NOTES on BRAND OTHELLO

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Brand Othello: can serve both as a strong Othello opponent as well as a tutorial aide.
These notes do not explain the rules of Othello. They simply give a brief summary of the several useful and flexible features of the Brand Othello program.

To make a move: simply click on the desired square.

Buttons

1. **Left arrow:** Takes back previous move. May be used to step back as far as the beginning of a game. Allows you to try a different move, if you feel you made a mistake.

2. **Right arrow:** Moves forward one move. Works in conjunction with left arrow button to allow you to move backwards and forwards to replay a sequence of moves or an entire game.

3. **Evaluate:** Clicking on this initiates a display of the search path that Brand uses to determine its next move. You can follow its selection of possible moves and the relative weights it assigns to them.

4. **To square:** To use this button, first click on it and then click on any occupied square. The board will immediately shift to the position existing when the move to that square was first made. Be careful not to click on an empty square on the game may "freeze."

5. **Options:** Clicking on this opens up a window that gives you several options, including starting a new game, whether to play Black or White, and the level of skill. Note that it plays extremely slow at the higher skill levels, and that tournament level cannot be selected.

6. **Legal moves:** Clicking on this results in a display of the locations of all your currently legal moves.

7. **Play:** The most common option - used when you wish to play against the computer.

8. **Enter moves:** Used when you wish to play against another human, or when

you simply wish to play out a sequence of moves.

9. **Enter stones:** To use this, first click on it and then click on any square (or set of squares) on the board. It will add (or remove) white (or black) disks to each square clicked on. This permits the set-up of any arbitrary position.

Note that you can switch between **Play, Enter moves, or Enter stones** at any time. Thus, for example, you can set up a position with **Enter stones** and then switch to **Play** to play against the computer from that point.

The File menu

This menu has some additional options, including the ability to **Save** games and print out **Transcripts** of games.

NOTES on OTHELLO/REVERSI

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The following is an excerpt from the book, **Othello: Brief & Basic** by Ted Landau, a 64 page Handbook on Othello strategy and tactics, complete with over 100 diagrams. This excerpt has been adapted for MacWrite - and thus does not represent the actual appearance of the Handbook (the real thing looks much better!). This excerpt covers the rules of Othello/Reversi as well as some very fundamental ideas about strategy. If you are interested in learning more, you may want to obtain the complete book. The book is a publication of the **United States Othello Association** (**USOA**), which also regularly publishes a magazine about Othello called **Othello Quarterly (OQ**) and holds tournaments throughout the year. For more information write to:

USOA
P.O. Box 342
Falls Church, VA 22046

Membership is $6.00 a year, which includes a subscription to **OQ**.
Othello: Brief & Basic costs $5.00 to members and $6.00 to non-members.
You may mail a check to the **USOA** for either or both of the above items.
For $11.00 you will get both a one-year membership and a copy of **Brief & Basic**.

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EXCERPT FROM: OTHELLO: BRIEF & BASIC

INTRODUCTION

Origins. The origins of the game of **Othello** remain uncertain, though its similarity to ancient Oriental games such as Go suggests that Othello may have similar roots. Othello's modern form emerged in England, in the late 1800's, when Lewis Waterman and John Mollett each separately claimed to have invented the game of **Reversi**. Though they each denounced the other as a fraud, they both probably derived their ideas from related pre-existing games. Reversi remained popular over the next 20 years and then seemed to fade from view. It resurfaced in Japan, in the early 1970's, when Goro Hasegawa claimed to "invent" Othello, a game identical to Reversi except for two minor differences in rules (see below). Othello became very popular during the 1970's, with an annual World Championship begun in 1977 and National Championships held in many countries, including the United States. The increase in interest in microcomputers in recent years has also contributed to a resurgence of interest in Othello/Reversi. This is because the nature of Othello (few rules, symmetrical board, one type of piece) lends itself to writing computer programs that can "play" the game. Dozens of programs, widely varying in quality, now exist that play Othello. Computer Othello tournaments are held periodically

throughout the world.

Equipment. Othello is played on a 8 x 8 board of 64 squares, similar to a chess board. The game pieces are sixty-four discs, black on one side and white on the other.

Object. The object of Othello is to end the game with the majority of discs on the board having your color facing up. Ties are possible.

Rules. A brief summary of the rules:

1. A game always begins with four discs placed as shown in Diagram 1. (This differs from the rules of Reversi, which allows for any position of the four central discs).
2. One player is assigned Black and always places his discs with the Black side up. The other player is White, and conversely places his discs with the White side up.
3. Black always goes first with Black and White alternating turns thereafter.
4. A **legal move** is defined as follows: a new disc is placed on a vacant square. This vacant square must be adjacent to at least one square already occupied by a disc of the opponent's color. This new disc must also be placed so that in at least one direction (vertically, horizontally, or diagonally) the newly-placed disc, together with a disc of the player's color already on the board, brackets (or "**outflanks**") one or more discs of the opponent's color. The bracketed disc(s) are turned over (or "**flipped**") to become the same color as the newly placed disc. If a newly-placed disc outflanks opponent's discs in several directions at once, all such discs are flipped. For example, all possible legal moves for Black's first turn are indicated with asterisks in Diagram 1 -- each choice would result in the flipping of one or the other of the two white disks. For an example of a move that flips more than one disc, turn to Diagram 4 for a moment. Here, a White move to d7 would flip 4 discs: d4, d5, and d6 vertically and e6 diagonally.
5. A player with no legal moves must "**pass**". For every turn in which a player must pass, his opponent continues to take turns, taking discs from the other player's "tray" as necessary. Thus, (unlike Reversi) a player cannot "run out" of discs.
6. A player may not pass if he has a legal move available.
7. If neither player has a legal move, the game ends even if there are still vacant squares on the board. Most often, the game ends when all 64 squares are filled.
8. Once placed on the board, a disc is never moved again, though it may be flipped repeatedly over the course of the game. A disc that currently has its white side facing up is called a white disc and vice versa.

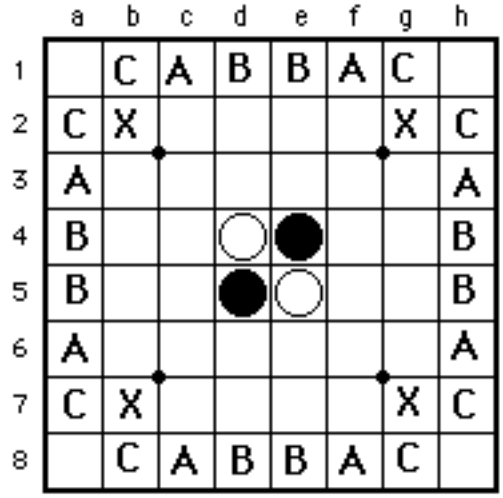

Diagram 1

Notation & Terminology. Diagram 1 introduces the basics of Othello notation, as used in the diagrams. Squares are typically referred to by the letter and number that corresponds to the square, as indicated along the borders of each diagram. Thus, the second square in the first row is called the b1 square. Some squares have additional names, as shown in Diagram 1. Thus, the b1 square is also referred to as a C-square.

STRATEGY & TACTICS: THE FIRST 3 (of 21) POINTS

Othello is a game of skill. Luck rarely, if ever, affects the outcome of a game. Othello is also a far more complex game than most casual players ever realize. The correct strategy and tactics are largely unknown to these players, even some who think they are quite accomplished and claim to "beat all of their friends". This is because the correct ideas are often counter-intuitive and therefore are difficult to discover without assistance. These 3 points begin to provide this assistance (see the complete **Othello: Brief & Basic** for the remaining points).

1. Get more stable discs, not just more discs

The object of Othello is to end the game with more discs than your opponent. This ultimate goal is frequently translated, by many beginning players, into an immediate goal throughout the game. That is, on each turn, a player will (with few exceptions) take the move that flips the maximum number of discs. This has been clearly shown to be an inferior strategy. Actually, disc count is often irrelevant to who is ahead in a game. This point can not be stated too strongly. In fact, players who consistently flip large numbers of discs early in the game are among the easiest opponents for experts to defeat! An example is in Diagram 2. Here, Black has only one disc on the board, with only four moves left in

the game. But if you play the game out, you will find that Black gets all the remaining moves and wins the game 40-24. Clearly, simply having a lot of discs, even at such a late point in the game, is not enough to assure victory. Even games between experts may end with this sort of turn-around in the last few moves (though usually not as dramatic as in this example). The reason this can happen is that White's disc majority was fragile, since many of his discs were vulnerable to being flipped by Black. The point therefore is not simply to acquire discs, but acquire discs that cannot be flipped for the rest of the game, no matter how the game develops. Such discs are called **stable discs**. Unfortunately, as we will see, stable discs usually cannot be acquired in any great number until the endgame. Therefore, the strategy for the majority of the game focuses on factors other than the relative disc counts of the two players. These are discussed in the next several points.

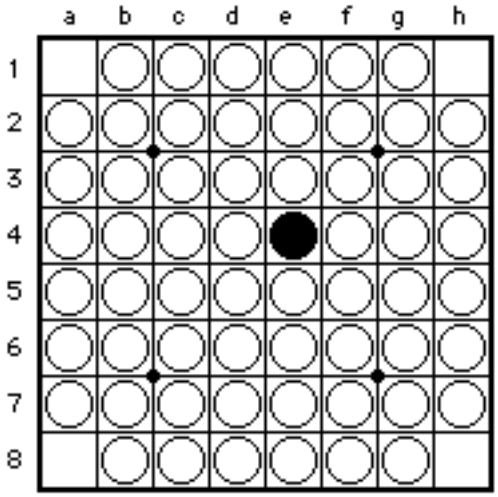

Diagram 2: Black to move

2. Not all squares were created equal

A crucial idea that beginning players inevitably realize is the importance of the 4 corner squares on the board. It was not coincidental that the 4 empty squares in Diagram 2 were all **corner squares**. A corner is important because it can never be flipped. That is, it is a stable disc. Similarly, possession of discs adjacent to a corner square (once the corner has been occupied) often means that the adjacent discs are stable as well. Thus in Diagram 3, when Black takes the h8 corner, all the discs in the g and h columns and in the seventh and eighth rows, suddenly become stable discs for Black. Black is well on the way to winning the game. In fact, possession of a corner is so critical in the beginning of the game, that getting one almost always assures victory. Similarly, since the corners and the edge squares together add up to 28 squares, it is almost impossible to win without occupying at least some of these squares.

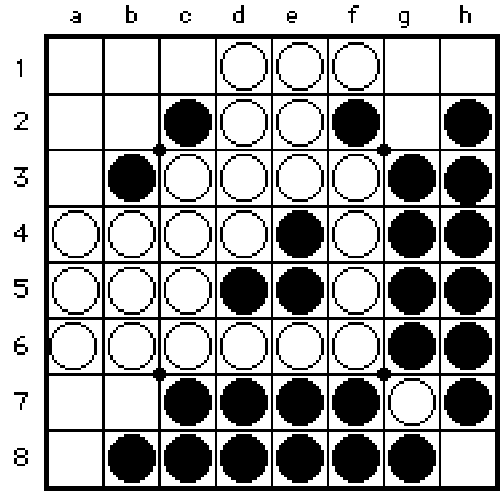

Diagram 3: Black to move

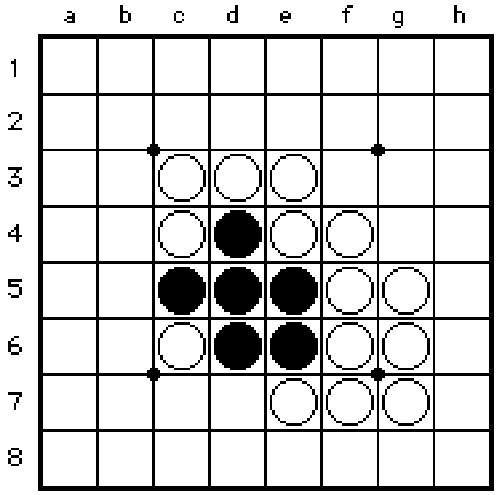

Diagram 4: White to move

An implied corollary to the above principles is that squares adjacent to corners are extremely risky to occupy, at least until the corner itself has been occupied. This is because these squares can become "stepping stones" for your opponent to take the corner. This is especially true of the **X-squares**. Taking an X-square early in the game, usually guarantees that the other player will get the adjacent corner. Such a situation is seen in Diagram 4. It is White's turn, but no matter where White goes, Black will be able to flip the disc on the X-square (g7) and take the h8 corner on his next move. Very simply, White should never have gone to the g7 square at this stage of the game. There are similar problems with C-squares, though they do not guarantee the opponent's access to the corner nearly as often as X-squares do.

An incorrect, though commonly assumed, implication of the above discussion is that all squares on the board can be rated as to their absolute value. In this approach the corners are typically rated as the most valuable, the A and B edge squares as valuable (but less so than corners), the non-edge squares as still less valuable, and the C- and X-squares as most risky. By this theory, the best move on each turn usually will be the move that occupies the highest rated square to which the player has a legal move. Unfortunately, a player adopting this strategy will almost always be defeated by a player using the winning strategies to be discussed in the next sections.

[Note: Corners often diminish in value near the end of the game, and corner sacrifices become quite common among expert players. In such situations, possession of only one corner may be sufficient to win the game. Similarly, occupation of C-squares and even X-squares may be crucial to winning the game.]

In summary, the incorrect strategies place an unwarranted value on flipping large numbers of discs even though they are not stable and on possessing the A and B edge squares. Ironically, the correct strategy typically involves flipping a minimum number of discs and often avoiding the non-corner edge squares, at least until later in the game.

3. Control of the Game: Mobility Optimization and Dynamic Square Evaluation

Once understood, the logic of the correct strategy to winning Othello seems quite

straightforward. Your hope is to get your opponent to make a poor move that will allow you to win the game (e.g. get early access to a corner etc.). Obviously, your opponent, especially if he is a skilled player, is not likely to make such a move willingly. Your goal, therefore is to force him to make a poor move. How can this be accomplished? Quite simply, if your opponent has only very few (ideally just one or two) legal moves, and they are poor moves, then your opponent will be required (by the rules of the game) to make a poor move. In the extreme case, where your opponent has only one move, he is said to have a **forced move**. An example is given in Diagram 5. Here, Black wisely chooses to go to e8. The wisdom of Black's move quickly becomes evident: White now has only one move, to b2, which will allow Black to get the a1 corner and inevitably win the game. A more subtle example of the same principle is in Diagram 6. Here, if Black moves to g6(!), White is again forced to the b2 X-square. Note that any other move for Black (e.g. f6, g5) opens up new moves for White, thus eliminating the forced move to b2.

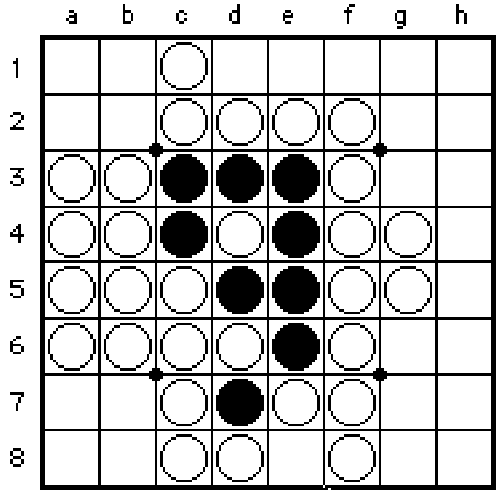

Diagram 5: Black to move

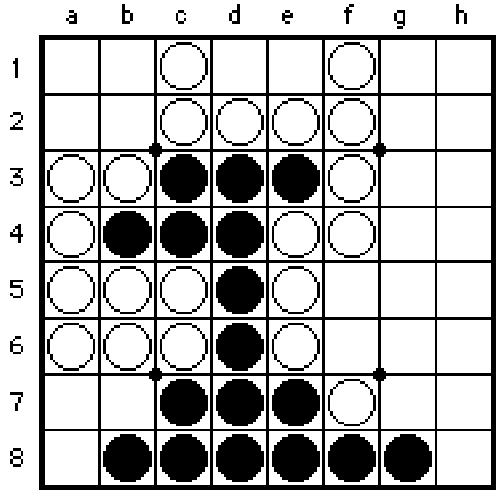

Diagram 6: Black to move

In more general terms, your goal is **move limitation**, or limiting the number of moves (often referred to as options) that your opponent has. At the same time you wish to maximize your own options. Overall, this is referred to as **mobility optimization**. This is when you have many options, at least some of them good ones, while your opponent has few options, all of them poor. At this point you have **gained control** of the game. If you can continue to maintain such control, you will almost certainly win. Another example of the power of this approach is demonstrated in Diagrams 7 and 8. In both of these diagrams, Black is contemplating a move to f8 (an A square). In Diagram 7, such a move would be a disaster. It flips the whole f column to Black, and after a White move to a2, Black would be forced to go to either b2 or b7 (X-squares) on his next move, losing either the a1 or a8 corner. Contrast this to the move to f8 in Diagram 8. Here, the move does not open up any new moves for White, while it retains the g8 option for Black. It is an excellent move in terms of mobility optimization. In fact, after White-a2, Black-g8, it is now White who will lose a corner! The point of all this is that the value of f8 (or any square) is never an absolute. It is always a function of the current overall board position. If this is taken in to account properly, then an attempt to rate the relative (and changing) values of squares is possible and useful. This is referred to as **dynamic square evaluation**. Together with mobility optimization, it forms the heart of basic Othello strategy.

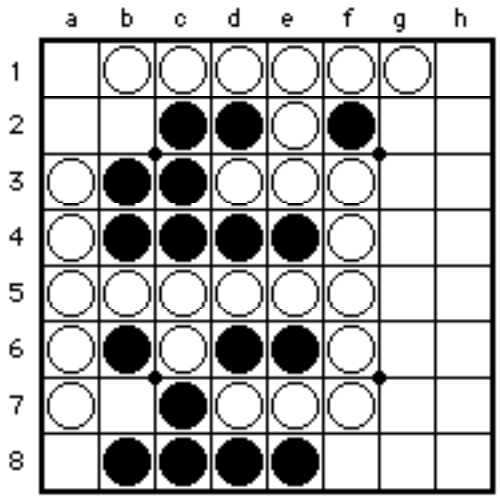

Diagram 7: Black to move

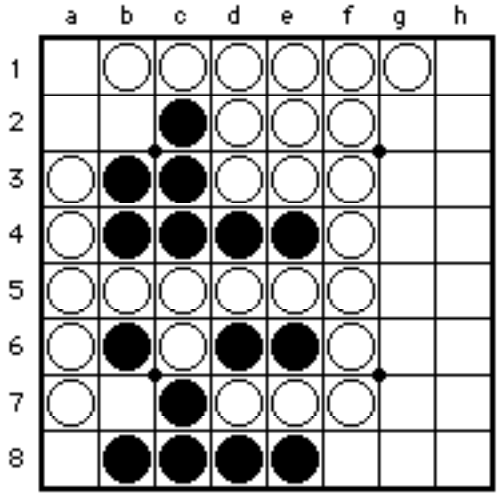

Diagram 8: Black to move