

Instructive Computer Games of Chess:
What we can learn from the beasts?

May 5, 2019

Chapter 1

Strategic Advantage

1.1 LCZero v0.21.1-nT40.T6.532 – Bluefish Dev

TCEC S15 Bonus: Bluefish vs Leela Jhorthos

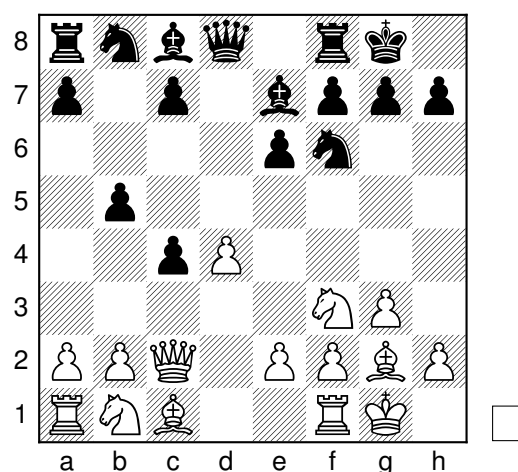
E05 CATALAN, OPEN, CLASSICAL LINE

2019-04-28

Following concepts exemplified:

1.

The engines started play from the usual start position.



Typical play here is 7... a6, instead. Trying to hold on to c4 allows white to get quite a lot of activity.

| | | |
|---|-----|------|
| 1 | d4 | ♘f6 |
| 2 | c4 | e6 |
| 3 | g3 | d5 |
| 4 | ♙g2 | ♙e7 |
| 5 | ♘f3 | O-O |
| 6 | O-O | dxc4 |
| 7 | ♙c2 | b5?! |

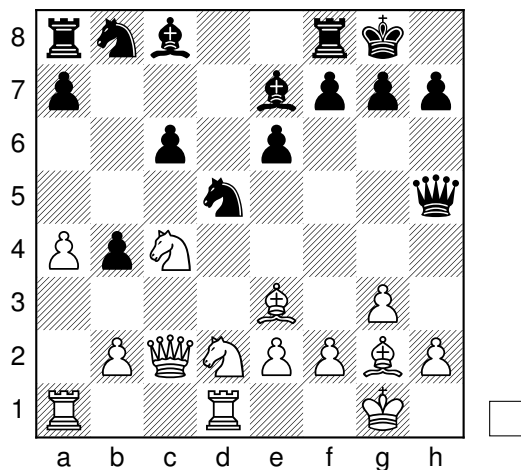
| | | |
|---|------|----|
| 8 | a4 | b4 |
| 9 | ♘fd2 | |

9. ♘bd2 slightly more popular, but 9. ♘fd2 has better statistics for white. The merit of the move in the game is that it unblocks the bishop's vision, adding pressure towards a8.

Black has here three options to protect the rook. 9... ♘d5 gives up the pawn back and allows black to develop the queenside. 9... b3 10. ♙xc4 ♙a6 11. ♙xb3 and either 11... c6 and black will get one pawn back, or 11... ♘d5 for trading one pawn for better development. A third and the most

popular option was played in the game, postponing the resolution of the queenside development.

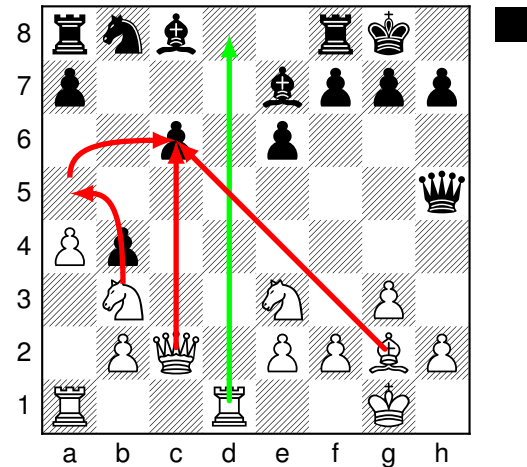
| | | |
|----|------|--------|
| 9 | ... | c6 |
| 10 | ♖xc4 | ♔xd4 |
| 11 | ♞d1 | ♔c5 |
| 12 | ♙e3 | ♔h5 |
| 13 | ♞bd2 | ♞d5!?N |



13... ♞g4 was the most popular move. This move has the merit over the played move that it effectively forces 14. ♞f3 or 14. ♞f1 in order to stop the mate threat, unless white decides to weaken the king-side pawn structure by h3 or h4. This deflects the knight from the d2 square.

13... ♞d5 would make more sense if the purpose was to block the g2-bishop eyeing towards the black's queen-side corner. However, the intention was to trade the knight with the bishop.

| | | |
|----|------|--------|
| 14 | ♞b3 | ♞xe3?! |
| 15 | ♞xe3 | |

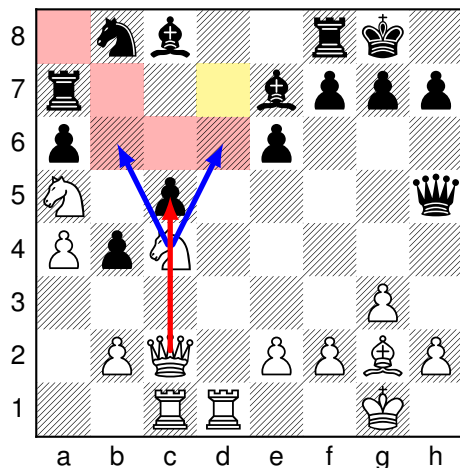


Now the small subtlety of playing 13... ♞d5 instead of 13... ♞g5 becomes obvious: black is going to have some serious questions to answer on developing the queen side, as the c6 pawn is starting to become a liability. Further, white has gained the d-file, thwarting development ideas such as ♙d7 with ♞a6 for now. So, black goes with another typical development idea in Catalan: push the a-pawn, play ♖a7, and then untangle with moves such as ♙g7 and c5.

| | | |
|----|-----|----|
| 15 | ... | a6 |
|----|-----|----|

Now move ♖a7 is enabled. The move 15... a6 over the move 15... a5 has the following two benefits: (1) The a-pawn will not become a target for a later ♞xa5, and (2) the pawn controls the b5 square after c5.

| | | |
|----|------|-----|
| 16 | ♞c4 | ♖a7 |
| 17 | ♖ac1 | c5 |
| 18 | ♞ba5 | |



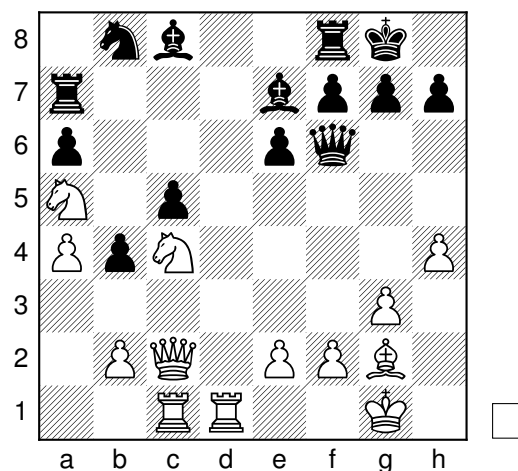
The b4-pawn is now finally protected, but black's problems are still far from over. The black queenside is a minefield due to white's control, and the d7-square is a bottleneck for black development. Further, should the e7-bishop move, white is ready to jump the c4-knight exposing the threat to take the c5-pawn.

Therefore, it is no wonder that it is already getting difficult to find any useful moves for black:

- (a) 18... ♖c7 does not help development, since the c6 square is already attacked twice by white. Similarly, a natural move 18... ♗g7 cannot be played.
- (b) 18... ♖g6 only asks white to make another developing move such as 19. ♖d3/e4/♗e4.
- (c) 18... ♖d1 allows white to practically force 19. ♖xd8+ ♗xd8 20. ♖d1 ♗xa5 21. ♗xa5 ♖g5 22. ♖d6 ♖c7 23. ♖d1 ♗d7 24. ♖c6 ♖xc6 25. ♗xc6. The 26... c4 move here would be met with 27. ♖d6 threatening to either win a piece by ♗e7+ or a pawn by ♖xb4 while still keeping black's queenside development cumbersome.
- (d) 18... ♗d7 with a possible continuation 19. b3 ♖c7 20. ♖d3 ♖d8 21. ♖e3 ♗e8 22. ♖f4 ♖cd7 23. ♖xd7 ♗xd7 24. e3 threatening ♖c7, for instance.

Black simply does not seem to be able to find any useful counterplay, so black decided to play a semi-waiting queen move, reinforcing the d8 square.

18 ... ♖g5
19 h4! ♖f6

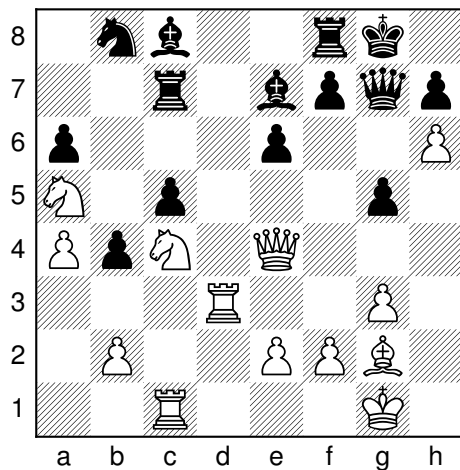


As black is unable to make progress, white is now starting to improve her position. The move h4 not only restricts the queen, but it also signals white's intention to shift the play in the king-side. Often such ideas are useful when one side has better access to squares.

20 ♖e4 ♖c7
21 ♖d3 g5

Black was soon forced to do something. If black would continue to play waiting moves, then white would soon break black's position. An example line 21... ♗h8 22 b3 ♗g8 23 ♖cd1 ♗h8 24 ♖f3 ♖h6 25 ♖e5 with unparriable threats. For example: 25... ♖d7 26. ♖fd3 ♖xd3 27. ♖xd3 ♖c1+ 28. ♗f1 ♗d7 29. ♖c7 ♗f6 30. ♗c6 a5 31. ♗a7 ♗a6 32. ♖xd7 with no hope for black.

22 h5! ♖g7
23 h6!!

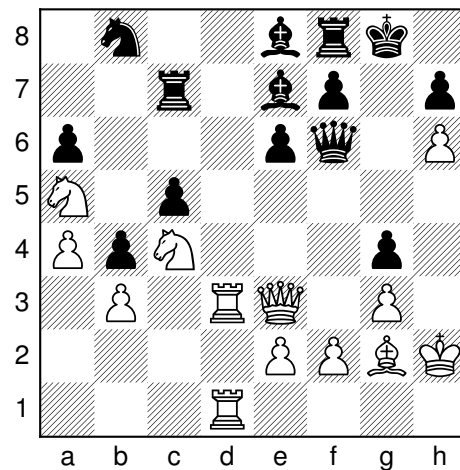


With the h-pawn moves, white continues to strangle black's position, and begins to threaten a king-side attack. Note that the h6-pawn cannot be taken as black queen must be ready to stop ♖e5, as that would win a piece due to the skewer (23... ♖e5 24. ♖e5 ♗d7 25. ♖xh6??).

23 ... ♖f6
24 b3

Solidifying move by white and preventing potential tactics by ... b3. Note that often with such moves, white needs to pay attention not to trap pieces, as b3 was the natural escape square for the a5-knight. However, here white could simply move the c4-knight somewhere to provide another escape square, should the need arise.

24 ... ♗d7
25 ♖e3 g4
26 ♗cd1 ♗e8
27 ♖h2



The king move is a subtle move in this complex position. Black is now almost in a Zugswang where it would be preferable not to make a move at all. The king move is also preparatory to avoid tempo loss by ♖h8/♗g8+ in some variations after both the g-pawns have moved to other files, as well as to prepare Rh1 to protect the h6-pawn with possible rook lift ideas. Finally, ♖h2 prepares ♖g3 to attack the g4-pawn should the opportunity arise. Let us review some of black's choices:

- (a) 27... ♖f5 would essentially transpose to the game continuation after 28. ♖f4
- (b) 27... ♖h8 28. ♗e5 ♖f5 29. ♖f4 ♖xh4 30. gxf4 and white maintains the advantage with a continuation such as 30... f6 31. ♗ec4 ♗g6 32. ♗d2 ♗g8 33. ♖g3 ♗f8 34. e3 ♗xh6 35. ♗d8 ♗e7 36. ♗b7 ♗xd8 37. ♗xd8+ ♗e8 38. ♗xe8+ ♗xe8 39. ♗xc5. Note that a move 29... ♖h5+ would not save the day, since 30. ♖g1 ♖f5 31. ♖xf5 exf5 would just leave white with a better pawn structure with otherwise similar prospects.
- (c) 27... ♗d7 28. ♗e5 ♗e8 29. ♗xg4 and white simply wins a free pawn.
- (d) 27... ♗a7 followed by, e.g., 28. ♖e4 ♖xh6+ 29. ♖g1 ♗c7 30. ♖xg4+ ♖g5 31. ♖xg5+ ♗xg5 32. ♗d6 and white gets a strong

foothold into black's territory, renewing the question on the queen-side weaknesses. Also, the exchange sacrifice after 28. ♖d6 ♕×d6 29. ♖×d6 ♖d8 30. ♖×d8 ♗×d8 31. ♗e5 f6 32. ♗×e6+ looks interesting with good compensation, although probably not necessary to take a risk.

(e) 27... ♖a7 28. ♘b7 ♗g5 29. ♗×g5+ ♕×g5 30. ♘×c5 ♖c7 31. ♘e4 ♕×h6 32. ♘f6+ ♔g7 33. ♘×e8+ ♖×e8 34. ♖d4 does not look very attractive, either.

None of the options look particularly good, so black went with the straightforward queen exchange.

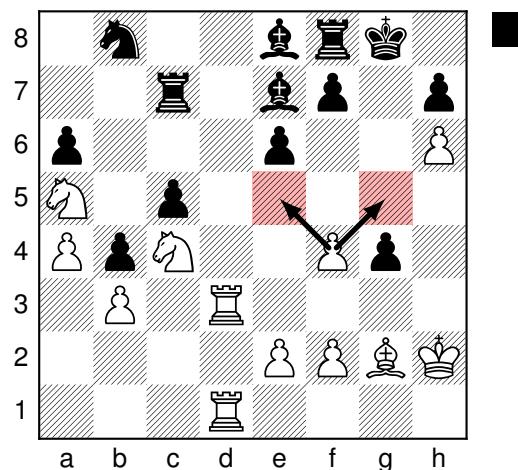
27 ... ♗g5
28 ♗f4!

White does not exchange the queen immediately, but forces better terms. The exchange on f4 square prevents black to get into the game, which 28 ♗×g5+ ♕×g5 29 ♖d6 ♕×h6 30 ♖b6 ♕d7 31 ♘e5 ♕g7 would have allowed.

28 ... ♗×f4

Black is forced to exchange the queens on white's terms. Note that curiously, black cannot make a waiting move 28... ♖c8 asking again to exchange the queens on the g5 square. The sequence after 29. ♗×g5 no longer works because the move ♕d7 is no longer possible because the rook had moved. Also, the intermediate queen check is no good either, because after 28... ♗h5+ 29 ♔g1 e5 30 ♘×e5 ♕g5 31 ♗f5 ♗×h6 32 ♘×g4 ♗g6 33 ♗e5 black simply drops a piece under white's threats.

29 g×f4



The pawn now controls two important squares: e5 provides an anchor point for a knight, and g5 protects indirectly the h6-pawn by preventing ♕g5.

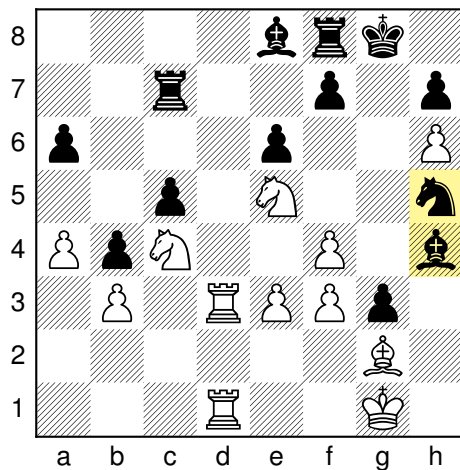
29 ... ♘d7
30 ♘c6 ♕h4
31 ♔g1

The threat was more important than the execution. Now its time to get back and protect the f2-pawn.

31 ... ♘f6
32 ♘6e5 ♘h5
33 e3 g3

Black is trying to create counterplay by trying to open the g-file and repositioning minor pieces in the h-file. However, white has a simple answer:

34 f3!



White simply makes black's own pawn a shield for the potential attack on the g-file, claiming that the pawn is rather weak. Now the black minor pieces on the h-file are irreparably mispositioned, and white can concentrate again on the queen-side. This time black has no answer to prevent white's penetration with the rooks.

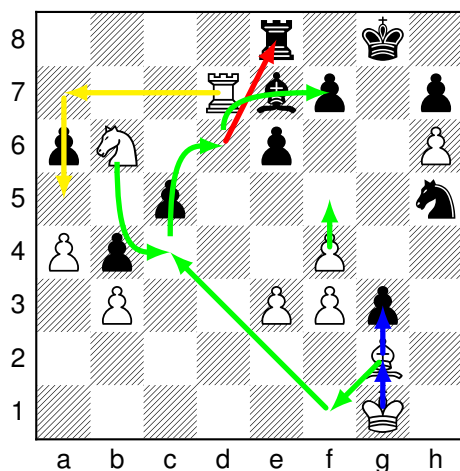
White has now multiple pieces for the plan to finish the game:

- (a) The rook can claim the a5-pawn, creating a passed pawn for white. The cost is some time. (Yellow arrows)
- (b) The king can march to g2 after the bishop has moved. Then, if the black knight moves, the g3 pawn can be taken. (Blue arrows)
- (c) The knight can move to d6 driving ♞e8 away, allowing the white rook to add additional pressure on f7. The bishop can reposition to c4, and the pawn can move to f5 adding even more pressure to the e6/f7 squares. This should allow white to create passed connected passers on e/f-files. (Green arrows)

Meanwhile, white's h6-pawn has now become weak and cannot be protected. Some precision is still required.

| | | |
|----|------|------|
| 34 | ... | ♙e7 |
| 35 | ♘d7! | ♙xd7 |
| 36 | ♖xd7 | ♖fc8 |
| 37 | ♘b6! | ♖xd7 |
| 38 | ♖xd7 | ♖e8 |

| | | |
|----|------|------|
| 39 | ♙f1 | ♘f6 |
| 40 | ♖b7 | ♘d5 |
| 41 | ♘c4 | ♙f8 |
| 42 | ♙g2 | ♙xh6 |
| 43 | ♙xg3 | |

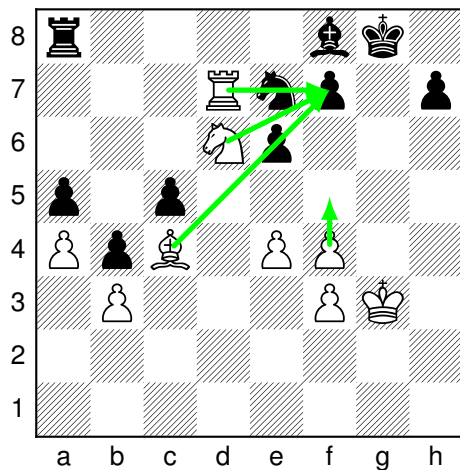


The king has now claimed the g3 pawn. Note that 40. ♖a7 would probably have been slightly more precise, although it does not matter.

| | | |
|----|-----|-----|
| 43 | ... | ♙f8 |
| 44 | e4 | ♘e7 |
| 45 | ♘d6 | ♖a8 |
| 46 | ♖d7 | |

A waiting move to ask black to move again, and to prevent the black to move ... ♖d8 with tempo on the knight.

| | | |
|----|-----|----|
| 46 | ... | a5 |
| 47 | ♙c4 | |



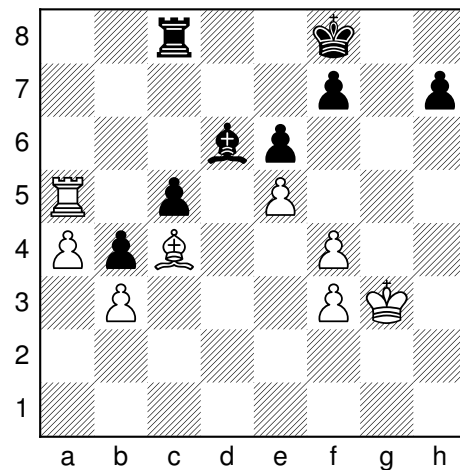
Now focusing on the f7 pawn with f4 pawn waiting to be moved.

47 ... ♖c8
48 ♖xc8 ♖xc8

The pawn move f5 is now temporarily discouraged due to tactics: 49 f5 ♖c7 50 ♖xc7 ♖d6+ 51 f4 ♖xc7. However, this would not be a disaster, since after 52. fxe6 fxe6 53. ♖xe6+ ♖g7 54. e5 the opposite-colored bishop ending would still be winning for white. White's connected passed pawns and white king's access to black's a-b-c pawns are strong enough to win the game. A bishop cannot usually stop attack on both sides of the board, since one side can deflect the bishop while the other side decides the game.

However, white did not go into such complications, and simply switched to taking the a5-pawn first and then resolving the pin by moving the e4-pawn before pushing the f-pawn.

49 ♖a7 ♖d6
50 ♖xa5 ♖f8
51 e5

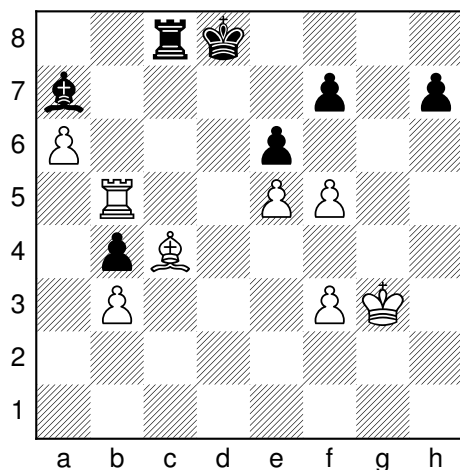


Black has no good squares for the bishop. ♖b8 would lose quickly to ♖a8 pinning, and then white pushing the a-pawn.

51...♖e7 would postpone the game by some moves with the following possible continuation: 52. ♖e7 52. ♖a7 ♖e8 53. ♖a6! ♖b8 54. ♖b5+ ♖f8 55. ♖c4. Note the move 53. ♖a6! . It drives the rook away from the c8-square, forcing ... ♖f8 after the check. The king cannot come to d8-square after ... ♖d8 since it's already occupied, or after ... ♖b8 since then white would play ♖b7+ with reveal check, winning the rook.

So, black sacrificed the c5-pawn in order to be able to block the a-pawn with a bishop.

51 ... ♖c7
52 ♖xc5 ♖e7
53 a5 ♖d8
54 a6 ♖b6
55 ♖b5 ♖a7
56 f5



White is now finally going after the f7-pawn. In opposite-color bishop endings, it is important to have two passed pawns with some distance to make it impossible for the bishop to stop both.

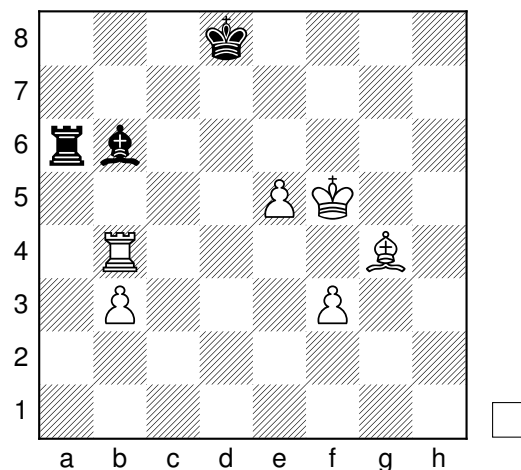
56 ... ♖b8
57 ♖a5

White could have also exchanged the rooks. The rest is simple technique.

57 ... e×f5
58 ♗×f7 ♗b6
59 ♖a2

The final pitfall was the natural-looking ♖b5. This would have blundered the win away to simple tactics: 59 ♖b5 ♗f2+ 60 ♗×f2 ♖×b5 with a disappointing draw. But now the rest is simple technique.

59 ... ♖c8
60 ♗f4 h5
61 ♗×f5 ♖c7
62 ♗×h5 ♖h7
63 ♗g4 ♖c7
64 ♖a4 ♖a7
65 ♖×b4 ♖×a6



A quick way to force mate would have been: 66 ♖a4 ♖a5 67 ♖×a5 ♗×a5 68 ♗e6 ♗e8 69 f4 ♗b4 70 f5 ♗f8 71 f6 ♗e1 72 ♗h5 ♗d2 73 ♗d5 ♗c3 74 b4 ♗×b4 75 e6 ♗a3 76 ♗c6 ♗e7 77 f×e7+ ♗×e7 78 ♗f7 ♗f6 79 ♗d6 ♗f5 80 e7 ♗e4 81 e8♖+ ♗d3 82 ♖e1 ♗c2 83 ♖e3 ♗b2 84 ♖d2+ ♗b1 85 ♗e6 ♗a1 86 ♖c1♯

However, in this game, Leela did not have the distance-to-zero (DTZ) tablebase files available and was on her own after reaching the winning position as per the win-draw-loss (WDL) files. As is characteristic to the current neural network (NN) engines, the endgame was not concluded quickly. The NN engines are simply interested in winning the game, not winning the game quickly.

66 f4 ♗c5 67 ♖c4 ♗f2 68 ♗e4 ♖g6 69 ♗f3 ♗h4 70 b4 ♖a6 71 ♗f5 ♗e1 72 b5 ♖a3+ 73 ♗g4 ♖g3+ 74 ♗h5 ♗a5 75 ♖a4 ♗b6 76 ♗g4 ♗e8 77 ♗g5 ♗d8+ 78 ♗f5 ♗b6 79 ♖a6 ♗f2 80 ♗h5+ ♗e7 81 ♖e6+ ♗d7 82 ♗e8+ ♗c7 83 ♖c6+ ♗b8 84 ♖c4 ♗a7 85 e6 ♖g7 86 ♗e5 ♗h4 87 f5 ♗e7 88 ♗g6 ♗f8 89 ♖c6 ♖b7 90 ♗f6 ♗e7+ 91 ♗g7 ♗a3+ 92 ♗h6 ♖×b5 93 f6 ♗f8+ 94 ♗h7 ♖b7+ 95 ♗f7 ♗a3 96 ♖c2 ♗b6 97 ♗g6 ♗b5 98 ♗e8+ ♗b6 99 ♗d7 ♖c7 100 ♖×c7 ♗×c7 101 ♗f7 ♗c5 102 e7 ♗×d7 103 e8♖+ ♗d6 104 ♗g8 ♗d5 105 ♖a8+ ♗d4 106 ♖c8 ♗b4 107 ♖d7+ ♗c3 108 ♖e8 ♗d4 109 ♖f7 ♗c3 110 ♖g7 ♗c5 111 ♖h8 ♗c4 112 ♖h7 ♗c3 113 ♖g7 ♗c4 114 ♖h8 ♗d4

115 ♖h7 ♗c5 116 ♖g6 ♗c3 117 ♖f7 ♗d6 118
 ♖e8 ♗c5 119 ♗g7 ♗d3 120 ♗g6 ♗d4 121 ♗f5
 ♗b4 122 f7 ♗c4 123 ♖g8 ♗b5 124 ♖c8 ♗c5
 125 ♖b8+ ♗c4 126 ♖a8 ♗b4 127 ♖a7 ♗d3
 128 ♖a6+ ♗d4 129 ♖a8 ♗c4 130 f8 ♗d3
 131 ♗g6 ♗d4 132 ♗f4 ♗e1 133 ♖a7+ ♗c4 134
 ♖b7 ♗c3 135 ♖c8+ ♗b3 136 ♖d7 ♗h8 137
 ♖e8 ♗c3 138 ♖f7+ ♗b4 139 ♖g8 ♗e1 140
 ♖h7 ♗d2 141 ♖g6 ♗c5 142 ♖e8 ♗d4 143 ♖f7
 ♗c3 144 ♖g8 ♗e1 145 ♖h7 ♗d2 146 ♖g6 ♗d4
 147 ♖e8 ♗c5 148 ♖a8 ♗e1 149 ♖a7+ ♗b5
 150 ♖b7+ ♗c4 151 ♖c7+ ♗b5 152 ♖d7+ ♗b4
 153 ♖e7+ ♗b3 154 ♖xe1 ♗c4 155 ♖e8 ♗c5
 156 ♖d8 ♗c4 157 ♖f8 ♗b5 158 ♖c8 ♗b6 159
 ♖d8+ ♗c5 160 ♖e8 ♗c4 161 ♖f7+ ♗b5 162
 ♖g7 ♗c6 163 ♖h7 ♗b5 164 ♖h6 ♗c5 165 ♖h5
 ♗d4 166 ♖h4 ♗c3 167 ♖h3+ ♗c2 168 ♖h8
 ♗b3 169 ♖b8+ ♗c4 170 ♖a8 ♗c3 171 ♖b7
 ♗d4 172 ♖a7+ ♗c3 173 ♖a6 ♗b4 174 ♖b6+
 ♗c4 175 ♖c7+ ♗b4 176 ♖d7 ♗c5 177 ♖e7+
 ♗c4 178 ♖d8 ♗c3 179 ♖d7 ♗c4 180 ♖e7 ♗c3
 181 ♗e5 ♗c4 182 ♗d6 ♗d4 183 ♖d8 ♗e4 184
 ♖f8 ♗d4 185 ♖c8 ♗e4 186 ♖d7 ♗xf4 187 ♖c8
 ♗e4 188 ♖d8 ♗f4 189 ♖b8 ♗e4 190 ♖a7 ♗f4
 191 ♖a6 ♗e4 192 ♖a5 ♗f4 193 ♖a4+ ♗e3 194
 ♖a8 ♗f4 195 ♗d5 ♗f5 196 ♖a7 ♗f6 197 ♖b7
 ♗f5 198 ♖b8 ♗f6 199 ♗d6 ♗f5 200 ♖a8 ♗f4
 201 ♗e6 ♗e3 202 ♗e5 ♗d3 203 ♖a7 ♗c3 204
 ♖b8 ♗c4 205 ♗d6 ♗d4 206 ♖e8 ♗c3 207 ♗c5
 ♗c2 208 ♗c4 ♗d2 209 ♖e7 ♗c1 210 ♗c3 ♗d1
 211 ♖e8 ♗c1 212 ♖e1#. White wins.

Chapter 2

Endgame techniques

2.1 Ethereal 10.88 – Lc0 17.11089

CCCC 1: Rapid Rumble (15|5)

Stage 1 Round 35

B90 NAJDORF, BYRNE (ENGLISH) ATTACK

2018-09-10

Following concepts exemplified:

1. Prying lines open with pawn-and-piece attacking pawn moves
2. The triangle of interception for pawn and king races
3. Blocking two pawns with a knight

The engines started play from the usual start position.

| | | |
|---|------|------|
| 1 | e4 | c5 |
| 2 | ♟f3 | d6 |
| 3 | d4 | cxd4 |
| 4 | ♟xd4 | ♟f6 |
| 5 | ♟c3 | a6 |

The popular Najdorf variation of the Sicilian defence.

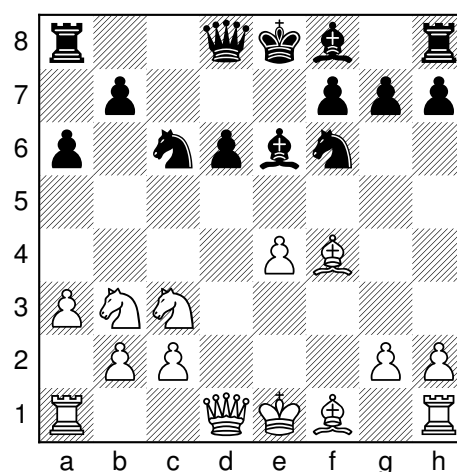
| | |
|---|-----|
| 6 | ♞e3 |
|---|-----|

The Byrne (English) attack.

| | | |
|---|-----|-----|
| 6 | ... | e5 |
| 7 | ♟b3 | ♞e6 |
| 8 | f4 | |

The first move to diverge from the mainlines. The move is not bad at all, but makes the game sharper than the most popular move, 8. f3.

| | | |
|----|-------|------|
| 8 | ... | e×f4 |
| 9 | ♞×f4 | ♟c6 |
| 10 | a3?!N | |



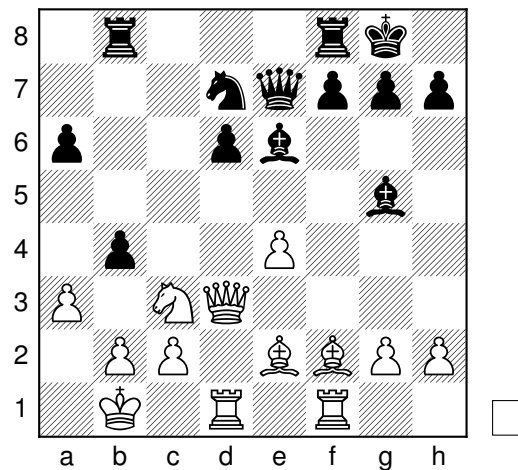
This is a novelty.¹ The main moves here are 10. ♞e2 and 10. ♞d2, preparing for long castling. This seemingly unnecessary move has some potential issues:

1. Black can play Bxb3 and white has to take with the c-pawn, instead of having the additional option to take with the a-pawn.

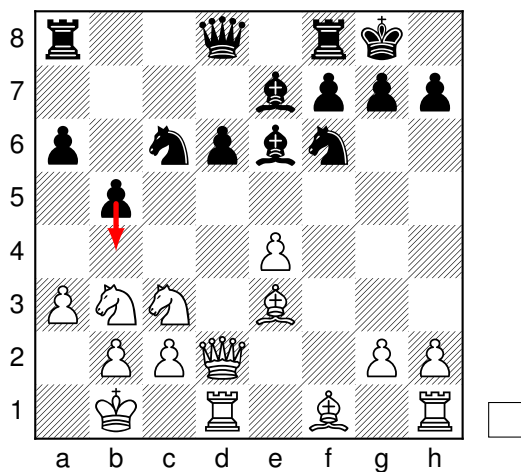
¹Lichess masters database, accessed Apr 2019.

2. Black has later additional options to open Q-side files by pushing the b-pawn.

| | | |
|----|-------|-----|
| 10 | ... | ♘e7 |
| 11 | ♔d2 | ♞h5 |
| 12 | ♘e3 | ♞f6 |
| 13 | O-O-O | O-O |
| 14 | ♞b1 | b5 |



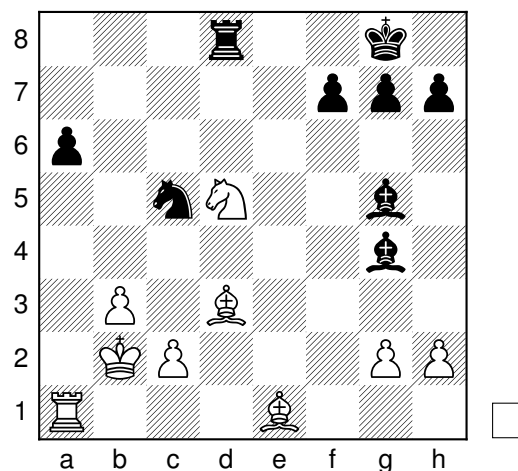
Now finally pushing b4. This is a typical attacking move to pry open files. If the knight moves, bxa3 will be played.



| | | |
|----|-------|------|
| 21 | axb4 | ♞xb4 |
| 22 | ♔xd6 | ♞fb8 |
| 23 | b3 | ♔d8 |
| 24 | ♞d5 | ♞xe4 |
| 25 | ♞fe1 | ♘f5 |
| 26 | ♞b2 | ♞c8 |
| 27 | ♘d3 | ♞xe1 |
| 28 | ♘xe1 | ♘g4 |
| 29 | ♞a1 | ♞c5 |
| 30 | ♔xd8+ | ♞xd8 |

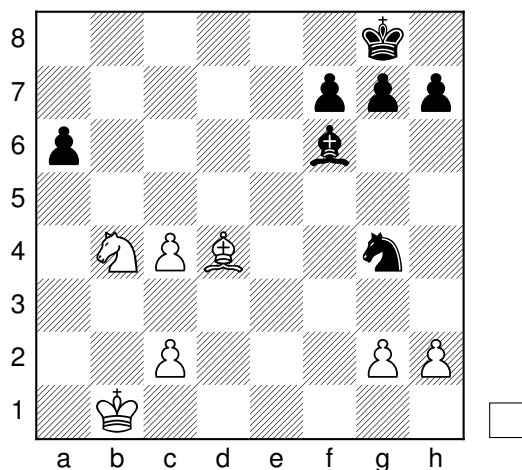
Now exercising black's typical Najdorf plan after opposite-side castling. The threat is now to push b4 and force axb4.

| | | |
|----|------|------|
| 15 | ♞d4 | ♞xd4 |
| 16 | ♘xd4 | ♞b8 |
| 17 | ♘e2 | ♞d7 |
| 18 | ♞hf1 | ♘g5 |
| 19 | ♔d3 | ♔e7 |
| 20 | ♘f2 | b4 |



White has managed to temper black's attack. The position is still somewhat complicated, but should be objectively a draw.

| | | |
|----|------|-------|
| 31 | ♙c4 | ♙e6 |
| 32 | ♖d1 | ♖d7 |
| 33 | ♙b4 | ♘e4 |
| 34 | ♚b1 | ♙d8 |
| 35 | ♖d4 | ♘f2 |
| 36 | ♙c5 | ♘g4 |
| 37 | ♘b4 | ♖xd4 |
| 38 | ♙xd4 | ♙xc4 |
| 39 | bxc4 | ♙f6?! |



This is a dubious-looking move, offering extra options for white to drive the endgame into a desirable direction. The game should still be a draw. Black had a number of other options, such as 39... ♘xh2 taking the pawn, 39... f5 hastening the pawn push, or 39... ♚f8 bringing the king to play. But since black played 39... ♙f6?! , white has at least three options to choose from:

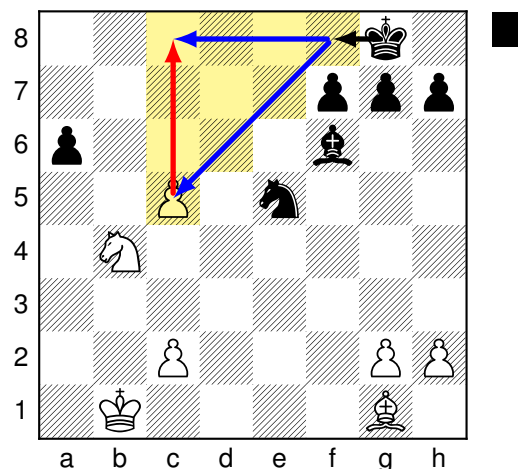
Option 1 — Deflect the knight from attacking h2, gaining a bit of time. 40 ♙xf6 ♘xf6.

Option 2 — Exchange the bishop for the knight, simplifying the position. 40 h3 ♙xd4 41 h×g4. While this position may look a bit weird at first, white's pawns are all in the light squares, untouchable by the black bishop, and white has double passed c-pawns while black's a-passer is weak.

But white decided to go with the third option: ♙g1. This move has multiple purposes: (1) it protects h2; (2) it protects the next square for the c4-pawn; and (3) it avoids exchanging pieces. The dark-square bishop alone cannot support the advancement of the c-pawn, and the knight alone is clumsy. But the bishop and the knight generally work well together to control squares on the way of the pawn. This was also the best choice for white.

| | | |
|----|-----|-----|
| 40 | ♙g1 | ♘e5 |
| 41 | c5 | |

Now is the time for black to play ♚f8. The black king needs to move in time to stop the c5 pawn. Highlighted is the triangle of interception where the king needs to be after black's move in order to win the race.

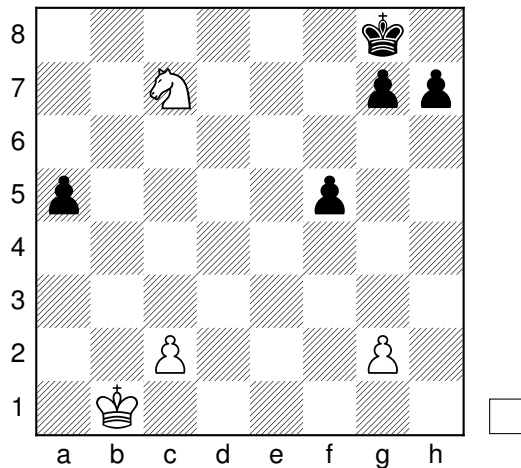


However, black did not play ♚f8 and black pieces alone cannot block or win the passed pawn. Preventing c8♖ will now cost a piece.

| | | |
|----|-----|------|
| 41 | ... | a5?? |
| 42 | c6 | ♙d8 |
| 43 | ♙d4 | ♙c7 |

Black at least gets now two pawns for the piece. Note that 43... a×b4 44 ♙×e5 ♚f8 45 c7 ♙×c7 46 ♙×c7 would have been even worse for black.

| | | |
|----|------|------|
| 44 | ♙×e5 | ♚×e5 |
| 45 | ♘a6 | ♚×h2 |
| 46 | c7 | ♚×c7 |
| 47 | ♘×c7 | f5 |



Here Leela thinks she is somewhat better with black, and this misevaluation was probably the reason why Leela played the losing ...41...a5?? move earlier. A beginning player might make a similar evaluation mistake.

The king-side black pawns surely look intimidating, but this is only superficial. If one does not calculate and/or spot the pattern to stop the king-side pawns, it is plausible to think that black has time to march the king to support the a5-pawn, block white's passed c-pawn, and overrun the king-side with the pawn wall. If white king intercepts this plan, surely the white knight and a pawn cannot stop the black pawn wall?

However, white has an easy plan. The g2 pawn guarantees that at least one black pawn will be exchanged when the black pawns march forward. If the knight is in time, it can stop two black pawns with ease with the L-shaped defensive pattern. In fact, white even has the time to take a small detour with the knight and take the a5, and then to blockade the king-side pawns.

When choosing the blockading squares for the knight, it is here beneficial to block the black pawns

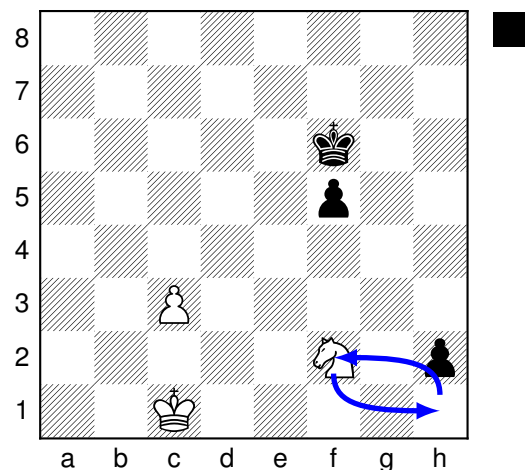
as late as possible, because that would require the black king to move beyond the c4 pawn for support, and then c4 pawn would have easy time to march forward and queen.

This plan is a forced win for white with the best but not difficult play.

| | | |
|----|------|------|
| 48 | ♘e6 | ♙f7 |
| 49 | ♘d8+ | ♙f6 |
| 50 | ♘b7 | a4 |
| 51 | ♘c5 | g5 |
| 52 | ♘×a4 | h5 |
| 53 | ♘c5 | h4 |
| 54 | ♙c1 | g4 |
| 55 | ♘d3 | h3 |
| 56 | g×h3 | g×h3 |

As promised, the g2 pawn was able to take one black pawn from the wall. Two pawns left for black.

| | | |
|----|-----|----|
| 57 | c3 | h2 |
| 58 | ♘f2 | |

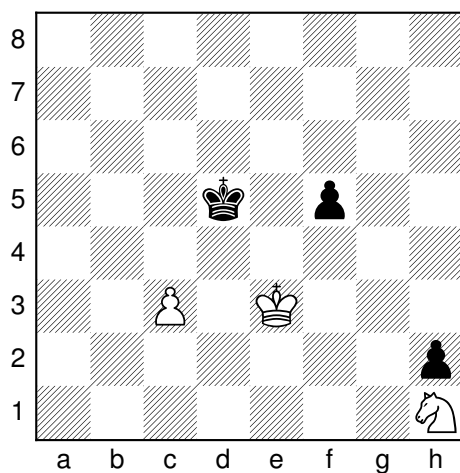


Now the knight controls the h1 and f2 squares and the black pawns cannot advance through those squares without support. However, the king cannot offer assistance, since the c4-pawn would run.

Further, it is important to note that the knight can jump freely between the h1 and f2 squares to lose tempi if necessary. Losing (or gaining) tempi

is often important in king-pawn endings, and this ending is not an exception. With only the white king and pawn versus black king, this would be an easy draw.

| | | |
|----|-----|-----|
| 58 | ... | ♔e5 |
| 59 | ♔d2 | ♔d5 |
| 60 | ♔d3 | ♔e5 |
| 61 | ♔e3 | ♔d5 |
| 62 | ♚h1 | |

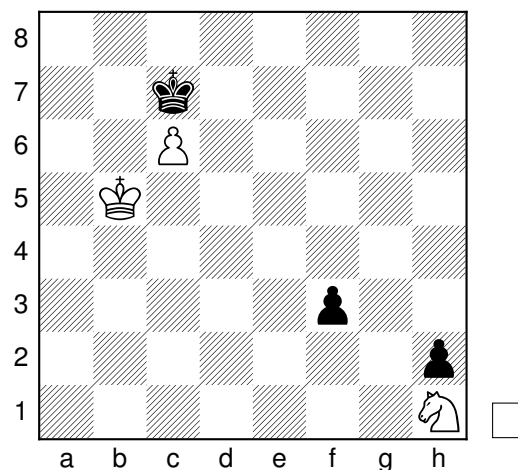


The first tempo loss, basically asking black to make another move. However, 62. ♔d3 and losing the tempo later was equally good.

Black has here one last attempt to trick a draw, although this variant was not played: 62... f4+ 63 ♔xf4?? ♔c4 64 ♔g3 ♔xc3 65 ♔xh2 draw. The correct move for white was 63. ♔d3! letting the knight to stop the f-pawn, and not allowing the king to stray away from the all-important c-pawn.

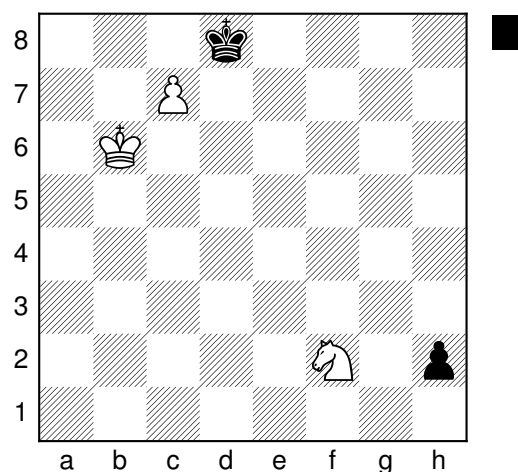
| | | |
|----|-----|-----|
| 62 | ... | ♔c4 |
| 63 | ♔d2 | ♔d5 |
| 64 | ♔d3 | f4 |
| 65 | c4+ | ♔c5 |
| 66 | ♔c3 | ♔d6 |
| 67 | ♔d4 | ♔d7 |
| 68 | c5 | ♔d8 |
| 69 | c6 | ♔c8 |
| 70 | ♔c5 | ♔c7 |

71 ♔b5 f3



Black does not want to move the king, as this allows white to push forward with ♔c6. But after the pawn moves are exhausted, black is out of options.

| | | |
|----|------|-----|
| 72 | ♔c5 | f2 |
| 73 | ♚xf2 | ♔c8 |
| 74 | ♔b6 | ♔d8 |
| 75 | c7+ | |



Without the knight and black pawn, ♔c8 would be a draw, since the only way (♔c6) white can protect the pawn would lead in a stalemate. But here white can always lose a tempo with a knight

move, and ask black to make another move. So, black simply gives up.

| | | |
|----|-------|-----|
| 75 | ... | ♔d7 |
| 76 | ♔b7 | ♔e6 |
| 77 | c8♚+ | ♔e5 |
| 78 | ♚h3 | ♔f4 |
| 79 | ♚xh2+ | ♔f3 |
| 80 | ♚h3+ | |

Final note. Ethereal follows the quickest distance to zero in tablebase win positions. 80. ♔c6 would have delivered the mate one move earlier.

| | | |
|----|------|------|
| 80 | ... | ♔xf2 |
| 81 | ♔b6 | ♔e2 |
| 82 | ♔c5 | ♔f2 |
| 83 | ♔d4 | ♔g1 |
| 84 | ♔d3 | ♔f2 |
| 85 | ♚g4 | ♔f1 |
| 86 | ♔e3 | ♔e1 |
| 87 | ♚g1# | |

White wins.