Othello: An Introduction to Strategy and Tactics

by Colin Springer

I. The Game.

Othello (also called Reversi) is played on an 8x8 board using 64 2-sided discs: white on one side, black on the other. Two players take turns moving, with black playing first.

The standard initial setup is shown below (figure 1). Note the standard coordinatization of the board: unlike chess, the rows are labelled from top to bottom.

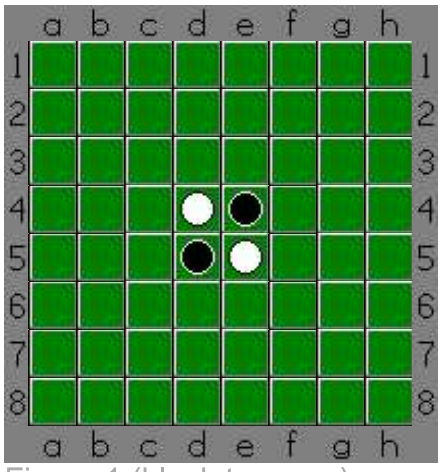

Figure 1 (black to move)

A move consists of placing a disc (your side up) on the board in such a way that it "flanks" a series of your opponent's discs in one or more directions.

For example, in the initial board position, black's legal moves are d3, c4, f5, e6. f6 is not a legal move since there is no black disc on c3 to flank the white discs at e5 and d4.

Now consider the position below (figure 2) with white to move:

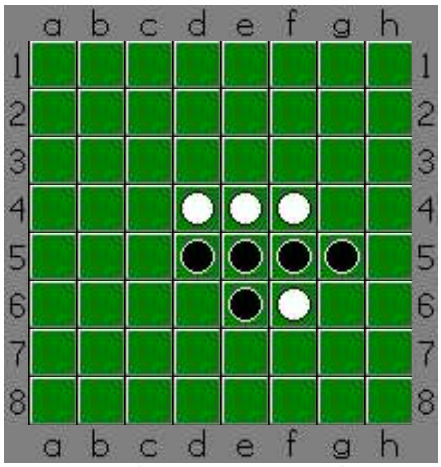

Figure 2 (white to move)

Here white might play e7 (flipping discs at e5 and e6 to white) or to d6 (flipping d5, e5, e6), among other possibilities.

If it happens that one player has no legal move, (s)he must "pass", allowing the other player to move again. The game ends when neither player has a legal move (ie. after two "passes"). Usually this occurs when all 64 squares have been filled, but in some cases there will be empty squares to which neither player can legally play.

When the game has ended, the winner is determined by adding up each player's discs -- the player with the most discs at this point is declared the winner. Note that it is possible for the game to end in a draw.

II. Basic Strategies.

2.1. Stable discs.

The ultimate goal of othello being to end up with as many discs as possible, many players deduce that one should flip as many discs as possible at each move in the hope of ending up with as many as possible. As we shall discuss later, this intuitive strategy is in fact among the worst possible in most situations. Nevertheless, certain discs are "stable" in the sense that they cannot under any circumstances be flipped by your opponent -- obtaining these discs is usually a good idea.

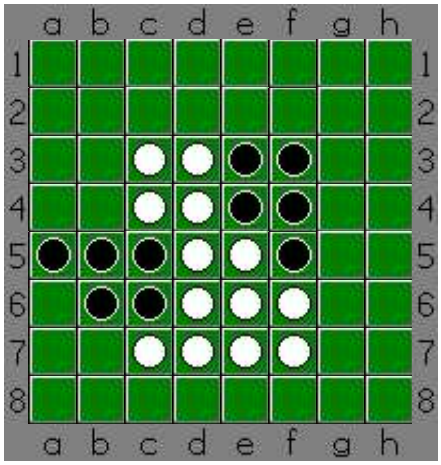

Figure 3 (white to move)

In figure 3 above, for example, white should avoid playing b7, since this allows black to respond with a8 (figure 4).

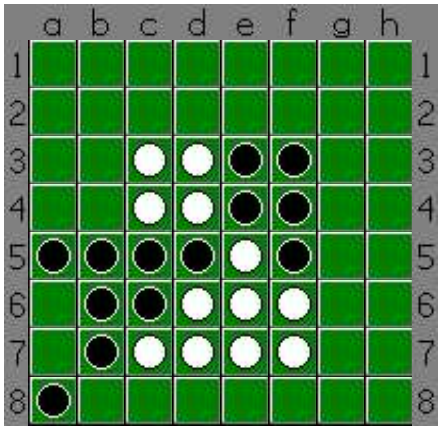

Figure 4 (white to move)

Now black has control of the game ... (s)he has the corner disc at a8, which white can never flip back. In addition, by playing subsequently to b8, c8, d8 and so on, black can stabilize much of the south edge.

This example illustrates the dangers of playing the so-called "X-squares": those such as b2, g2, b7, g7 which are diagonally opposite to a corner. If your opponent is able to capture the corner (either immediately or eventually) your position will often be inferior. This is NOT a rule written in stone -- as we shall see later, under many situations playing an X-square is in fact the best available move, and can drastically turn the tide of a close game. However, good players rarely play to an X-square before move 30 or 40.

2.2. Controlling the Game.

Given our realization that possession of corners is usually a good thing, how do we go about forcing our opponent to give us a corner? This is the most important strategy consideration in othello, referred to as Mobility. The idea is to limit your opponent's moves while maximizing your own. Often this will eventually lead to a situation in which your opponent is forced (by lack of any other moves) to make a disasterous corner sacrifice.

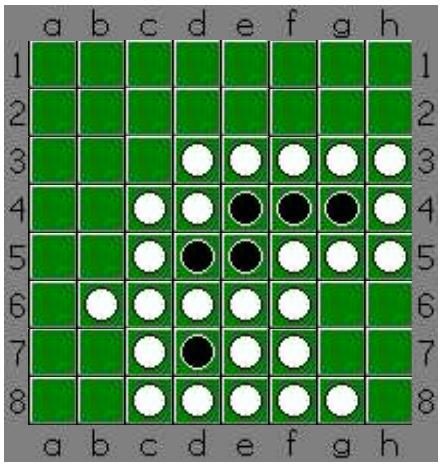

Figure 5 (black to move)

In figure 5, for example, black has succeeded in totally eliminating white's mobility. How should (s)he exploit this? The answer is in the move h6. Now white has two legal moves, g6 and h7. If white takes h7, black should play g6 (figure 6).

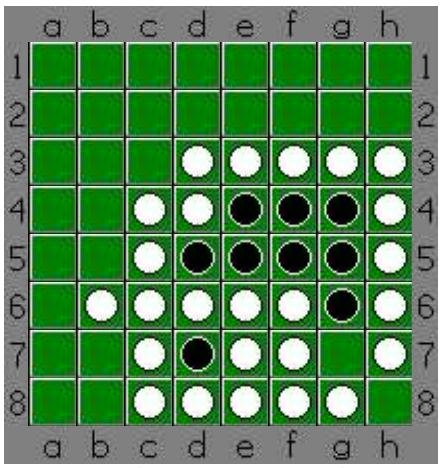

Figure 6 (white to move)

Now white's only legal move is g7, giving black h8 and a clear win. The consequences of white's h7 move were so terrible, that it appears the other move (g6) must have been better. But after black's move h2, white must play g2 and after black's move h7, white must play g7! (figure 7).

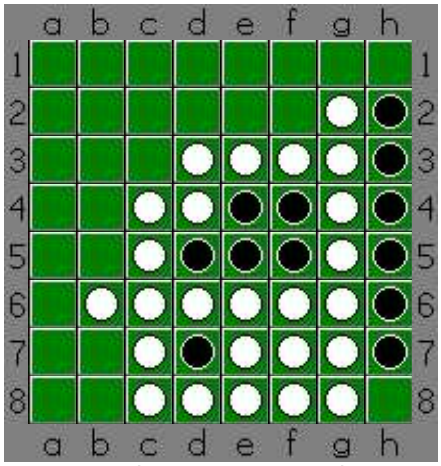

Figure 7 (black to move)

Again, white's position is hopeless ... black takes h8 with another clear win.

2.3. How to Gain Control (part 1) -- Disc Minimization.

The example above clearly shows the disasterous consequences of losing control of the game. By playing in a manner to limit white's mobility above, black ended up in a clearly winning situation. But what did white do wrong? And how did black arrive at such a desirable position? Let's look at figure 5 again ...

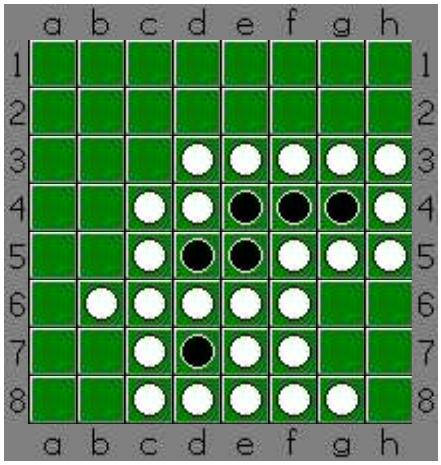

Figure 5 (black to move) (repeated)

One obvious feature of this position is that black has only 6 discs compared to white's 25. Most novices would look at the situation in figure 5 and immediately assume that white is winning, since the goal in othello is to end up with as many discs as possible. However, we've just seen how wrong this is!

In fact, black is winning in large part BECAUSE white has too many discs. Because black has very few discs, white has very few moves (since (s)he must flip black discs to make a move). And as a result black is in a good position to sieze control of the game.

To summarize: in the midgame, the main strategy is to maximize the number of available moves, while minimizing your opponent's (black has 15 moves above, while white has none). Under most

circumstances, the player who has the fewest discs is winning. As a consequence, good othello players will often choose moves which flip as few discs as possible, preferably only one!

2.4. How to Gain Control (part 2) -- Centralize!, or Don't Build Walls!

Controlling a game involves more than just minimizing your discs. Disc minimization often works to increase your mobility, but this is not always the case!

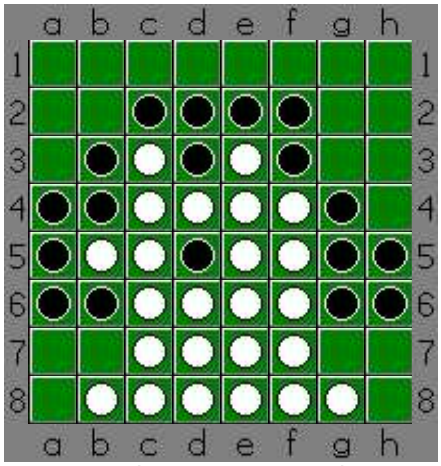

Figure 8 (black to move)

In figure 8, black has 18 discs to white's 24. So black should be winning! But this is clearly not the case ... black's only legal move is to play b7, giving up the a8 corner for white. So black's position above is quite hopeless.

Why is this? Again, the most important factor in the midgame of othello is mobility: here black has only one legal move while white has 16! Counting moves for each side is time-consuming in an actual game, so we need ways to approximate mobility. One is disc-minimization, as above. But possibly even more important is to avoid building walls.

Above, black's discs in the North region of the board totally block all possible moves there, while giving white a free choice! White's central discs, on the other hand, give black almost no moves while providing anchor discs for white's large variety of options.

Please forward comments/suggestions to me (Colin Springer): springer@math.umn.edu