8xd4****. The same holds for checks: e.g. **♖d1-h5+*** needs to be matched with **♖d1-h5+**** (and **♖d1xh5+*** with **♖d1xh5+****). We might call the principle by

which *-moves must be matched with similar types of **-moves—captures by captures, checks by checks—the *matching principle*.

1.1 A Note About Kings

Kings may time travel as well. But this is exceedingly risky, since both kings need to be shielded from check. An uncapturable fork immediately loses.

2 From Past to Future

Now, there is another direction of time travel as well: from past to future! Pieces may **disappear into the future (in pink)**, only to **reappear on their destination square (in yellow)** at a later point in the game—or not at all, having travelled sufficiently far into the future for the game to end before their return. In the latter case, we might require that their future arrival square is empty in the final position, so that they have a square to return to. We might call this the *vacancy principle*. (In fact, we might consider the *vacancy principle* to be a special case of the *matching principle* for pieces traveling to the future: here captures are allowed, but in the final position the arrival square needs to be occupied by the opponent—and checks need to be matched with checks.) Here are two example games, the first one impossible and the second self-defeating.

1 e4, f6 **2 ♖h5†**, g5 **3 ♗h5#††???**

is not allowed by the matching principle (hence the three question marks), since **2 ♖h5†** is not *truly* a check (whereas **2 ♖h5+** would have been).

1 e4, f6 **2 ♖h5†**, g5 3 ♗e2, ♘c6 4 ♗h5#??

loses the game for White, since h5 is occupied in the final position and thus the White queen will never be able to return to that square.

2.1 Another Note About Kings

Kings may travel to the future as well. But this, like all moves, must be a legal move.

2.2 A Note about Self-Capture

The matching principle requires captures to be matched with captures and self-captures with self-captures.

3 Full Time Travel

Full time travel means that time travel is allowed both from future to past and from past to future.