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Appendix A: Report on the First International Clobber Tournament

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1. Introduction

Clobber is a new game that was introduced at the 2002 Dagstuhl seminar on Algorithmic and Combinatorial Game Theory [1]. The seminar featured a clobber tournament in which 26 players from a various countries vied for the title of Clobber World Champion. After four rounds of play, the two finalists were Jiri Sgall and Tomáš Tichý, both of the Czech Republic. In the following sections we present, with commentary, the games played in their best-of-three match.

All games were played on a 5×6 board starting with the checkerboard pattern shown in Fig. 1. We use 'x' to denote a black stone and 'o' to denote a white stone; by convention black moves first and is Left for the purpose of computing game values. A player moves by picking up one of their own stones and "clobbering" an adjacent stone (horizontally or vertically) of the opposite colour. The clobbered stone is removed and replaced with the one that was moved. The last player to move wins the game.

2. Game 1

	Jiri	Tomáš
1.	f2-e2	d5-d4
2.	c1-c2	b3-c3 (diagram)

White begins to form a potentially strong group of stones in the center.

3.	a5-b5	d1-d2? (diagram)

```
5 xox xo
4 oxooox
3 x ooxo
2 oxxxx
1 xo oxo
  a b c d e f
```

After 2. ... b3-c3

```
5 xx xo
4 oxooox
3 x ooxo
2 oxxox
1 xo xo
  a b c d e f
```

After 3. ... d1-d2?

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```
5 x o x o x o
4 o x o x o x
3 x o x o x o
2 o x o x o x
1 x o x o x o

  a b c d e f
```

Fig. 1. Initial position.

f3-e3 is a better way to strengthen the center group; d1-d2 isolates the white stone on f1 and gives black the opportunity to move the stone on e3. Alternately, e4-f4 creates a $\downarrow$ in the top right corner by isolating the black stone on e5. Computer analysis shows that either of these moves is winning, whereas d1-d2 is not.

4. e3-f3 d2-c2?? (diagram)
e3-f3 was not a winning move, but d2-c2 creates an $\uparrow$ in the bottom right corner, which is very good for black.

5. b2-a2! a4-b4?? (diagram)

```
5   x x   x o
4 o x o o o x
3 x   o o   x
2 o x o   x
1 x o   x o
  a b c d e f
```

After 4. ... d2-c2??

```
5   x x   x o
4   o o o o x
3 x   o o   x
2 x   o   x
1 x o   x o
  a b c d e f
```

After 5. ... a4-b4??

Black creates another $\uparrow$ in the bottom left corner, and white again assists black by turning it into a $\Uparrow *$. The game is essentially over at this point.

6. e5-e4 f5-f4
7. e4-f4 (diagram)

The game has decomposed into components with values $\Uparrow *$ (bottom left), 0 (centre), 0 (right) and $\uparrow$ (bottom right).

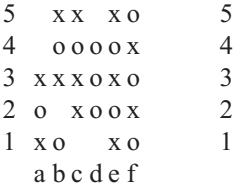
7. ... b1-a1
8. a2-a1 c4-c5
9. b5-b4 f1-e1
10. e2-e1 black wins

```
5   x x
4   o o o   x
3 x   o o   x
2 x   o   x
1 x o   x o
  a b c d e f
```

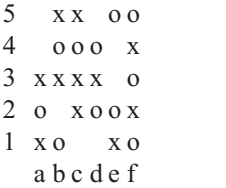
After 7. e4-f4

3. Game 2

	Tomáš	Jiri
1.	c1-c2	a4-b4
2.	b2-b3	d5-d4
3.	a5-b5	d1-d2 (diagram)



After 3. ... d1-d2



After 4. ... e4-e5?

Computer analysis shows that black's only winning move at this point is f4-f3.

4. e3-d3 e4-e5? (diagram)

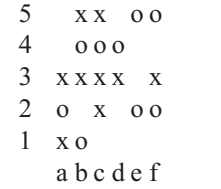
e4-f4 is a stronger move as it creates a ↓ in the top right corner.

5. f4-f3

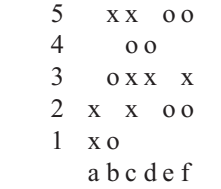
This seems like a good move as it capitalizes on White's mistake by removing two white stones from play. But f2-e2 and f2-f1 are both stronger moves as they create an ↑ ∗ in the top right corner. Alternately, a3-a2 creates an ↑ in the bottom left corner. All three of these moves are winning, whereas f4-f3 is not.

5.	…	f1-f2
6.	e1-e2	d2-e2 (diagram)

This looks like a good move as it creates a ↓, but black can counter with a3-a2, creating an ↑ and leaving a position in the center which is a second player win. Computer analysis shows that d2-d3 is the only winning move for white.



After 6. ... d2-e2



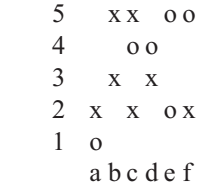
After 7. ... b4-b3

7. a3-a2! b4-b3 (diagram)

8. c3-b3??

A blunder, which quickly loses to c4-c5 (by symmetry). Correct is c5-c4.

8.	…	b1-a1
9.	f3-f2	(diagram)



After 9.f3-f2

White still has an easy win with c4-c5. Unfortunately, white somehow missed this move and thought that the game was lost.

9. … resigns??

4. Game 3

	Jiri	Tomáš
1.	f2-e2	f3-e3
2.	d4-c4	(diagram)

```
5 x o x o x o
4 o x x  o x
3 x o x o o
2 o x o x x
1 x o x o x o
  a b c d e f
```

This is a weak move as it allows white to create an ↑ with e4-e5.

2.	...	b5-b4
3.	b2-c2	b3-c3
4.	a5-a4	b4-c4 (diagram)

After 2. d4-c4

```
5     x o x o
4 x   o   o x
3 x   o o o
2 o   x   x
1 x   o x x o
  a b c d e f
```

White is threatening d5-e5! Computer analysis shows that black's only winning move is e5-e4.

5.	d2-d1	b1-c1! (diagram)

After 5. ... b1-c1

```
5       x o x o
4 x     o   o x
3 x     o o o
2 o     x   x
1       o x o
  a b c d e f
```

White has created a ↓ ∗ in the bottom left corner.

6.	c5-d5	e4-e5
7.	a1-a2	c1-d1 (diagram)
8.	c2-c3	c4-c3
9.	resigns	

After 7. ... c1-d1

```
5       x o o
4 x     o     x
3 x     o o o
2 x     x   x
1       o x o
  a b c d e f
```

The position has value ⇓ and is easily played by white, so black is wise to resign.

5. Discussion

Tomáš Tichý is the current Clobber World Champion after very nearly losing the match in Game 2 to Jiri, who mistakenly resigned from a winning position. It is clear from the games that a basic knowledge of game-theoretic values is of great assistance in the middle- and end-game. At the start of the game the position has not yet begun to decompose, and players must rely on other principles to guide their choice of moves. One fairly successful strategy that was independently discovered by many players in the tournament is to try to group stones together in mutually protective arrangements. Beyond this, however, little is known regarding what constitutes "good" play towards the beginning of a game.

The 5×6 board was chosen to be large enough to be interesting yet small enough to be accessible to complete beginners and also to allow for shorter games. Since the tournament, however, computer analysis has determined that this game is a second

Table 1
Perfect-play outcomes for rectangular boards up to 5×6

Board	Outcome
$6 \times n$ ($n = 1, 2, 3, 4, 5$)	2nd player win
5×5 (both configurations)	2nd player win
$5 \times n$ ($n = 2, 3$ (both configurations), 4)	1st player win
xoxox (x moves first)	o wins
oxoxo (x moves first)	x wins
4×4	1st player win
4×3	2nd player win
4×2	1st player win
4×1	1st player win
3×3 (both configurations)	1st player win
3×2	2nd player win
3×1 (both configurations)	1st player win
2×2	1st player win
2×1	1st player win

player win. This makes the 5×6 board somewhat less appealing; 8×8 or larger would be more appropriate for future tournaments. Table 1 lists the perfect-play outcomes for all rectangular board sizes up to 5×6. In each case the initial configuration is a checkerboard pattern; note that for *odd*×*odd* boards there are two initial configurations (which, as it turns out, only affects the outcome in the 5×1 case).

References

[1] J.P. Grossman, Richard Nowakowski, Michael Albert, David Wolfe, An Introduction to Clobber, in preparation.