

# Under the Strategy Tree

## Robert Abbott, Logic Mazes

This article presents Robert Abbott's musings on the concept of clarity, as they occurred to him while inventing his game *Epaminondas*. It was first published in *Games & Puzzles* magazine in 1975 [1], then reposted by Abbott in 2006 on his own web site with an important addendum [2].

### 1 Introduction

LETTING a game inventor write about his own game is not quite the same as letting an author review his own book. Self-review may not be respectable in an established art form like the novel, but it does have a long tradition in art forms struggling for acceptance. The most recent examples are the underground film-makers of the sixties who reviewed their own works, and the 'happenings' and other art events that were usually accompanied by polemics from the creators explaining what they were doing. Even though games are as old as any art form (in fact, it makes more sense to say that art is a game form than that games are an art form), games are not generally accepted as worthy of critical study (except maybe as simulations or mathematical models). Thus it is fortunate that game inventors have the pages of *Games & Puzzles* to explain why their games are good and why they are important.

*Epaminondas* is my latest game [3], and it has just been published by Philmar Ltd.<sup>1</sup> A brief description of the rules is given below. I will not actually review the game (I will even forgo explaining why it is called *Epaminondas*), except I will say it has great *clarity*. I wanted to devote the major portion of this article to a discussion of clarity, a concept I came to understand while working on *Epaminondas*.

Clarity is essentially the ease with which a player can see what is going on in a game. It is a useful idea for a game inventor to keep in mind during the development of a game, and it is useful in the criticism of games. Most important, it explains what makes a game *deep*.

A lot has been written about the 'depth' of games like Chess and Go without anyone really explaining what depth is. Most people assume that depth can be explained purely in terms of logic or game theory. This is not true. If you look at games only in terms of the size of their strategy trees, it turns out that any perfect-information, non-chance game is complex enough to be beyond complete human understanding – thus in this sense all these games have equal depth.

*Epaminondas* is played on a  $12 \times 14$  square grid, initially set up as shown. [These rules are condensed from Abbott's original description.]

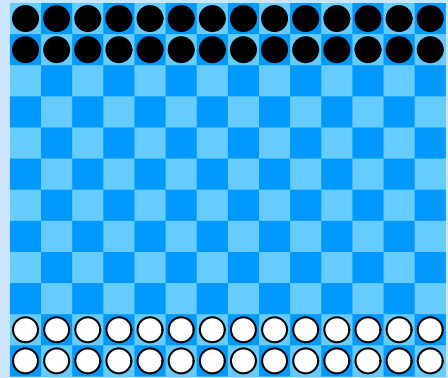


Figure 1. *Epaminondas* starting position.

Two players take turns, moving either one of their pieces a space in any direction or a line of their adjacent pieces (called a *phalanx*). A phalanx is moved as a unit, any number of spaces up to a maximum equal to the number of pieces moved, along the direction of its line.

Captures occur when a phalanx encounters an enemy phalanx or piece. The phalanx stops at the first enemy piece encountered, and captures that piece and all adjacent enemy pieces behind it, as long as the phalanx thus captured is smaller than the capturing phalanx.

The object of the game is to advance pieces across the board. When a player reaches the farthest row, the opponent must immediately capture that piece (or another on that row) or move one of their own pieces onto their own farthest row. If the opponent cannot do this, the player has won.

I am excluding here any games that have a known perfect strategy or games that are over in a few moves. What I mean is, if you go far enough down the strategy tree (say about ten moves, which is normally farther than a human can see)

<sup>1</sup>And more recently re-published by Nestorgames: <http://www.logicmazes.com/games/epam.html>