(AGA Webmaster Roy Laird received the following letter in response to an article about 5x5 Go that appeared in the 12/21/05 edition of the American Go E-Journal, available at the E-Journal archive at http://www.usgo.org/EJournal/archive/EJarchive.asp.)

23 February 2005

Roy,

Thank you for your reporting on "5x5 Go Solved?" in the latest E-Journal.

As Van Der Werf's website mentions, "solving" 5x5 Go really only needs to show that after Black plays on the center point, White cannot live. That White cannot live is simple enough that a proof should be doable by hand.

After showing that White cannot live, the analysis can stop, because no other Black move can do any better. Van Der Werf's major accomplishment is the optimal analysis when Black does NOT play on the center point.

But the real reason I'm replying is that solving some boards smaller than 5x5 are in a very real sense harder than solving the 5x5.

For example, I have no doubt that a 1 kyu player on a 5x5 board would play on the center point and then always be able to kill White. However, I am quite sure that at least some of those same players would not play perfectly on a 2x2 board!

The reason is that White can easily prevent Black from making life, i.e., a stone on each of two diagonal corner points.

Furthermore, White can throw the game into confusion, by forcing Black to capture all the White stones, after which White can retake the Black stones. The only way for Black to win is to take advantage of the Super Ko rules in which neither side can re-create the same board position with the same player to move.

Here is what I believe to be the 2x2's minimal optimal game tree, which results in a one point win for Black. Black always wins below by forcing White into situations with no legal White moves. So White must pass, after which Black passes and the game ends with two Black stones and one White stone on the board.

You have to view this game tree with a fixed width font:

```
. .  Unique first move (ignoring symmetry)
. B

W .  Otherwise Black takes entire board.
. B
```

```
W B
. B

W .
W .

W B
W .
|
W B  Variation 1: White passes
W .
|
. B
. B
|
W B
. B
|
W B  And White cannot move.
. B  Black wins by 1.
|
. B
W B
|
. B  And White cannot move.
W B  Black wins by 1.
|
W .  (Variation 2)
W W
|
. B
. .
|
. B
W .
|
. B  And White cannot move.
W B  Black wins by 1

W B  (white passes)
. B

W B  (Black's pass ensures the +1 win)
. B
```

But the complexity of the 2x2 game pales in comparison with Nx1 Go, which also has the name Linear Go. In Linear Go, absolute life is very difficult to create against perfect play! Usually either side can sacrifice stones to start lines of play with very complicated multiple kos. And usually each of those lines only ends with a clear winner when one side cannot repeat a board position due to Super Ko rules.

As a function of the number of points on the boards, I strongly suspect that Nx1 Go is more complex than the corresponding square board with the same (or nearly the same) number of points. For example, solving 7x7 Go may be far easier than solving 49x1 Go.

In fact, as far as I know, no one has definitively solved 12x1 Go, much less 49x1 Go.

Thanks,

Myron Souris