An Abalone Position For Which the Game is Undefined

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February 3, 1992

Abstract

We present an Abalone position for which there is no defined outcome.

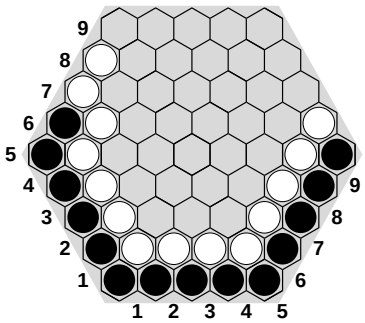
Introduction

Abalone is a cool game. We think you will enjoy learning about its many intricacies and coolnesses. We are particularly interested in certain positions of the game in which one player is unable to make a legal move. We have found such positions which use some, most, and all of the marbles. These are positions which can be arrived at by a sequence of legal moves from the start of the game. Once in any of these positions, one player is unable to move, yet there is no defined "pass" or "sacrifice" move in the game. We are forced to conclude that there is in fact no definition in the game's rules for what should happen.

Our Discovery

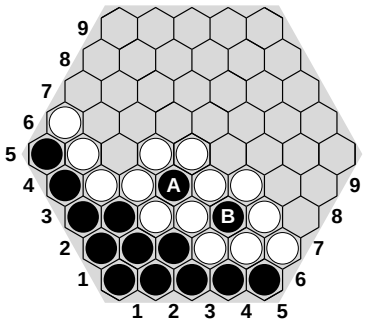
We have found several positions for which the game of Abalone, as described by its author, is undefined. One of them is illustrated below.

This is the first such position we came up with. It uses marbles all around the edge of the board. We wondered for some time whether there were any other similar positions. This inquiry generated the work presented herein.



Black to move

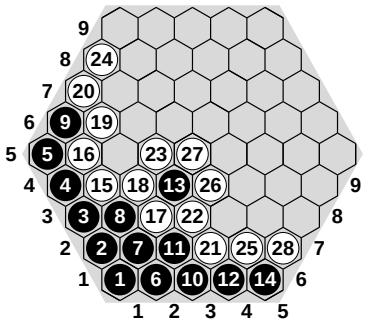
Next, we illustrate another position we discovered on our quest.



Black to move

In this position, you will see that balls **A** and **B** are isolated from the other balls of their color. This isolation turns out to be an important positional concept in the game, as well as key and useful for generating these problematic positions.

Finally, a third position.



Black to move

Here is a third position. In this position, notice that ball 13 is surrounded and isolated from the other black balls. None of the other balls in this position is isolated from the other balls of its color.

We hope you have enjoyed this. We know that we have! We look forward to the next opportunity we have to speak to you about *Abalone*!