Issue 22 Autumn 2021

Abstract Games

... for the competitive thinker

Unequal Board Spaces Game Design Competition

Mirador by Andrew Perkis

Retrospective of Mark Steere games

Penchant: A lost Victorian Bezique variant

Cubeo: An abstract game with dice

Christian Freeling on clarity

Three solitaire abstract games

Front Cover

Entrapment (1999) is a game by Richard Gowell (1968 - 2020). I had some discussions with Rich about his game from November 2019 to January 2020. We planned to use Entrapment on the cover of one of the issues, and so here it is. The image shows the original Gowell Classic Games version. Sadly, Rich passed away later in 2020. This issue is dedicated to the memory of Rich Gowell, designer of the great game Entrapment.

Entrapment belongs to a small genre of games in which pawns occupy the squares and maze-like formations develop as barriers are placed on the boundaries between squares. The earliest of these games that I know of is Cul de Sac (1975), by Philip Slater, which was republished in several editions as Blockade (1979). Quoridor (1997), attributed to Mirko Marchesi, has many similarities to Cul de Sac, and I would be very surprised if one game did not inspire the other. Another game which belongs to this genre is Fendo (2014), by Dieter Stein. The objective of Fendo is to build territory; the objective of Cul de Sac and Quoridor is to move pawns across the board through the growing maze to specific locations. Entrapment is more aggressive, with the objective to trap and thereby eliminate opposing pawns, called "Roamers."

Entrapment is played on a 7x7 board with three Roamers and a collection of barriers for each side. The game starts with an empty board, and players take turns to place their Roamers on vacant spaces. Each turn, players must complete two actions. (In the first move, the first player takes just one action to account for first-player advantage.) The first action is move a Roamer; the second action is either place a barrier or take a second move with a Roamer. Roamers move one or two spaces in a straight line orthogonally. Roamers can jump friendly Roamers and barriers, although a barrier once jumped is turned on end and becomes impassable for both players. When a Roamer is completely surrounded so that it cannot move, it is captured and removed from the board. The objective is to capture all three of the opponent's Roamers.

In my conversation with Rich, he strongly recommended to play with a 6x7 board, with one row of squares marked out of play with a pencil or some other such device. According to Rich, "It's a tighter more aggressive form of the game that I particularly enjoy."

Entrapment is playable on Boardspace.net, which contains a large number of archived games, some played by Rich himself, and many with the 6x7 board. To investigate Entrapment strategy, one route would be to play through the old games by Rich himself. On my querying him about strategy and tactics, he replied,

"At some point I'd love to see enough serious interest that an article might be published on the topic. I developed the game about 20 years ago, when I had the idea for a labyrinth-style game and built a prototype to test it. It was interesting but a bit too complex and convoluted. As I sat there staring at the prototype, the key idea of entrapment, jumping a friendly wall one time, struck me. In relatively short order my brother and I were playing a crude version of the game. Rules were refined over the coming few months till it was in its current form. A partner and I self-published the [Gowell Classic Games version] for a few years a decade ago. More a labour of love than anything else. Hoping that this next edition comes to fruition so the game can reach a larger audience."

We would love to have some further analysis and discussion of Entrapment in *Abstract Game*s magazine. If you are a keen Entrapment player, and you are interested in writing about the game, please let me know. ~ Ed.

Contents

1. EDITORIAL

2. GAME REVIEW
Raft & Scupper and Bridget

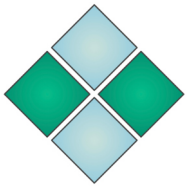
3. BOOK REVIEWS
Arimaa... Still a game to take seriously

4. MARTIAN GAMES
Chessboard Jetan

5. ABSTRACT GAME THEORY
Clarity: Foggy notions
by Christian Freeling

10. GAME DESIGNER
Mark Steere Games: A retrospective
by Kerry Handscomb and Mark Steere

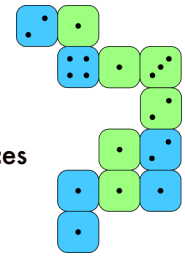
19. GAME DESIGN COMPETITION
Unequal Board Spaces
by Kerry Handscomb



23. POKER VARIANTS
Quintet

24. GAME DESIGN COMPETITION
Jed: A Revisioning of Hex, with Shared Pieces, Different Objectives, and Unequal Board Spaces
by J. Mark Thompson

26. BOOK EXCERPTS
Abstract Game Heuristics
by David Ploog



30. GAMES WITH DICE
Marek Kolcun's
...abstract game with dice as pieces
by James Nichols

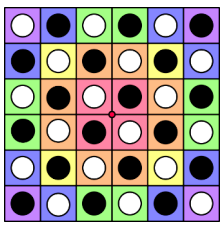
35. CONNECTION GAMES
A game by Andrew Perkis: Mirador
by Paul van Wamelen

39. CARD GAMES
Penchant: Reviving a game from the past that feels modern
by Jonathan Kandell

51. SOLITAIRE ABSTRACT GAMES
Three Solitaire Abstract Games
By Karen Deal Robinson

49. DIRECTORY OF GAMES BY ISSUE

OUTSIDE BACK COVER
Zola



Initially the plan was to announce the winner of the Unequal Board Spaces Game Design Competition in the next issue. We planned to write about several of the entries in the current issue, and the rest in the next issue with the results of the judging. However, *AG22* is a bit delayed, we have all the votes in, and *AG23* has a long way to go. Therefore, I am going to announce the winner here, which happens to be a game that we had planned to describe in this issue anyway. In *AG23*, we will continue with the plan of presenting the remainder of the games, but also give some more substantive discussion of the judging and the winner.

The Winner of the Unequal Board Spaces Game Design Competition is Dag en Nacht by Chris Huntoon.

Dag en Nacht collected more points than any of the other games in the voting, and several judges specially commented about Dag en Nacht and its quality. Dag en Nacht is a clear winner. Congratulations to Chris Huntoon!

The rules of Dag en Nacht are here in this issue. Dag en Nacht [Day and Night] is an alignment game, like Gomoku, Renju, Connect 6, and the rest. The author was inspired by the woodcut engraving Dag en Nacht, by Maurits Cornelius Escher, from 1938. The aesthetics of Dag en Nacht, with black and white stones on black and white spaces, is genuinely reminiscent of Escher's brilliant design. Dag en Nacht is an alignment game that perfectly utilizes the checkered pattern on a squared board.

The Unequal Game Design Competition was a success. Thank you to all of the designers, the judges, and advisors. Special thanks are due to Stephen Tavener, who implemented all the entries to the competition on Ai Ai. The ease of being able to test these games in Ai Ai was key to ensure that the judges were able to make good decisions. A big thank you also to Dave Dyer, who has already implemented Dag en Nacht on Boardspace.net.

Someone mentioned to me that the topic of this competition, games with boards with variable spaces, would produce games that were naturally opaque, meaning that it is difficult to see what is going on in them and make meaningful moves. I do not think this is necessarily the case. The winner, Dag en Nacht is surely no more "opaque" than other alignment games. Christian Freeling's article about clarity in the current issue, is relevant in this regard. According to Christian, the difficult concept of "clarity" in board games comes down to familiarity: "Clarity is familiarity," he concludes.

I agree with Christian. Perhaps Zola, for example, seems initially opaque; but if you play a few games, heuristics will develop, and Zola will make more sense—this is becoming familiar with Zola. (See also David Ploog's article about heuristics in this issue.) To an extent, clarity versus opacity might be influenced by a game's complexity, and variable board spaces may mean an additional layer of complexity. However, opacity does not necessarily rise with increasing complexity.

Arimaa is a relatively complex game compared with the minimalist abstracts to which we often give coverage. We write about Arimaa in the current issue. Arimaa is a game with variable board spaces because of the traps. Arimaa is a game that I find difficult to get to grips with, and if it wasn't for the Arimaa literature, two excellent print books and an extensive Wiki Book, I might well give up on the game. Nevertheless, Arimaa theory is highly developed, and the literature provides important and fascinating insights into the game. In other words, the Arimaa literature cuts through Arimaa's fogginess to provide us with some clarity about the strategy and tactics of Arimaa. The literature makes it much easier to see what is going on in a game of Arimaa. I suppose this is clarity through familiarity at second hand, in which the authors of the books pass on their hard-won insights to the rest of us. Arimaa's relative complexity only affects its clarity when beginning the game and before you start to learn the strategy and tactics.

Perhaps as a whole, the entries to the competition are relatively more opaque than games without variable board spaces. Nevertheless, I think it would be misleading to state that all games of this type are opaque. There are other factors involved, such as Christian's notion of familiarity and the various techniques that we can use to become familiar with a game, whether through playing the game a lot or by taking a short cut and reading books about the game.

We will wrap up the competition in the next issue, with descriptions of the games that didn't fit into this issue and additional commentary about the judging. At least two other games deserve special mention in this respect. And then, of course, we should look towards the next game design competition. We have some ideas but would really appreciate suggestions.

Kerry

Maze setup (see page 51)

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Raft & Scupper and Bridget

Reviews by Kerry Handscomb

Raft & Scupper and Bridget are two games published by ET Games. In addition to these two abstracts, the company puts out a variety of original dexterity games. Their games are made in India by Asha Handicrafts, a fair-trade partner for ET Games. The games are all manufactured from the attractive sheesham wood, which is grown locally in India and harvested sustainably.

For neither of these games do I have a really in depth review. I did play quite a lot of Raft & Scupper with Ai Ai, and this has been teaching me the basics. Bridget is aately stands out as worth investigating. We would welcome submissions from enthusiastic players: game scores, puzzles, thoughts about strategy, and so on.

Raft & Scupper

A game by David Vander Laan

Raft & Scupper (2019) is a game played without a board, but with 36 square tiles, 18 light and 18 dark, and two "pirates" of each colour—the game has a very loose pirate theme. Half the tiles of each colour are marked with square-rigged sails, and half are marked with round-rigged sails. The two light pirates are "round-bellied Yellowbeards," corresponding to the round-rigged sails; the two dark pirates are "square-jawed Blackbeards," corresponding to the square-rigged sails.

To start the game the tiles are arranged in an oblique square, with a mechanism to guarantee that the starting position is precisely balanced between the two sides. A starting setup is shown in the title image above. A smaller setup is possible using only 16 tiles. One player places the four pirates on four different tiles. Pirates can only occupy tiles with their colour or tiles with sails of their shape, which gives them access to three-quarters of the tiles. Pirates are not able to occupy tiles with the opposite colour and the opposite shape. After the four pirates are placed, the other player decides which side to play.

On a turn, a player can move a pirate to an adjacent tile ("jump ship"), destroy (or "scupper") a tile, or move (or "sail") a tile occupied by one of the player's pirates to any other position around the connected group of all tiles. The set of all tiles must remain connected, despite any scuppering or sailing that goes on. In addition, a player may pass a turn at any time.

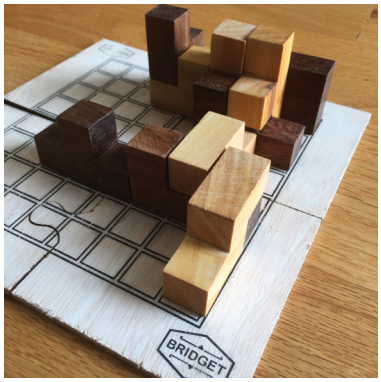
The objective of the game is to manoeuvre the tiles so that either all tiles of your colour are in an orthogonally-connected group or all tiles with sails of your shape are in an orthogonally-connected group. This is called "rafting up." Otherwise, you win if you can accumulate four more scuppered tiles than your opponent, a win by "scuppering." Lastly, if both players pass their turns consecutively the game ends, and the last player to scupper a tile is the winner, a win by "vengeance."

Raft & Scupper has some similarities with Lines of Action (*AG1 and other issues*) in that the objective is to unite your pieces into a connected group. Lines of Action, too, has a shrinking collection of pieces as they are captured one by one. The shrinking board mechanism is reminiscent also of Zèrtz (*AG6 and other issues*), which despite its quite different objective, also features a declining playing area. In all of these games, this mechanism leads to tight and exciting endgames. Raft & Scupper's objective of scuppering four more tiles than your opponent gives further scope for a wide variety of threats. Despite similarities with Zèrtz and Lines of Action, Raft & Scupper is very much its own game.

I am too inexperienced with the game to suggest workable strategies with any confidence. However, it seems clear that it is good always to have one of your two pirates in a position to scupper a tile. I have been caught with my opponent scuppering tiles, where I have to scramble to reposition pirates to catch up. It is surprisingly easy to lose by scuppering, at least for a beginner.

You have to be careful which tiles of opposing colour and shape you are scuppering, because with too many of these off the board you make it easier for your opponent to raft up the remaining pieces. On the other hand, scuppering tiles of your own colour and shape may make rafting up easier for you. But then, if you scupper tiles to which you are not able to move, in other words those with opposing colour and shape, you may give yourself some extra manoeuvrability. Clearly, there are several factors to balance when deciding on a move. Maybe achieving the right balance is the essence of Raft & Scupper strategy.

Raft & Scupper is published in a polished wood edition, with a solid box that holds the tiles. Raft & Scupper is playable on Ai Ai (http://mrraow.com/), but the physical game is worth having. I recommend Raft & Scupper.



Bridget

A game by Stefan Kögl

Bridget (2014) is a connection game, developed from the designer's earlier game, Caminos (2010).

Bridget uses an 8x8 board, and a set of 14 three-dimensional tetrominoes for each player. The tetrominoes consist of four cubes each rather than four squares, and they are of four types: square, T, L, and Z (or "skew"). The long, straight tetromino shape is not used. The objective is to connect either pair of opposite sides of the playing board with a line of your own pieces. Pieces can be placed so that one piece stacks on or overlaps another piece, but all pieces must actually touch the playing board, and you cannot create empty spaces underneath your pieces when you place them. The winning line connects either of the two pairs of opposite sides. It is not enough that a connection exists when viewed from above; the connecting line may necessarily include vertically-oriented squares. And that is it, the game is that simple.

The three-dimensional aspect of Bridget is fascinating, and it reminds me of Akron (*AG14*). With Bridget, however, the requirement that a piece must always touch the board sets a limit to the game's upward growth.The L-shaped pieces are particularly valuable because they are the only pieces that can rest over the top of an an opposing line that is two stories high, potentially breaking the opponent's connection. The ability to

connect either pair of opposite sides is a second unusual feature among connection games, which Bridget shares with Gonnect (*AG6*), Tak (*AG17*), and Mirador.

Like Raft & Scupper, Bridget is constructed of the attractive sheesham wood. The board disassembles into four pieces, and the whole game fits into a carry bag. In my opinion, Bridget stands with Akron, another connection game in which the the pieces climb over each to construct the winning line. The additional dimension is a very appealing feature of games, and I certainly recommend Bridget.

Arimaa

...still a game to take seriously

by Kerry Handscomb

Arimaa was developed by Omar Syed in 2002. We covered it in *AG16*, in 2003, and even in those early days I think there was a recognition of the importance of Arimaa. At the time, Arimaa was touted as a game that would be difficult for AI's to win, and so it was proven to be. Only in 2015 did David Wu's program Sharp defeat the strongest human players. With hindsight, now, from the vistas opened up by Alpha Zero, it is obvious that any of our games can potentially be played by AI's of superhuman strength. Arimaa is no exception.

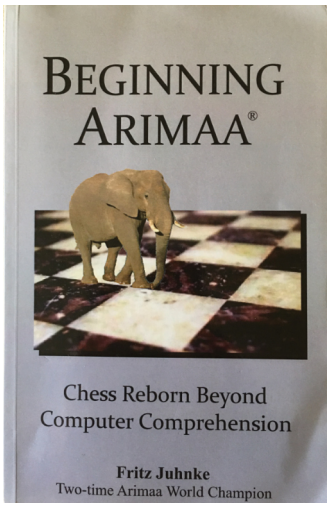
To be fair, the game's designer never claimed that the machines would not eventually prevail. Nevertheless, much of the early history of Arimaa is coloured by the heroic struggle of human versus machine. The battle is over now. I think we must focus solely on the merits of Arimaa as a game and why we should still consider playing Arimaa.

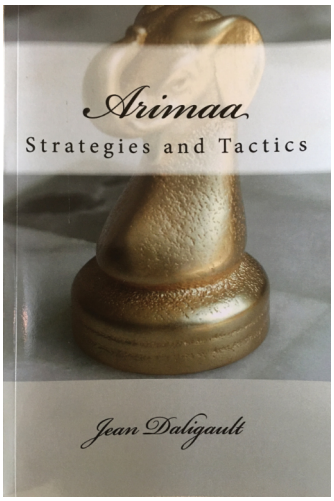
Of course, Arimaa has a deep strategy and intricate tactics, and we should welcome these ways of making sense of any game. To understand Arimaa is to have some clarity about the game, to have some workable theories about how to play well—see the article on page 5 by Christian Freeling on clarity. These theories may be referred to as heuristics—see also the article on page 26 by David Ploog. Some games encourage development of these theories, but others are more opaque.

The literature of Arimaa provides us with a shortcut for understanding the game. As we understand the game better, it becomes more enjoyable. The existence of this literature, in addition to Arimaa's qualities purely as a game, is a significant factor in the decision about whether or not to spend any time with Arimaa and take it seriously.

There are few modern games that have this quality, where very intelligent people have spent a long time studying a game, working out how to play it well, and then writing down this new knowledge for others to follow. Scattered here and there, Hex has a significant literature, and so does Twixt, to a lesser extent. Books have been written about Pente and Reversi. In recent years, I think we can include Hive and Tak in the highly exclusive club of modern games that possess a literature. No doubt there are several more. And of course, there is Arimaa, which now has a relatively long history of thorough investigation. The existence of a literature for any one of these games is a reason for playing it, aside from the merits of the game in itself.

Arimaa is playable with a regular Chess set. However, the Z-man Games version, published in 2009, and shown in the header image, is perfect. It is out of print now, but used copies are easily available. If you plan to play a lot of Arimaa, I would recommend getting hold of one of these custom sets.





And so, Arimaa has its own literature. The Arimaa Wiki Book is free and extensive. If you have any interest in pursuing Arimaa, I would download the Wiki Book to browse through. My first approach to Arimaa literature, however, was Jean Daligault's *Arimaa Strategies and Tactics*, self-published in 2012. This book is still available. It is deep and detailed, although difficult for beginners. The author himself recommends first reading the Wiki Book or the earlier print book, Fritz Juhnke's *Beginning Arimaa: Chess Reborn Beyond Computer Comprehension*, published in 2009 by Flying Camel Publications. *Beginning Arimaa* is out of print, and more difficult to get and more expensive. Nevertheless, I snagged a copy, and I am glad I did, because this is where I think you should start if you want to get to grips with Arimaa.

Juhnke was clearly still strongly influenced by the human versus machine rivalry, and in this sense the book has not aged well. You may either set aside these aspects of the book and not read them, or read them anyway, because Juhnke's writing is so good and his infectious enthusiasm for Arimaa is apparent on every page. The weight of the book nevertheless lies in its discussion of Arimaa strategy and tactics. Juhnke is one of the very best players that Arimaa has produced, and he has much of interest to say about the strategy and tactics of Arimaa. His writing style is simple and clear.

Juhnke begins with the very basics, simple winning threats, how to get your Rabbit to the goal line, and how to defend against them. It was reminiscent of the advice to Shogi beginners, to study *tsume* mating problems. Then he covers attacking techniques with traps and how to defend against them. Starting with these elements, the author moves on to explain the necessity for strategic as well as tactical thinking, and subsequently develops various strategic ideas. The content of this book encourages more clarity about Arimaa, which thereby makes the game more enjoyable.

Juhnke uses many examples taken from actual games going back to the very beginnings of serious competitive play of Arimaa. He organizes the elements of Arimaa strategy and tactics in concise chapters, with several examples each from actual play. Perhaps this book can be said to define the elements of Arimaa theory, under headings like "Elephant Smother," "Camel Hostage," and "Efficiency, Balance, and Tension," among many more. No doubt there was much discussion about these ideas among strong players, but Juhnke was the one to pull it all together in this intelligible order.

Juhnke's belief in the depth and significance of Arimaa is present throughout the book. He writes,

"But every time I felt Arimaa had revealed its secrets to me, other players found ways to complicate and surpass my conception of the game, forcing me to look for deeper patterns than before. The Hegelian process of understanding Arimaa strategy is nowhere near to running out of steam.... A few years from now, the strategy I will be trying to execute will be something that today has no name and has not yet been properly described. Arimaa will be popular years from now because, if you devote yourself to it, it will reward your discipline and make you feel that it has been worthy of study. At the end of the road, after Arimaa has grabbed your attention, provided you material to learn, and engaged you with endless synthesis of what you have learned, you will not merely like the game, you will respect it." (pp. 78-79)

That sounds good to me, but he is writing 12 years ago, and interest in Arimaa did not grow as its supporters hoped.

While reading Beginning Arimaa, I enjoyed a fairly good run on the bot ladder on the Arimaa website, and I hope the book will take me still further. In addition to the written materials I have already referred to, the two print books and the Wiki Book, the website itself is a good resource. The website contains a great many high-quality championship games to work through. In addition, it has a bot ladder, and as you get better at the game, you can practice your skills by challenging stronger and stronger bots. And you can find human opponents through the website, too.

Arimaa has achieved at least modern classic status, and after all this time it is gratifying to see the World Championship still running through the website every year. A small community still plays on the website, although you will quickly see that a large majority of the games are against the bots. Of course, the bot ladders are an excellent resource, and a reason in themselves for giving Arimaa a try.

The website interface for games still works perfectly, as do the bot ladders. If the website ever disappeared, Arimaa could be played on Boardspace.net, and maybe the community would move there. This would be a pity, however, and I hope for further development of the flagship website as well as further progress in Arimaa theory.

The existing Arimaa literature can take you as far as anyone ever gets in understanding any of our beloved abstract games—with the exception perhaps of the traditional games like Chess or Go, which have millions of followers, extensive amateur and professional organizations, and mounds of literature. If you wish to play a game seriously, but do not feel like one of the traditional games, you can give the modern classic Arimaa a try. Play a few games first to get the hang of the rules, read the books by Juhnke and Daligault, and see how far you get on the bot ladder. If you really enjoy the game, there are still options for serious human versus human competition.

In the meantime, we await the arrival of Alpha Zero for Arimaa, which may uncover whole continents of strategy we never knew existed. The irony is, the Alpha Zero scenario may bring Fritz Juhnke's dreams to fruition, but in an unexpected way. I have confidence in Arimaa. In the meantime, there is still Juhnke's book, Daligault's book, the Wiki Book, and whatever else can be found on the website. Arimaa is still a game to be taken seriously. ■

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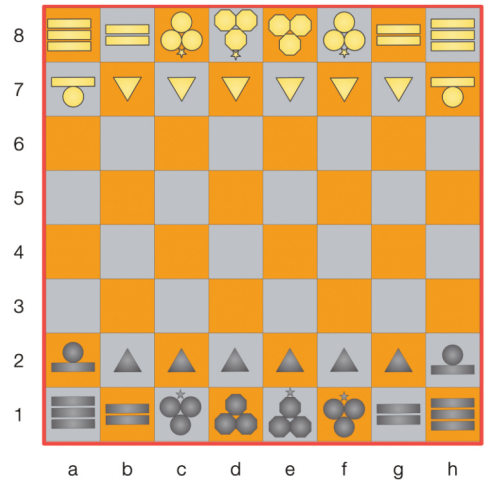
Chessboard Jetan

Chessboard Jetan is a variant of the standard 10x10 game (*AG6, AG19, and others*), designed by Fredrik Ekman to be playable with a standard Chess set. Just as Arimaa (opposite) needs a modified board to mark the traps, Chessboard Jetan needs a pair of Pawns on each side to be separately identified. We might say, both games are *almost* playable with a standard Chess set.

For Chessboard Jetan, make the following equivalencies: Rook=Dwar, Knight=Thoat, Bishop=Flier, King=Chief, Queen=Princess, and Pawn=Panthan. A pair of Pawns on each side needs to be marked in some way, and these are the Warriors. The opening position is as follows, with the same iconography as the article in *AG19*:



Chessboard Jetan does not use the Padwar, and placement of Dwars and Warriors is reversed from regular Jetan. Otherwise, Chessboard Jetan follows the rules of regular Jetan, as given in *AG19*, with a single exception: Princess and Chief make only two step moves on a turn, not three. Just as with the regular game, only Fliers and Princess can jump.

In addition, we have been testing the rule that capture of the Chief with a non-Chief is a *minor win*, worth 2 points—in regular Jetan it is a draw, which is widely recognized as a defect of regular Jetan. Capture of Chief by Chief or capture of the Princess is a *major win*, worth 3 points. Draws, of course, are still worth 1 point for each player. Even when playing a single game, a major win bestows more Barsoomian honour and glory!

We still use the Princess Escape move of regular Jetan, but I think the game might be even sharper without that rule, because it would make it easier to achieve a major win, or at least threaten a major win.

The Flier still makes three step moves, and the Flier still jumps, of course. Your two Fliers are the most useful and dangerous pieces in Chessboard Jetan, more so than in regular Jetan. Chessboard Jetan is interesting because the two most powerful pieces in your army each only cover half the board. They work as a pair to cover the whole board. A Flier can sometimes fork the Princess and Chief.

The game needs further investigation. However, initial indications are that it preserves the best of Jetan while resolving some of the problems inherent in that game. Even with the Princess Escape rule, Chessboard Jetan is faster and sharper than the regular game. The armies clash early, and Flier threats can quickly materialize.

A chess game where the pieces each move in a series of step moves is an audacious concept, which makes of Jetan something more than just a chess variant. Chessboard Jetan is game that exemplifies well the special features of this kind of chess. ~KH

Clarity: Foggy Notions

by Christian Freeling

I got a foggy notion, do it again
Over by the corner, do it again
I got my calamine lotion, do it again
I got a foggy notion, do it again

(Chorus from "Foggy Notion" by The Velvet Underground)

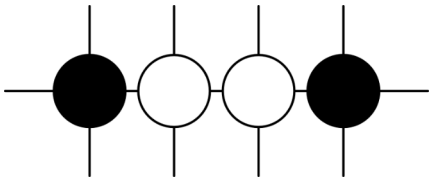
Robert Abbott and clarity

In 1975 Robert Abbott, the inventor of the game Epaminondas, published an article titled "Under the Strategy Tree" in the May issue of the British publication *Games & Puzzles* (Issue 36). In it he wanted to explain his concept of clarity as he puts it in the article, and he summarized it like this:

"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'."

That sounds close enough for anyone to whom abstract games of the kind featured at Mindsports are at most a side issue in life. Why shouldn't there be clarity and why shouldn't it be related to a game's depth? The only problems are that "the ease with which a player can see what is going on in a game" is too subjective to be be used as a definition and that describing "depth" in such terms may become elusive in the very attempt to pin it down.

There was no internet in 1975, no place where you could play games with other people all over the world, and there weren't many games of the Mindsports type. In the western hemisphere there were traditional games like Chess, International Draughts and Checkers, while hardly anyone had heard of "eastern" games like Go, Shogi, and XiangQi. But in the toy shops one could find Sid Sackson's Focus, Alex Randolph's Twixt and the 19th century game Reversi that had been relaunched as "Othello" in 1971.



Pente (and Ninuki Renju) capture

Gary Gabrel's five-in-a-row game Pente was on the brink of publication. He had modified the traditional five-in-a-row idea by adding a modest capture mechanic to it, leading to dramatically altered tactics. Game inventing was in the air!

There was also the game of Hex which was as simple and deep then as it is now, but it lacked a large following. In a way that is also "as it is now," because although there is a fairly large Hex community at the Little Golem game site, the global spread of Hex still does not show anything like the density of Chess or Go. But if we take the number of levels of expertise at which humans are capable of playing a game as a measure of its depth, then there are currently more than enough active players, who are playing at a wide range of levels, to justify calling the game of Hex deep. The problem with this criterion is that it can only be based on large numbers of players who have played many games over a long period of time. It is useless in estimating the depth of a new game.

That is where we were in 1975 and it is nice to see that the newly invented games that were mentioned above are still known and being played in the small circles of lovers of abstract strategy. But nowadays there are many hundreds of other games of our particular kind and there are also AI programs that allow taking them apart in novel ways to learn more about their clarity, depth, decisiveness, balance, and possibly even drama. So knowing what we mean by those things would seem appropriate.

Is clarity a property of a game?

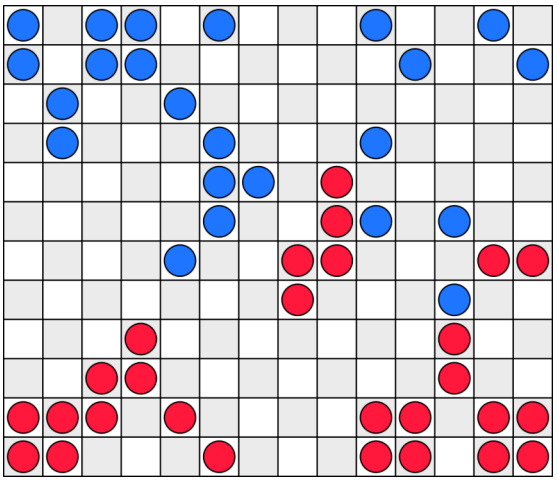
Here is another quote from Robert Abbott's article:

"The apparent 'depth' of a game does not depend on how far you can travel down the strategy tree of the game. It instead depends on how far you can see down the strategy tree. And how far you can see depends on the clarity of the game."

There is a tautological smell here: the game is deep because it has clarity and the game has clarity because one can see deep into its game tree. It also does not explain what traveling down a game tree means, as opposed to looking down a game tree. But apart from that, the argument does not take the observer's level of play into account, or it would not say that playing a game will soon reveal its degree of clarity, which obviously addresses new games rather than known ones. This way of suggesting that clarity is a property of a game rather than the result of progressing interaction between a game and a player, may well have contributed to the fact that eventually discussions at BoardGameGeek about "clarity" seldom had clarity to spare.

What actually happened, at least in my view, is that Robert fell in love with his own description of the game:

"Epaminondas is clear because the magnitude and direction of the forces are shown by the size and direction of the phalanxes. Thus the patterns that develop during the game graphically display the confrontation of power."



The "confrontation of power" in Epaminondas

Epaminondas had a published predecessor called Crossings, so its evolution had taken a long time and during that time the very idea of "clarity of a board game" may have emerged in his reflections, becoming ever clearer—so much so that it eventually craved for a general description. Next, he completely tailored the description to fit Epaminondas, which in consequence emerged as a game of great clarity.

To forego a possible misunderstanding, this is not in any way meant as a criticism of Epaminondas, which is an excellent game in its own right. And given its goal, positions look clear enough for that matter. But in terms of their goal, positions look clear enough in many other games that are known to be deep and known to have great clarity to at least some players, like grandmasters. So having Epaminondas serve as a touchstone for the presumed clarity of board games seems like little more than wishful thinking to me.

Clarity and Depth, how do they relate?

According to Robert Abbott, clarity and depth go hand in hand:

"A game can be simple yet lack clarity, and conversely a game can be complicated but still clear. Playing a game soon reveals its degree of clarity. The greater the clarity of a game, the farther you can see into it, and therefore the greater its depth for you."

Then, in July 2000, J. Mark Thompson published a small essay titled "Defining the Abstract," in which he gave his view on clarity:

"Clarity means that an ordinary human being, without devoting his career to it, can form a judgment about what is the best move in a given situation."

That's rather non-committal and it presumes a fairly knowlegeable player but no specific game. He also presents his view on the relation between clarity and depth on the one hand, and decisiveness and drama on the other:

"I list these four qualities because they seem to me to be in tension with one another by pairs: depth vs. clarity, drama vs. decisiveness. For example, if a usable algorithm is known which will always reveal the best move in any situation of a game, then the game's clarity is perfect, but it has lost all its depth."

So games that are too deep will lack clarity and games that are too clear will lack depth. That sounds good, but what about if a game's clarity is less than perfect, for the sake of argument let's say all the way to outright murky, does that mean that it has gained depth? That would make the game Ultima, that Robert Abbott in his article describes as seriously lacking clarity, a very deep game. If the only criterion were the size of its game tree, then this would be true. But as Robert rightly states, it's not the size that matters, but how deep a player might look into it. And Ultima doesn't make that easy, to put it mildly.

Tic-Tac-Toe on the other hand is one of the few games one can learn and master in the same minute. Everything about it is clear and it has no depth. So when Abbott argues that greater clarity leads to greater depth, then he obviously means something else by either or both, although it is unclear to me what exactly. I tend to be with Thompson, who gives a definition of depth that can hardly be argued against:

"Depth means that human beings are capable of playing at many different levels of expertise."

There are cases where this criterion is clearly met, like Chess, Go, Shogi, XiangQi, Draughts, and Checkers for sure, but also modern games like Hex and Othello and variants of which depth is predictable, like Grand Chess. These games have proven to be deep. According to Abbott they therefore should have clarity, while Thompson seems to argue that games lose clarity with increasing depth.

Can they both be right?

Abbott obviously talks about new games and he is right if he means that some new games are easier to access than others. If someone knows neither Chess nor Hex, then Hex would be easier to understand and thus have the greater clarity. But to a Chess grandmaster who is new to Hex, a Chess position would be much clearer. So what a beginner thinks may be important in terms of accessibility is largely irrelevant as a measure of clarity or depth.

Thompson on the other hand seems to argue that if a game is deep, then a player will find that the farther he looks into a balanced position, the more clarity would wane, and that sounds blatantly obvious because it holds for any non-trivial game, whether it allows "deep lookahead" or not. Even if a game or a game position seems murky, then whatever clarity it has, still wanes if one tries to look deeper, farther down the tree.

The assumption in all this is that a seasoned player who considers which move to make in a given position, works his way from position to position down the game tree. This may be mostly true, but there may also be considerations and intermediate sub-goals that do not depend on a precise chronology, that yet add to the clarity of a player's vision. The Dutch Chess master and psychologist Adriaan de Groot found, among other interesting things, that strong Chess players were able to perfectly reproduce Chess positions after looking at them for only a few seconds, while it was impossible for them to do the same when presented with a Chess board with randomly placed Chess pieces. That says a lot about "clarity."

The problem with new games

Regarding the clarity of newly invented games Thompson remarks:

"The difficulty with a newly-invented game, is to discern whether a game is 'invincibly opaque,' or whether with sufficient experience its rules of strategy would begin to clarify."

Again this sounds very logical, but at the same time it is preceded by this statement:

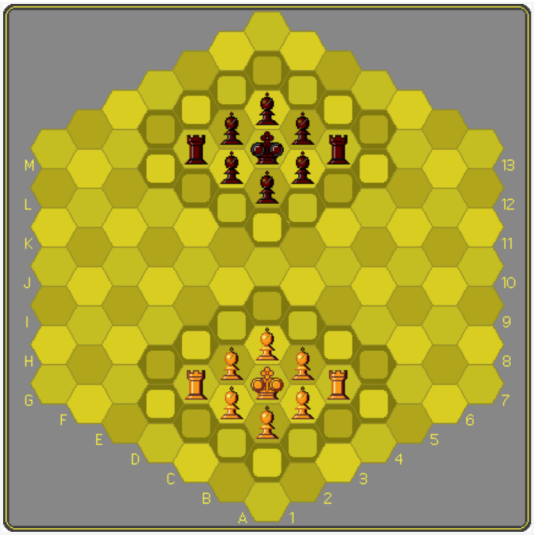
"Robert Abbott, the inventor of the chess variant Ultima, has lost interest in his creation because he feels it is 'opaque.' Though Ultima has many defenders, anyone who tries to invent a new and original game will find clarity an important issue."

What's noteworthy is that it introduces the idea of an "invincibly opaque" game while at the same time acknowledging that the most opaque example that both care to mention still has "many defenders." So how opaque is opaque? Why does "invincibly opaque" become a criterion for a "difficulty" with new games, if it's so difficult to create it in the first place? Ultima is almost half a century old now and if it is still being played or even mentioned, then there must be something interesting hidden in its opaqueness.

At the same time I recall my first attempt at inventing a game of our kind. It was called Chad, a name I later used for a better game. But the first Chad was an attempt to merge Chess and Go as well as an unintended attempt at "invincible opaqueness." I reluctantly trashed it and went on to invent Havannah, which by contrast had a Hex-like clarity.

A game like Hex has very clear rules and a Hex position may look very translucent, but learning to play Hex one inevitably comes across positions that are far from clear. Regardless of the playing level of the observer, at some point things become really, really murky. Given a balanced position, increasing depth of a look-ahead does not lead to clarity, even though the reverse may be true.

I also made King's Colour in those early days, which is an intentionally opaque game. In 2021 it entered *Abstract Games* magazine's "Unequal Board Spaces Game Design Competition" of rather opaque games. I fully understand if it were labelled a "low clarity" game because that was the very point. It was made solely for the fun of it. So I'm not saying that games don't have an inherent quality that one might call "clarity." What I'm saying is that it is a matter of accessibility rather than of depth.



King's Colour

Some games allow a deeper look-ahead than others. In Draughts there are long forced sequences and endgame positions that top players can read out to an amazing depth. Emergo has the same features but in three dimensions, and now trying to look deeper becomes far more challenging. But in the class of games that is considered here, both players inherently face the same challenges, so the depth of the look ahead that a game allows is not really relevant for its ability to pit two players against each other.

Clarity—state or measure, static or dynamic

When consulting assorted dictionaries, the general definition of "clarity" may be summarized as:

"The quality, state or measure of being clear."

In terms of our games we may assume that a high "clarity of rules" is a precondition for accessibility. Rules should be 100% clear, that's an invariable state. But there's also "clarity of vision" and it is not at all invariant. It goes through a number of states if you like, deepening in the process of play and study. And in balanced positions it is never 100%. A designed Chess problem, or a problem in any of the great games, is hardly ever balanced. The only way that comes to mind is a problem that would require you to find an unlikely draw, but usually you're supposed to find a win for one side. That's inherently unbalanced and thus opens up the possibility of 100% clarity by solving the problem. This is the kind of clarity we're talking about here, growing from the interaction of a great game that allows miracles, great players who can perform them, and a large audience who can understand them. The latter two are the greatest challenges.

Speciousness, a nice feature but how to get it?

Nick Bentley is a famous designer of Mindsports type games, so far as famous goes in our circles, and we feature his game Catchup. He manages a games website and writes interesting articles about his inventions and about various aspects of the game industry. In that context he decided to challenge Thompson's article of 2000 on one particular point and he published the result as "Redefining the Abstract." The main point of his essay is:

"Clarity should be replaced by Speciousness."

Speciousness may be defined as as: "A seemingly plausible but deceptive appearance of truth," that's to say things that sound good or look good but really aren't.

I always considered Nick Bentley to be a master of speciousness. His views on inventing is that games should comply with his ideas of what players want, and if not, that they should be modified till they do. Central to his thoughts are the players and the games he invents should serve their wishes, as seen by him. He's always interested in everyone's point of view, so that his games may serve them better. It's a form of altruism.

Nick often says things that sound good, like "ban the ban" about minimizing restrictions in the design of new games. That sounds good because it appeals to our sense of freedom. He illustrates the point by pointing out two restrictions he was able to remove from Catchup, greatly improving the game. So what's wrong with that?

This: it advises you to correct design mistakes you shouldn't make in the first place. If the point of the article is that you should always minimize the number of restrictions, then it says nothing new. A body of rules inherently is made up of options, restrictions, and obligations, and a good design inherently balances these aspects. "Ban the ban" states the obvious as if it were special and makes it special by giving an example of replacing a restriction that was questionable to begin with. It sounds great and means nothing new. That's speciousness.

Here's the speciousness that Nick is talking about:

"I think great games are unclear; they make it hard, really hard, to identify good moves, but they do something else to make up for it: they excite in the mind ideas for moves which seem good, but actually aren't. This has two important effects:

1. It gives players the needed sense of direction and competence even when they're playing a deep game and in fact have no idea what they're doing.

2. It sets players up to be surprised when they discover their initial ideas were wrong—in other words it creates Eureka moments, which are among the supreme joys of playing a good abstract game. This is only possible if a game stimulates compelling but ultimately incorrect ideas about how to play well. I call this quality 'speciousness'."

The first point clearly addresses new players who play new games, because seasoned players do have a sense of competence and a reasonable idea of what they're doing. So it's not a general observation about players and games. The second point is general and would even hold, if only occasionally, for a game's top players. Great games are full of surprises and seemingly good moves that turn out to be contaminated are certainly part of it.

But how would an inventor implement such a feature, other than working out a good idea in the best possible way and hoping? Let's ask Nick how a game designer might build speciousness into a game:

"I don't have a complete answer, but one thing that helps create speciousness is the use of mechanisms that feel familiar to players. Two ways this can happen:

1. Mechanisms can feel familiar because they're similar to mechanisms in well-known games everyone has played. Example: thanks to games like Connect4 and Tic-Tac-Toe, just about everyone has experience with the n-in-a-row objective. It feels familiar to us, and we therefore have ideas about how to pursue it. If you design a game with an n-in-a-row objective, but whose mechanisms are just different enough to make the strategy conflict with what players already know, you'll have created speciousness. A great example of this is Yavalath, an n-in-a-row game with one little twist that dramatically transforms what players need to do to win. Yavalath's speciousness is a key reason it delights just about everyone, gamers and non-gamers alike from the get-go.

2. Mechanisms can feel familiar because they embody what I call Intuitive Metaphors. These are mechanisms which demand modes of thought familiar not from games, but from real life. So, for example, the idea of chasing down and capturing something (the goal of Chess) is common not just in games, but in life. So too with surrounding something, as in Go."

Yavalath invites you to make a row of 4 without having it preceded by a losing row of 3. Very clever for a game that was actually designed by a computer program. Nick is right about the effect of this little twist. Gary Gabrel's game Pente introduced a similar twist by introducing the custodian capture of pairs of stones in the orthodox concept of "five-in-a-row"—small changes with big consequences.

The second mechanism just states that "real life goals" do well as goals for abstract games. This is both obvious and usual, or at least far from unusual.

So what does Nick actually say about building speciousness into a game? Here is it: (1) Build a little alien twist into an existing game, (2) Choose a natural goal.

Fortunately there are many natural goals, chasing a king, killing all troops, grabbing the most, building the biggest, being there first, unifying pieces, connecting things, blocking the opponent.... So indeed, make a good game and it will most likely have ample options to make mistakes by means of plausible moves. They come with the territory, there's no need for special requirements and no clue as to what these should be in the first place. It all sounds good but means little. A bit specious, so to say.

So what is clarity?

At the BoardGameGeek forum it never became quite clear. The late Richard Moxham whose Morelli is featured at Mindsports, posted an attempt to get an answer in Aprll 2018, less than a year before his untimely death. This is the original post:

"Clarity (noun): In a pure-skill boardgame, a measure of the ease with which (at levels appropriate to players of all abilities) that game conduces to:

1. The making of purposeful moves;
2. Reasonable judgement as to the comparative merit of available options;
3. Evaluation of overall position.

Discuss."

Richard is no longer among us so we'll have to do with comments he made in the thread, starting with a reply by me on the first point that I made:

"One of the better definitions I've seen. But discussions about clarity sometimes lack the very subject so I'm inclined to pass on that one."

Richard responded,

"A pity, though, because a helpful working definition would be very valuable for future discussion. The point is that the clarity which you refer to as often lacking in such conversations (and naturally I agree about that) isn't the same clarity as the one I'm attempting (or, more exactly, launching an attempt) to define."

[...]

"Anyway, as I say, the word clarity, just like the word depth and many others, is at this point still a tabula rasa. People already use it, of course, and different users mean different things by it, but that's not to say that the issue is "purely subjective" and therefore fruitless to pursue. What we should be doing is looking for the meaning which most enables us to make progress in the understanding of these games. Or (to stand that on its head) seeking to identify the important quality and then agreeing to use the label to pin it down. For example, there would be nothing incoherent in someone saying that they see clarity as the ease with which a rule-set can be understood and assimilated. Nothing incoherent, but if we were to agree to let clarity be that for future purposes we would be wasting an opportunity, because there are other potential meanings (and I submit that mine, offered above, is at least the basis for one of them) which would better advance the cause."

[...]

"To sum up, then, you look for the property or properties—consistent with the everyday meaning of clarity, obviously—which contribute most profoundly to the quality of an abstract strategy game, and you attach your word there. It's not an easy task, but it is approachable."

If the search is for a definition of "clarity" as a property of a board game then it means something else than the clarity with which a grandmaster sees a Chess position as opposed to a beginner.

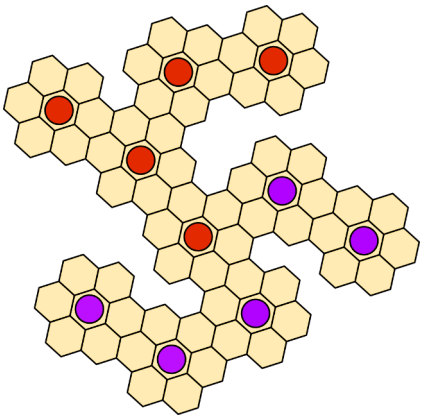
The fact that Chess masters can quickly evaluate a position they've seen for only seconds, seeing where it will go where beginners merely see where the pieces might go, supports the idea that clarity is linked to experience in a game. Of course the game must be able to provide such clarity, as Chess obviously does. So I wonder if a very seasoned player of Epaminondas could do the same in that game, that is reproducing a position after seeing it for a few seconds and, if applicable, seeing the

outcome. I wonder in fact if it might hold for any serious game. In that case clarity equals familiarity, and the search for it as the property of a particular game is a wild goose chase.

Mu versus Hex—a comparison of extremes

I invented Mu in 1980 during a nightly bike ride from the games club Fanaat at Twente University (then still called "Technische Hogeschool Twente") to my home, a distance of about 7 miles. I was high on pot, as usual then as it is now. On arrival I noticed that it had taken me an hour, which is quite long for 7 miles. I also had no clear recollection of the route I had taken. But with me, Mu had arrived.

Mu is one of the most complex games of our kind that was ever invented, if not indeed the most complex one. A move in the middle game may well consist of up to a hundred separate actions. Hex by contrast is one of the simplest games of our kind that was ever devised. Ed and I first played Mu after he had made an app. But he knew about the game ever since its invention because we both frequented Fanaat in that period.



Mu

So I asked Ed if he ever during a game of Mu had felt a sense of loss of direction or lack of strategy. He hadn't. Neither did I for that matter. There are many chain reactions in the game that just need performing, like someone walking up the stairs who clearly sees the purpose and the method, yet has to take every step. Then I asked if he ever had felt a sense of loss of direction or lack of strategy while playing Hex. Turns out we both had felt that particular "opaqueness" very clearly.

Does that mean that Mu has more "clarity" than Hex? For both Ed and me that would seem to be the case, and it is based on familiarity and experience. Show me a Mu position between equally skilled players, and I can quickly evaluate the situation. Do the same with a Hex position and if I'm not indeed wholly lost, then I would certainly be unable to evaluate the position quickly. So what does that say about "clarity as the property of a game"? What are we looking for?

Clarity a function of skill level, or an integral over skill levels?

That is a question that came up, and since Richard proposes that it should be a measure of ease in which a game contributes to making itself clear at levels appropriate to players of all abilities, the answer would be the latter. We seek a property, not a result of progressing interaction between a player and the game. The wish for it is stated explicitly in the thread:

Jeromie: The thing I don't like about this definition is that too much hangs on the skill level of the players. Clarity feels like it should be a property of the game itself, not an emergent property of the game/player interaction."
Russ: I'd like that ideal, but to me it seems like in reality "clarity" (and many similar fuzzy terms, e.g., 'drama' and 'decisiveness') are surely bound to be subjective judgments by individual players. Then any resulting objectivity about them is empirical and demographic, a result of large numbers of players agreeing that 'Game X has high clarity' and 'Game Y has low clarity, it is very opaque....'"
Jeromie: I would describe clarity as a measure of how effectively the game conveys all of the information necessary to make meaningful decisions. Thus, clarity is more about information presentation than the scope of the decision space."
Russ: 'Information presentation' seems to me not at all 'a property of the game itself,' but a property of the graphic design and other such presentation choices made in a particular physical manifestation of the game. For example, in my experience Shogi with kanji characters has significantly less 'clarity' (in the sense of effectively conveying information) for (non-kanji-literate) new players than Shogi with newbie-friendly pieces with little arrow diagrams on them, or with pieces using Hidetachi's Western Chess-inspired graphic design, even though they are all the same game, i.e., Shogi.

History

Why do we feel that clarity should be a property of a game, rather than a property of the vision of a seasoned player?

Jeromie: Has this term come up in other discussions? I'd love to see the history of how it's been used instead of trying to come up with a definition in a vacuum. I'm describing what the word conveys to me based on my understanding of English, but I also understand that all fields have their jargon that can have non-obvious meanings. Do you see clarity as a desirable, neutral, or negative property of a game? In your proposed definition, how would it relate to calculability?
Russ: As far as I know, 'clarity' became jargon-esque in this context thanks to the article 'Defining the Abstract' by J. Mark Thompson in 2000."

That of course is not entirely true. So far as I know Robert Abbott was the first to coin the term as "property of a game" in his 1975 essay "Under the Strategy Tree." It was in a time when there appeared maybe five new games every year, instead of five every day. A new game could make a big splash, and Robert was enchanted by his own words:

"Epaminondas is clear because the magnitude and direction of the forces are shown by the size and direction of the phalanxes. Thus the patterns that develop during the game graphically display the confrontation of power."

And who is to blame him, it sounds perfectly logical. But it isn't. It may be a handle for accessibility but in terms of clarity the game is no different than many other games of a similar kind, in that it doesn't matter. Clarity is not in the game, but in the vision of a player. Clarity of vision is shaped by experience and study.

Conclusion

I'd like to wrap it up in a slogan that is not entirely correct, but it conveys the message in three words:

Clarity is Familiarity.

Christian Freeling, Enschede, July 2021

Mark Steere Games: A retrospective

by Kerry Handscomb and Mark Steere

Mark Steere has been designing games for nearly 30 years. He has created a substantial collection of games, several of which have become well known in the world of abstract games. Many of his games are highly original, even counter-intuitive in the way that he reinterprets and recombines ideas. The designer's games embody a pure philosophy of game design. Mark Steere, himself, is an original—he brings to the field a unique perspective that deserves to be understood and appreciated.

I caught up with Mark in Mongolia, where he has been living since 2019, trading time between an apartment in Ulaanbaatar and his cattle ranch in northern Mongolia. Mark returned to game design earlier this year, with a plethora of new games. We struck up an email conversation about his new games Zola and Gopher, and I asked him about 10x10 Mongolian Chess, Hiashatar. Mark writes,

"I played Zola and Gopher with my lawyer. When he won, he was smiling. When he lost, he wasn't. He said he likes Settlers of Catan. I played my driver at Zola and Gopher and he looked pained. He said I should design a good game, using Mongolian tiles. I've never heard of Mongolian Chess. I've only seen International Chess in the stores."

My interest in Hiashatar remains, and I hope eventually our investigations may bear fruit in Abstract Games.

For now, my intention is to discuss the designer's games and his thoughts about game design more generally. The collection of games I have chosen to highlight constitutes a very selective retrospective of Mark Steere games. These games jumped out because they are interesting in their design or interesting because of their strategy and tactics. Of course, other games by Mark Steere may also have desirable features, and the selection is not intended to be a list of his best games. Mark's comments interspersed throughout are lightly edited extracts from our email communication.

The oeuvre

Mark Steere lists more than 50 games on his website, which I have re-ordered on the next page according to their year of design. The brief descriptions are mostly taken from the website, but I have supplemented the descriptions here and there.

The first of Mark Steere's games, Quadrature is about pattern-forming to capture opposing pieces. Mark discovered the game could be drawn, which he perceives as a flaw. All his games since Quadrature have been designed to be finite and drawless. Tanbo, originally called Rootbound and played with a Go set, followed in 1993.

After the start with Quadrature and Tanbo, Mark designed no new games for some years. Then, he entered a long and prolific period of game design from 2003 to around 2012. Cephalopod, from 2006, a game using dice as pieces, has keen players on Boîte à Jeux, and may be the second best known of Mark's games. Easily the most popular and influential of his games, Oust, came out in 2007.

After 2013, Mark's output of new games slowed. Aside from the connection game, Gyre (2015), Mark produced no new games until 2021. According to the designer,

"Michael Amundsen contacted me about Cage to see if his understanding of the rules was correct. Reading the Cage rule sheet didn't refresh my memory. It was totally gone. But our discussions inspired me to end my eight-year hiatus from game design. I cranked out Zola and seven other games in about as many weeks."

The games in this selective retrospective are given in chronological order below, his earlier games first. As I mentioned above, the selection does not imply a particular ranking or that these are necessarily the very best of the designer's games. They stood out for one reason or another and the choice is subjective. Nevertheless, I have played these games, and I can attest that they all have interesting features illustrating various aspects of Mark Steere's philosophy of game design.

Byte

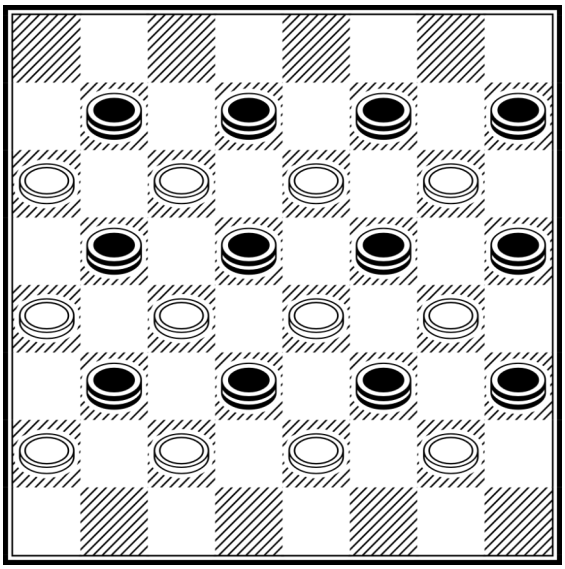
One of Mark's design principles is that his games should use generic equipment. He wants his games to be as accessible as possible. You can see from the ludography below that many of the games are playable with a checkers set or a Go set. Even those games that need something more than one of these basic pieces of equipment usually rely on the simplest materials that most gamers have—hexagonal or squared boards of various sizes and pieces of one type, usually checkers.

Byte, one of the earliest Mark Steere games, uses nothing but a checkers set. Byte is a clever and unusual stacking game. Byte is still playable on SuperDuperGames, although I do not think it attracts much attention these days. Many other good games use nothing but a checkers set—Boom & Zoom from *AG21*, for example. Byte deserves to stand with the best of these games, in my opinion.

Only the dark squares are utilized. Checkers can move onto other checkers of either colour, and stacks will form. No stack can have more than eight checkers. As soon as a stack of eight checkers is formed, it is captured by the player whose colour is on top. With 24 checkers, there will be three stacks. The objective is to win two of the three stacks.

Even before we go to the rest of the rules, it is worth noting some of the structure of Byte: three stacks of eight checkers; each stack must be won by one player or the other so the game is

decisive; even games with one stack won by each player will come down to a sharp endgame as the final eight pieces unite to form a stack. I think Mark would agree that these features of Byte are good "architecture"—see Oust, below, for a bigger discussion of the meaning and importance of architecture in Mark's games. Three stacks of eight is a simple way to make a decisive game from a checkers set.



Byte opening position

Here are the rest of the rules. One player takes the white checkers, the other the black checkers. White moves first, and thereafter the players take turns to move. If a move is available, you must move; if you have no move available, your opponent continues until you can make a move.

On a turn, a player can either slide a stack or merge a stack. (A single checker in a square is a stack of one.) Two stacks next to each other may merge. If you have a checker in one of the stacks, you may lift this checker along with any other checkers on top of it, and place this "sub-stack" on top of the stack it is adjacent to. There are two restrictions: firstly, no stack may be formed greater than eight checkers high; secondly, your checker at the bottom of the "sub-stack" you are moving must end up strictly higher than the position it started from. Merging is the only way stacks can be split.

Otherwise, you can slide a stack to the next space, provided one of your checkers is at the bottom of the stack. Stacks must be slid as a whole, without breaking them up. When sliding a stack, the stack must be moved in a direction that reduces the distance between the sliding stack and the closest other stack, measured by the number of sliding moves between the two stacks. If two stacks are of equal closest distance away, you may decide which one to move nearer to. If a stack is already adjacent to another stack, it may not be slid, because its distance to the closest stack is already minimal—its only option is to merge.

The distance mechanism to constrain move options is a theme that runs through many of Mark's games, whether distance between pieces, as here, or distance from a certain point on the board. We will review this point more thoroughly below in the discussion of Monkey Queen and Zola. I think it is fair to say that the distance mechanism is one of the primary ways in Mark Steere games to guarantee a decisive outcome.

As indicated above, as soon as a stack of eight checkers is formed, it is removed from the board and scores one point for the player with the checker on top. The first player to capture two stacks in this way is the winner.

Mark Steere Games

Quadrature (1992) (Reversi-like squaring mechanism)
Tanbo [orignally Rootbound] (1993) (Go set, adjacency rules)
Impasse (2003) (checkers set, armies march through each other)
Byte (2005) (checkers set, stacks, move distance, merging)
Cephalopod (2006) (territory, dice as pieces)
Copolymer (2006) (multiple cells per turn, adjacency rules)
Diffusion (2006) (standard mancala set)
Nested Y (2006) (connection game, nested boards)
Scribe (2006) (pattern making)
Crossway (2007) (Go set, square connection game)
Dipole (2007) (checkers set, merging, stacking, attacking game, annihilation)
Oust (2007) (board starts empty and ends with only one colour, adjacency rules)
Palisade (2007) (Go set, territory)
Rush (2007) (Go set, multiple stones added each turn, adjacency rules, Go -like)
Anchor (2008) (triangular board with two triangular holes, connection game)
Anchor 3D (2008) (3D connection game)
Atoll (2008) (a game of perimeter islands, connect islands of your colour, connection game)
Begird (2008) (generalized form of Y, connection game)
Blood Diamonds (2008) (online play)
Lariat (2008) (very simple 3D connection game)
Super Lariat (2008) (3D connection game, unusual geometry)
Loophole (2008) (rhombus-shaped board with two rhombus-shaped holes, connection game)
Loophole 3D (2008) (3D connection game)
Mobius (2008) (connection game, Moebius strip board)
Variable Trump Tute (2008) (card game)
Basic (2009) (checkers set, mixed stacks, stacking)
Mosaic (2009) (tile game, territory, adjacency rules)
Grand Hex (2009) (Hex with an added complication, connection game)
Hex KB (2009) (connection game, Klein bottle board)
X (2009) (connection game for three)
Cage (2010) (checkers, centre move distance)
Colonnade (2010) (stacking, one dimensional)
Fractal (2010) (beautiful board designed to minimize first move advantage, connection game)
Flume (2010) (territory, dots and boxes)
Jostle (2010) (adjacency rules)
Mad Bishops (2010) (annihilation, adjacency rules)
Mad Rooks (2010) (annihilation, adjacency rules)
Rive (2010) (high churn rate, adjacency group rules like Oust)
Monkey Queen (2011) (stacking, chess variant)
Marvin (2012) (stacking, territory)
Redstone (2012) (Go set, Go-like, invulnerable red stones)
Trivor (2012) (connection game, trivalent, variable orientation cell division)
Tripen (2013) (connection game, trivalent, variable orientation cell division)
Gyre (2015) (surround the centre, connection game)
Anaash (2021) (stacking, annihilation, move distance)
Bamboo (2021) (clumps)
Dodo (2021) (simple rules, no moves possible for the goal)
Gopher (2021) (simple rules, adjacency rules)
Inchworm (2021) (stacking, merging)
Kobudai (2021) (checkers set)
Manhattan (2021) (consolidation, Manhattan distance)
Marmot (2021) (territory, Gopher variant)
Pathway (2021) (combinatorial, like Gopher, adjacency rules)
Zola (2021) (distance from centre, simple, robust, strategic)

There are some obvious first points to note about Byte strategy. When you merge stacks with the bottom checker of a stack, you lose a stack that you control. Obviously, you have no choice but to merge stacks in this way at the start of the game, but generally you want to keep as many stacks on the board as possible with your colour at the bottom, because it will help to keep your options open.

On the other hand, when merging stacks to reach eight high, the moving stack of checkers needs your checker on top for you to win. It is also important, therefore, to have stacks with your own checkers on top. However, you will quickly find that when two stacks face off, the stacks with checkers on top will not always win. The winner depends on the particular colour distributions in the two stacks, and you need to be sure to read out the outcome before moving these two stacks together. Overall, I think it is more important to have checkers at the bottom of stacks rather than the top.

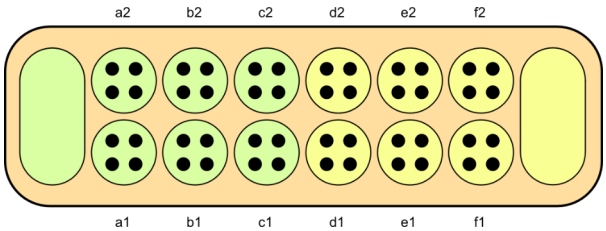
Ralf Gering has some interesting analysis of Byte endgame strategy here in BoardGameGeek. He deals with the situations that can result when stacks face off to create the third and final eight-stack of the game, although his analysis works whenever two stacks face off earlier. Ralf's analysis is what opened me to the interest of Byte. It is a game that has excellent internal structure, perfectly utilizing a checkers set to create a decisive, unusual stacking game.

International Byte is a scaled up version of Byte, played with the 10x10 board and 40 checkers of International Checkers. The objective now is to be first to capture three of the possible five eight-checker stacks. Otherwise, the rules are the same.

Diffusion

Diffusion is Mark Steere's interpretation of the mancala games. Diffusion is not another version of an existing type of mancala game, but rather a game with unusual objective and manner of sowing the seeds around the board. The starting point for Diffusion is a 2x6 mancala set, with the typical outsize holes for captures at either end. As mentioned above for Byte, one of Mark's design criteria is that his games should use generic equipment. Diffusion is an alternative use of the most common and generic type of mancala equipment. Diffusion is playable on SuperDuperGames.

The board and starting position is shown below. The holes do not have to be differently coloured, and a regular mancala set will do just as well. The colours are useful to clarify some of the special characteristics of Diffusion.



Diffusion board and starting position

Diffusion is a game for two players. One player owns the left side of the board (green above); the other player owns the right side of the board (yellow above). The objective is to empty of seeds the six round holes on your side of the board. As soon as you accomplish this, you win.

On a turn, a player picks any of the round holes, lifts all the seeds from this hole, and sows these seeds one by one in other holes, just as with regular mancala. However, the sowing starts in the hole immediately to the right of the hole emptied of seeds, and proceeds around the hole emptied of seeds in a counter-clockwise direction. Thus, the seeds from **c1** at the start would be sown in **d1**, **d2**, **c2**, and **b2**. If there were 5 seeds in **c1**, the last seed would fall into **b1**. No hole (aside from the capturing hole at either end) can have more than 5 seeds. A player starting from **c2** instead would sow into **b2**, **b1**, **c1**, and **d1**. And so on.

The capturing holes at either end count as two holes for sowing seeds. For example, a move starting from **a2** would sow two seeds into the green capturing hole to the left, and then one each in **a1** and **b1**. The capturing holes at either end accumulate seeds throughout the game. No move can start from the capturing holes.

When in the course of sowing, a seed would fall into a hole causing it to have 6 seeds, this seed instead is placed into a capturing hole (which capturing hole is irrelevant), and sowing continues from the next hole. To repeat, no hole can have more than 5 seeds.

Remember, you can move from any of the 12 round holes that contain seeds, not only those on your side. However, you win immediately by emptying your own 6 round holes of seeds.

Ever since he discovered the possibility of a repetitive position in Quadrature, Mark has striven to make sure his games are necessarily of finite duration and drawless. Perhaps the drawlessness of his games is his most consistent design motif. It is not immediately obvious that Diffusion is drawless. Is it possible for seeds to be recycled back and forth endlessly? The answer is, No. However many seeds are in a hole, when these seeds are lifted and sown, one seed must be moved to the hole to its immediate right. Every possible move has this quality. Eventually seeds must inevitably shuffle off into one capture hole or the other; eventually the game must cycle to a conclusion.

Assuming you are playing the green holes above. There are four ways in which you can cycle seeds out of your six holes. The first is to move them into the left capture hole from **a2**; the second is to move them into the opponent's holes from **c1**. Thirdly, with at least four seeds in **a1**, you can also cycle seeds into the left capture hole; lastly, with at least four seeds in **c2**, you can cycle seeds into your opponent's holes. Two seeds in **a2**, for example, will bury two seeds in the green capture hole; likewise, two seeds in **c1** will enable you to move two seeds into your opponent's holes (and none into yours). Of course, your opponent is trying similar manoeuvres. The person who most efficiently cycles seeds out of his side of the board will win.

There are two possible strategies: aim to bury seeds in your capturing hole or aim to recycle seeds to the opponent's side of the board. Neither strategy alone is likely to succeed, and you will need to balance the two.

Each of the holes has an efficiency rating for you, depending on how many seeds it contains, and how well it can cycle the seeds out of play or onto the opponent's side. Suppose, for example, **c1** contains 1 seed and **d1** and **d2** are empty. You can move from **c1** to **d1**, placing a seed on the opponent's side, furthest from being moved out of the game by the opponent or recycled back to your side. On the other hand, if **c1** contained 2 seeds, while **d1** and **d2** were still empty, a move from c1 would place seeds in **d1** and **d2**—ready from **d2** to be recycled straight back to your side! The first option is more efficient for you than the second option.

I do not pretend to understand the details of Diffusion strategy and tactics. However, I am sure that this kind of thinking is on the right track. Diffusion is a mancala game, but the recycling of pieces, and maximizing the efficiency of this recycling, is different from other mancala games. There is a rhythm to a game of Diffusion, with the seeds cycling back and forth. The endgame is sharp and interesting.

We already confirmed above the drawlessness of Diffusion, and mentioned Mark's major design criterion of ensuring his

games are always finite and decisive. Aside from ensuring the games are drawless, however, we need them also to have interesting tactics and strategic options. Shogi and Go have interesting tactics and strategic options, although neither satisfies at least one of Mark's design criteria: they can be drawn. I asked Mark for his opinion of games like Shogi and Go that can be drawn, given his contention that drawlessness is a paramount quality of games. His answer deals also with a key point about the playability of his games:

"There's an assumption that, as a game designer, I probably have some appreciation of the classics. And I do, in a way. But I totally don't understand them. When I say I'm a way below average player of games, this isn't false modesty. I tried to learn Go a few times, because of its history and tradition and mystique—and because well meaning friends were always recommending it. But my attempted foray into Go only established that it's well beyond my grasp. In Chess and its variations, I get caught up in little local things, and I don't see the forest through the trees. Now, after playing Zola many times, I can see that there's something to it. I know I'll never be good at it, but I also know that skilled players can advance their strategy without bounds. If they ever wring out Zola on a size 6 board, it's scalable, so they can advance to a size 8. That reminds me. One more criteria for games of the highest form: scalability.

"But my strategy blindness is why my philosophy only relates to architectural interest with no consideration of ensuing tactics or strategy. I do have a deep appreciation of games, but it's like standing outside a car showroom and admiring the cars with no intention of actually driving them. If my game luckily turns out to be strategic, yay, I'm all for it. It's just not what drives me from the outset. Now, that being said, I think my odds of developing a strategic success are about the same as other designers who are trying to do it. I call Christian Freeling the 'game whisperer' because he seems to have the insight required to tweak variations of Chess and Checkers into strategic games. But other than Christian, I really don't know of anyone who can do it without a big helping of luck, just like me."

I think here Mark is referring to the fact that for him, game architecture is paramount. Shogi and Go may well be great games, although he will never be able to judge them properly. He has the humility to admit, in fact, that he will never have the skill to judge the quality of his games properly in terms of their actual playability. All he can judge adequately is a game's architecture, and drawlessness is good architecture.

Oust

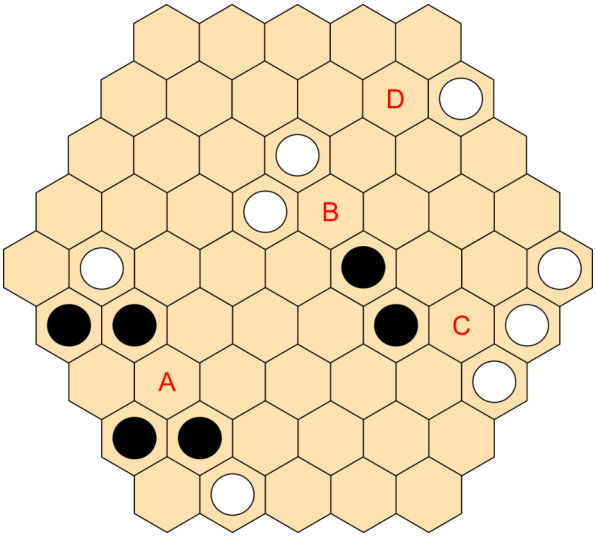
Oust is certainly Mark's most influential abstract game. I would guess that Oust has been studied and played more than all his other games put together. Oust can be played on a squared board, up to the size of a full Go set, or on a hexhex board with base-7 standard, although other sizes are possible. The sense in the abstract games community seems to be that Hex Oust is the better game, but I do not think there is certainty on this point. (See, for example, the discussion thread here on BoardGameGeek.)

You need a collection of black and white pieces, and of course Go stones are ideal. The board in Oust starts off empty. The players take turns to place stones in vacant board spaces, and it does not matter which colour moves first. The objective is for one player to capture all the opponent's stones. A collection of stones of the same colour that is connected (as in Go or Hex) is a group.

A non-capturing move is placement of a stone that does not connect to any friendly stones already placed on the board, and therefore does not extend any friendly groups. The non-capturing move can connect with one or more enemy stones.

A capturing move is placement of a stone that does connect to one or more friendly stones and does extend a friendly group or even unite two or more friendly groups. A capturing move is only possible provided that the friendly group so extended does thereby connect with one or more enemy groups and furthermore that these enemy groups are strictly smaller in size than the friendly group so extended. These one or more enemy groups connected to by the extended friendly group are captured and removed from the board.

After a capturing move, a player may make another capturing move in the same turn, and so on, until the player's turn ends with a non-capturing move. It is not required to make a capturing move when one is available. For example, below, Black can play **A**, uniting two groups and capturing the two isolated white stones next to them. Black can then play **B**, capturing the two-stone white group, and then **C**, capturing the three-stone white group. Black could not play **C** then **B** instead. Lastly, Black could play **D**, making a non-capturing move, even though it is adjacent to a white group. (This is an example for the rules only, and not a demonstration of good play!)



Examples of Oust capturing

You can see, even from the simple example above, that a player can grow groups by capturing a series of smaller enemy groups. Indeed, it is possible in Oust even to be reduced to a single piece and come back to win, provided all the enemy groups are small and weak. You may even want to avoid captures, if it means creating small, weak groups.

Oust rules proscribe certain possibilities and limitations depending on adjacency rules. Thus, the last piece of a move must be adjacent to no friendly pieces; otherwise, if a move creates an adjacency between a larger group and a smaller enemy group, the smaller group is captured. Many of Mark's games depend on adjacency rules, which will be discussed more fully under Flume, below.

Oust's simple rules are in a way completely obvious. You create a new group on any vacant space, even a space next to an opponent's stone. The point is that your own groups can only grow by destroying opposing groups. If a group can expand through many captures it can become large enough that it is invulnerable and can crush any opposition, ending the game.

One of the key points of Oust opening strategy is to try to force your opponent to create many small groups. Sacrificing stones to force the creation of small opposing groups is a common opening tactic. Having said that, a second key point of Oust strategy is that you should only capture (and thereby expand

your groups) when you have to. Keeping the board full of small enemy groups reduces the enemy's options until the enemy has no option but to make forced errors. Forced errors are moves allowing more stones to be captured.

If both players are following good Oust strategy, the opening will end with a large number of small groups of both colours. Then one or both players must make forced errors, and certain groups expand through capture to dominate sections of the board. Eventually, one behemoth will eliminate all opposition.

The flow of Oust is magical, from an empty board, to the creation of many weak groups, to the combat between these weak groups, to their gradual assimilation into larger and larger groups, and to final domination by the largest group. The character of the game is utterly unguessable from the rules themselves, and only emerges through play and subsequent reflection. If any Mark Steere games are played in 500 years, my guess is that Oust will be one of them.

An excellent resource is "The Oust Strategy Guide," which demonstrates some of the richness of Oust, both tactically and strategically. A key part of Oust tactics is the manner in which you attack weak groups to grow your own groups most efficiently. "The Guide" has some suggestions in this regard, but I am certain that there is much more waiting to be discovered. Oust can be played on SuperDuperGames and Mindsports, and also in Ludii and Ai Ai.

Mark defines his highest form of game in the following terms, clearly including Oust in this company, and starting with his key measure of game quality, its architecture:

"Oust is an architectural goliath. Something I had never heard of was a game that starts with an empty board, is played with two colours, and finishes with one colour. So that became a puzzle for me—which I solved with Oust. My designs are driven solely by architectural interest. If they turn out to be fun, I got lucky. Maybe 5% to 10% of my games have quality gameplay. Oust is one of them.

"Architecture is just the 'wow factor' of a game's rule set as something to behold, with no consideration of the ensuing gameplay. The design should be clever, simple, unique... and beautiful. The game shouldn't just be based on a new mechanism or principle. It should itself be a new mechanism or principle. Zola is one of my best architected games. At first it isn't obvious why annihilation must happen. Then it hits you. 'Oh, I get it. The checkers end up in the corners, and from there it's a straight line of attack to the other corners.' Boom! Architecture.

"Fractal is high on my architecture list. Just one look at it and Boom! Architecture. Gyre has outstanding architecture. It's a pure geometric principle, like Hex or Y, but arguably even simpler.

"And of course Oust. Just the beauty of its mechanism. Starting with an empty board and guaranteeing annihilation. It's otherworldly. Incidentally, finite annihilation is the highest form of a game. By finite I mean two things. Naturally finite with no need of superko or the 50-move rule. And hard finite. You can't have a cycle even if you want to.

"Tripen seems to have interesting architecture. I don't even remember from 9 years ago why it works or how it works. Mad Rooks is nicely architected. Super simple, all out massacre. Other designers have since incorporated its principle in their games. Monkey Queen is pretty awesome. It has rightfully received a lot of compliments over the years. Redstone was well designed. For me, Redstone was nothing more than a solution to a problem—how to make Go naturally finite. Not to diminish Redstone. That's a lot. But as with most games, including my own, just knowing the rules is satisfying. Gopher's sheer simplicity is remarkable.

"For me, game architecture is closely analogous to building architecture. Like the MahaNakhon in Bangkok. Wow!"

The MahaNakhon skyscraper in Bangkok

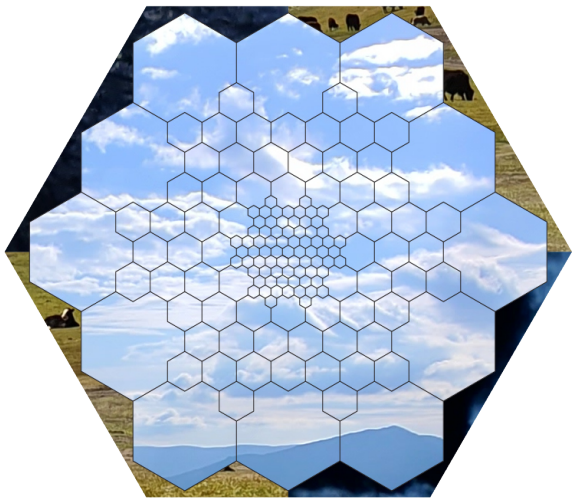
Mark reiterates the necessity for drawlessness for good architecture in the strong sense that cyclical situations cannot be constructed even if both players want to. In addition, his ideal game is a combinatorial game of perfect information. Significantly, the objective of the ideal game is annihilation, as with Checkers, or with Oust. These are all aspects of a game's architecture. The "wow factor," however, and the comparison with physical building architecture implies that architecture has an artistic as well as a technical-utilitarian meaning. Of the games that Mark mentions specifically above, we will discuss Fractal, Monkey Queen, Redstone, and Zola below. Here first is Fractal.

Fractal

FractaI is high on the designer'' list of games with great architecture. Fractal is a hex-like connection game designed to reduce the advantage of playing first, but without use of the pie rule. The board design, shown below, utilizes a fractal pattern. The reason for highlighting Fractal here, selected from among all of Mark's many connection games, is the brilliance of the board design.

The board starts empty, and the players take turns to occupy a space with a stone of their colour. The objective of Black is to connect outside spaces that are next to the dark border; the objective of White is to connect outside spaces that are next to the light border. (The border, by the way, illustrates rural scenes from Mark's adopted home, Mongolia.) Some of the spaces have connections to both light and dark borders, similarly to corner spaces in Hex.

We need no other rules—the rules are simply those of Hex.



Fractal board

Normally in Hex, the central spaces are more valuable than edge spaces, because central spaces offer more options for creating connections. This is not the case in Fractal: edge spaces are larger, and possibly more valuable that central spaces.

One of the key features of good games, according to Mark, is scalability. Oust, for example, is highly scalable, and International Byte is a scaled up version of the regular game. Diffusion, too, has a larger variant based on 2x8 holes, although I think the game would be somewhat distorted thereby, not worse, but different. I wonder, too, about the scalability of Fractal. How would it play with a fourth fractal level? I can easily imagine playing Fractal with three levels in physical form, but a fourth level, with tiny central spaces, would probably be unplayable in physical form.

Fractal is one of many connection games that Mark has devised that are inspired by Hex or are otherwise generalizations of Hex. I am not much of a Hex player, and I do not feel able to comment on these games. Nevertheless, as I mentioned, the design of Fractal is different and original, and hence its inclusion in this selective retrospective.

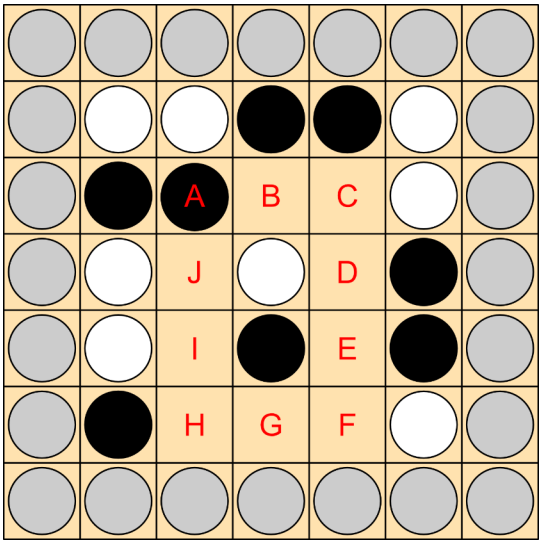
Before leaving the topic of connection games entirely, we should note that Mark has three three-dimensional connection games, Anchor 3D, Lariat, and Loophole 3D. Hex KB (where "KB" stands for "Klein bottle") is effectively a fourth multi-dimensional connection game. These original ideas deserve investigation. Proper study of these games ought not to be hampered by the difficulty of creating a physical set, provided adequate electronic representations are available.

Flume

Flume is a game like the pencil-and-paper classic Dots & Boxes. Flume has hexagonal and square versions. I do not know which is best, and so here is just the square game. Play on a board with an odd number of squares on each side. The outer ring of squares can be filled with neutral pieces, although you do not have to use neutral pieces. The neutral pieces simply help to indicate that a square on the edge or in a corner already has one or two or filled neighbours, respectively. Without the surrounding wall of neutral pieces, you just have to remember this fact—really no more difficult than remembering that a Go stone on the edge has three liberties and a Go stone in the corner has only two liberties—and your board then is two squares each way larger!

The players take turns to place a piece of their colour on an empty square. Before too long, some squares will acquire three or four orthogonally adjacent neighbours, being thereby "surrounded." The colour of the surrounding pieces, black, white, or grey, is irrelevant. If a player places a piece on a surrounded square, that player must now place another piece of his colour. The second piece, too, may be on a surrounded square, and so on. There is no obligation at any time to occupy surrounded squares, if they exist, but when you do, you must place another piece somewhere else, if you can. A player's move finishes with a placement that is not on a surrounded square. As soon as the board is completely filled, the game ends, and the player with most pieces on the board wins.

See the example below, where Black has just placed **A**. White can in turn take squares from **B** to **J** (or from **J** to **B**) and win the game 17 to 8.



Flume example

The moves in Dots & Boxes are to the sides of squares, whereas the squares themselves are captured. In Flume there is no distinction between making a move and capturing a square, either way a piece is moved to occupy an empty square. As simple as Dots & Boxes is, therefore, Flume is even simpler.

I mentioned above the fact that Oust depends on adjacency rules. Flume is absolutely a game of adjacency rules. For the design mechanism of adjacency rules, the actions of pieces, the possibilities for movement and capture or for occupation of spaces, are constrained by adjacency requirements, between stones on the same side or between opposing stones. Games like Copolymer, Rush, Jostle, Mosaic, Mad Bishops and Mad Rooks, and Gopher all make use of adjacency rules. Crossway prohibits a particular adjacency pattern.

I would guess that Flume and Dots & Boxes are closely related and that much of the deep theory about Dots & Boxes can be adjusted for Flume. Dots & Boxes, after all, does have deep theory, as can be attested to by the strong players on Little Golem, for example.

The author himself thinks Flume is one of his best games, certainly his best territorial game—which is the reason Flume is included in this selective retrospective. Surely Flume is as good as Dots & Boxes, although I have yet to penetrate the strategy of either.

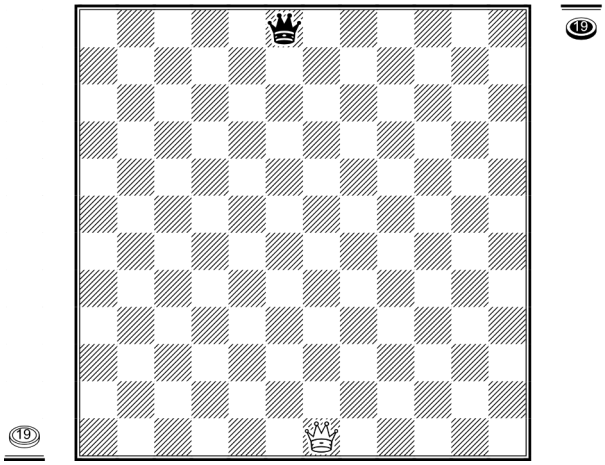
Flume is playable on Ludii.

Monkey Queen

In Monkey Queen, the objective is to capture one key piece belonging to the opponent. In this respect, it shares the objective of Chess, and might therefore be classified as a chess variant. However, Monkey Queen is very much a stripped-down version of Chess, much like the game Chad by Christian Freeling, where only the most basic elements of a chess-like game are preserved.

In his original rules, Mark uses a 12x12 squared board and two stacks of checkers, 20 black and 20 white. I think the physical game is better played with two Queens and a collection of 19 checkers (or pawns) each, and with Mark's agreement, I have reformulated the rules in this respect. The starting position is shown below.

The image of the MahaNakhon skyscraper in Bangkok by Kyle Hasegawa was originally posted to Flickr (https://flickr.com/photos/12588965@N02/28485059256). It was reviewed on August 29, 2016 by FlickreviewR and was confirmed to be licensed under the terms of the cc-by-2.0.



Monkey Queen starting position

Each player starts with a Queen on the board and a stack of 19 checkers off the board. White moves first and thereafter Black and White take turns to move. The pie rule is used. After White's first turn, Black has the option of switching colours and taking the white pieces for the rest of the game.

The Queen (a.k.a., "The Monkey Queen") moves like a Chess Queen, any number of vacant squares orthogonally or diagonally. Every time the Queen moves without capturing, the Queen leaves a "Baby" on the square just vacated. A Baby consists of a checker of the player's colour, placed on the board from the stack off the board. As the Queens move around the board, each Queen will create an army of Babies for defence and attack. Each Baby, too, moves just like a Chess Queen.

The Queen also captures like a Chess Queen. The Queen captures an opposing Baby or Queen within its movement range by replacement. When capturing, the Queen does not deposit a Baby on the square it just vacated. A Baby is left only with a non-capturing move. If a player has no Babies left off the board in reserve, the Queen is not permitted to make a non-capturing move.

The Babies likewise move and capture just like Chess Queens. However, if a Baby makes a non-capturing move, it must move closer to the enemy Queen, where the distance between the Baby and the enemy Queen is measured as the straight-line distance.

There is never any requirement for a Queen or Baby to make a capturing move, except if no other moves are available.

The objective is to capture the enemy Queen. A player may not pass. If a player has no moves available, the player loses.

Monkey Queen is unlike many Mark Steere games in that there are immediately and obviously strategies available to try. The initiative is crucial. We started thinking about mating nets, where the Queen drops a series of Babies to surround the enemy Queen. Otherwise, the Babies can be used defensively, with the Queen "castled" behind a barrier of friendly Babies.

Note that Monkey Queen is another Mark Steere game that uses the notion of distance to restrain move options, as with Byte above and Zola below. Again, with Monkey Queen, the distance mechanism is used to guarantee that the game will end decisively after a finite number of moves.

We have already noted above Mark's claim that annihilation games are the highest form of game, with the cleanest most basic and visceral objective. Monkey Queen requires the capture of one special piece and is a chess variant in this respect. Other classes of games we have already mentioned are the connection game Fractal, the territory game Flume, the mancala game Diffusion, and so on. I was interested in whether Mark set out to create games belonging to each of the major traditional categories or whether there were themes he liked to return to over and over. He responded as follows:

"*There's no particular class of games that stands out for me. They each shine in their own way. Probably the most nearly perfect are connection games, if you can look past the pie rule. They're the purest, being little more than a geometric concept. I don't think there's much left to discover in the way of ultra simple connection games after Gyre and Lariat, but you never know.*

"The Checkers jump has been used so much that it's kind of a cliche. But I have used the jump, and elements of Chess. The King and Queen are generic enough that I don't mind using them. Monkey Queen is clearly Chess related, having checkmate, but I think that's the end of the Chess variant line for me.

"The alignment goal has also been used a lot. But... if I could find a way to make a decisive alignment game, I'd do it.

"Games can be semi-territorial. But if it's pure territory where you're adding up cells at the end to see who won, that could be non-decisive (unless the rules somehow preclude ties).

"Elimination, yes. I really like a game to be a fight. There's nothing like killing enemy pieces, especially when it leads to total annihilation.

"The only theme I can think of in my games is simplicity. Simple rules and simple equipment. I never use more than one type of playing pieces in a game, with the exception that I wouldn't mind having a game with some subset of kings, queens, and pawns. I didn't realize that I already had such a game in Monkey Queen until you mentioned that it could be played with Queens and Pawns. Nice to know.

"Games that have made a big impression on me include Reversi, Hex, Amazons, and Breakthrough. I never intended to fill out game categories."

Monkey Queen is not a standard Mark Steere game in that strategic choices are immediately apparent, rather than opaque or hidden. Of course, our ideas about mating nets, castling, and so on, may need to be altered or supplemented following more experience at Monkey Queen. Either way, it is a good game that will certainly reward experimentation.

Redstone

I wrote about Redstone in the print version of *AG21*. This article is reproduced here, and I will supplement it below with a few additional comments.

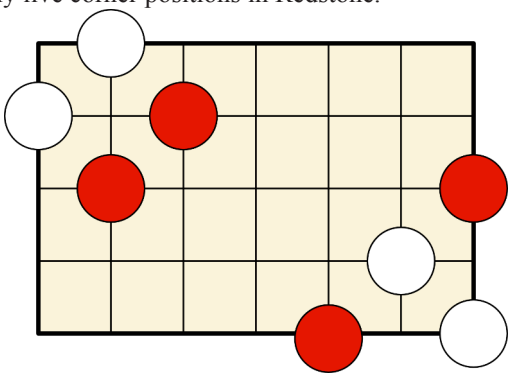
The first thing to note about Redstone is the emergent objective. On paper, the objective is to capture all opponent's stones. With a Go-like game, and the creation of eyes, we must therefore rely on the opponent having to fill in his own eyes before a "live" group can be captured. At first, you might think that a larger territory would be the goal to aim for. However, the emergent objective instead is to make as many one-point eyes you can make in live groups. It makes no difference whether an eye consists of one point or more, because either player can fill in the remaining points, and even if stones are captured thereby, it does not matter, because no points are awarded for captured stones.

When the number of eyes is significant, it matters how many eyes can be made from any particular territorial shape. First theories of Redstone should investigate which shapes provide two eyes, which ought to be somewhat the same as in Go, although the red stones do alter Go tactics. Then, which shapes can provide three eyes, four eyes, and so on?

For this reason, I doubt that 19x19 is the best size for Redstone, because the larger territories that develop on the larger board will still need to be divided into a specific number of

eyes—it does not matter how many points of territory are contained therein. Perhaps 13x13 might be the best size, although we do not have sufficient experience with Redstone to make a good judgment in this respect.

Let me supplement the Redstone discussion with one last point for now. See the diagram below, which shows two minimally live corner positions in Redstone.

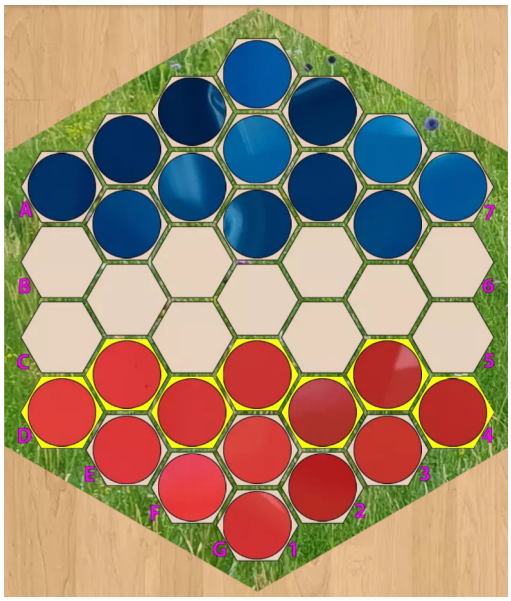


Minimal live corner groups in Redstone

These beautiful positions set the seal for me that Redstone is a game worth investigating. The physical play of the game itself has an appeal in addition to the already gorgeous Go aesthetic. A red stone brings to mind a drop of blood at the kill location. Perhaps this mini-narrative should not carry much weight, but I do wonder what it would be like to play Redstone with traditional glass stones in black and white—now supplemented with red glass stones.

Dodo

Dodo is one of the two recent games by Mark Steere that is covered in this retrospective. The other is Zola, below. Dodo is here because it is another example of an interesting Mark Steere game of extreme simplicity. Dodo can be played on BoardGameArena and Ai Ai. The starting position is shown below, which is a screenshot from the BoardGameArena implementation of Dodo. The yellow highlights behind some of the red pieces are present just to indicate which pieces can make the next move.



Dodo starting position

One player takes the red pieces, the other the blue. Red moves first, and turns alternate. A piece in Dodo can move either directly or obliquely forward, never backwards. You have to make a move if you can. If on your turn to play you cannot make a legal move because your pieces are blocked, you win. And that's it! Dodo has extremely simple rules.

The strategy of Dodo is potentially interesting. You have to open up channels between your pieces to allow enemy pieces to move through them. You definitely do not want to block the movement of enemy pieces! One choice is to move your pieces to the sides and allow enemy pieces to flow through the centre. Another choice is to occupy the centre and send enemy pieces down the sides. I do not know which option, if either, is best.

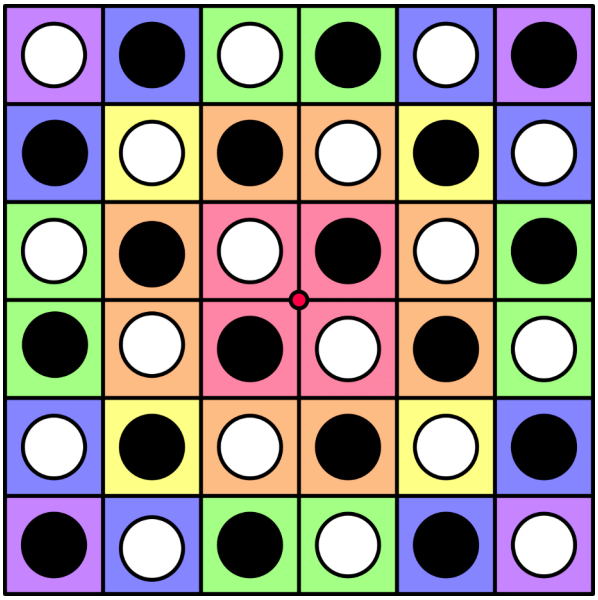
I suggested to Mark the possibility of using a larger board, with more space and more strategic choices. Like many of his games, I think Dodo is scalable. Perhaps a larger version of Dodo would provide more strategic options.

Dodo looks almost childish, it is so simple. However, I think this appearance is deceiving, as you will see after playing just one or two games. Dodo often presents clear move choices, where it is by no means certain which is the best option. Some observers have suggested that there might be a simple winning algorithm for Dodo. I am not sure. Dodo may be more complex than it first seems.

One of the interesting things about Dodo is that the objective seems almost counter-intuitive. Normally, one would expect the objective to be to deprive your opponent of moves, rather than yourself. However, if you try the "misère" version, where the objective is to leave your opponent with no moves, then you see that the game is perhaps not as effective, because the pieces quickly get snarled up in a standoff. The objective of not blocking your opponent seems to lead to a richer gaming experience, which is curious.

Zola

The last of the games in this short and selective review of the Mark Steere games is Zola. Initially, Mark used a checkered board for the setup, but after a little experimentation we decided it might be better to colour the board differently. I will explain why below. The diagrams below show an empty Zola board to the left and the Zola board with pieces ready to begin to the right. The board is available here.



Zola starting position

White moves first and then the move alternates, with the players taking turns to make a move. If you have a move you must move, otherwise your opponent moves until you do have a move.

We have already discussed distance as a mechanism for restraining the moves of pieces, used by Mark in his games over and over. Distance comes up in Byte and Monkey Queen, above, but also in Cage and Manhattan. In Zola, distance is measured in a straight line from the centre of the board, marked with a red dot in the diagrams above.

The colours on the board represent squares that are equidistant from the centre. Closest are red squares, followed by orange, yellow, green, blue, and lastly violet. I like to imagine the red dot in the centre is the summit of a mountain, and that the collection of squares with the same colour is a "contour line," much as you have contour lines on regular maps.

On a move you have two choices. You can choose to capture an enemy piece. To do this, your own pieces move and capture like Chess Queens, with the proviso that they must either move closer to the centre or at least stay the same distance from the centre. Captures, therefore, can take place by moving pieces closer to the summit or by keeping them on the same contour line.

The other choice is to move a piece without capturing. In this case, the piece must be moved just one square, like a Chess King, with the proviso that it must move strictly further from the centre.

And that is it, the first player to capture the last of the opponent's pieces wins.

The first obvious point to note about Zola strategy is that pieces further from the centre have the largest number of free capturing moves, and as they move inwards towards the summit their options decrease. It would seem best to capture, therefore, within the same contour line, as that preserves the distance from the centre and the number of options. There will be exceptions, however, and preserving maximum distance form the centre is not always best.

Every non-capturing move must be made with careful thought, because it puts you one step behind in the race to capture all enemy pieces. Sometimes, of course, you have no option, but sometimes it is best to make a non-capturing move even when you do have a capture. These moves and their timing, I think, are key to Zola strategy and tactics.

In this regard, the violet corner squares are the most valuable locations. Firstly, they are impervious to capture, aside from capture by other corner pieces. Secondly, eventually any piece moving without capturing must end up in a corner square. If you have a piece already in a corner square, whichever corner the moving enemy piece ends up in, it can be captured immediately—provided, of course, the path for capture is not blocked by another piece. Sometimes a corner piece may be forced out of a corner to a non-optimal location if the player has no other moves available except to capture with the corner piece. Remember, you can only pass if no other move is available.

For Zola strategy, I think the contour lines might be important. lt is also important to pay close attention to the shapes that develop around corners. There is much to discover with Zola.

According to Mark,

"I stumbled onto a lovely mechanism for assured annihilation with Zola. Luckily, the simple design engenders quality gameplay. It doesn't always. As you've seen, the endgame is a distinct phase where you can draw your opponent out of a corner and win."

With its unusual board, Zola is entered in the Unequal Board Spaces Game Design Competition. Zola is playable on Ludii and Ai Ai.

Conclusion

I have played a fair number of Mark Steere's large collection of games, and written about those that stood out for me. To reiterate, the collection of games I have written about here is not meant to be a list of the best Mark Steere games. My choice is subjective, and many games I simply have not played yet. Gyre, Rive, and Manhattan, for example, all look intriguing, though I have yet to try them.

My investigation of Redstone, here and in *AG21*, was a bit of a revelation. I do not think anyone previously had given Redstone much thought, even the designer himself. The few old comments I could find about Redstone typically referred to its slowness. Of course, it will seem slow if you need to capture every enemy stone on the board, but the emergent objective means that all you need to do is count the number of eyes to decide the winner. The investigation of Redstone uncovered hidden depths and interesting and beautiful features of the game. How many other Mark Steere games are like Redstone in this respect? At least those games I have highlighted in this article are worthy of consideration, and certainly there are others.

Mark Steere's design philosophy is stark, pure, and honest. He produces games and judges the results of his efforts on their architecture alone. He makes no pretence that he knows how to make good moves in any of his games. His goal is to create games with perfect architecture. If they are also fun, perhaps with interesting strategy and tactics that others can pick up and develop, then that is a bonus. I hope I have made a good argument that Mark Steere has a unique perspective on game design that we can understand and appreciate. ■

Mark Steere in his apartment in Ulaanbataar, working on a new game.

Acknowledgements

Mark Steere Games: http://www.marksteeregames.com/index.html
"The Oust Strategy Guide": https://shogiwar.webs.com/Hex_Oust/index.html

Ai Ai: http://mrraow.com/index.php/aiai-home/aiai/
BoardGameArena: https://boardgamearena.com
Boîte à Jeux: http://boiteajeux.net/index.php
Little Golem: https://www.littlegolem.net/jsp/main/
Ludii: https://ludii.games/
Mindsports: https://mindsports.nl/
SuperDuperGames: http://superdupergames.org/

UNEQUAL BOARD SPACES GAME DESIGN COMPETITION

By Kerry Handscomb

There were 13 entries all together for the Unequal Board Spaces Game Design Competition. We covered two of them in AG21*, Tip Top Toe and Hox. We would like to present all of the remaining games in this issue and the next. In this article, we cover Rosenkreuz, Chameleons, EVL, and Dag en Nacht. The descriptions of the games are by the authors themselves. Another entry, Zola, is described in the "Retrospective of Mark Steere Games" on page 10. Lastly, Jed is covered on page 24, along with Jade and some commentary on the origin of Jed. Jade was an entry to the Shared Pieces Game Design Competition of 2003. Jed is Jade modified by the movement protocol of Hox. The remaining games will be covered in* AG23*. I would like to say a very sincere "Thank you!" to everyone involved in the contest, game designers, judges, and advisors. Special thanks to Stephen Tavener for implementing all the games in Ai Ai, making it much easier to evaluate the games effectively. A big thank you also to Dave Dyer, who has already implemented Dag en Nacht on Boardspace.net. ~ Ed.*

Rosenkreuz

by Kanare Kato

Rosenkreuz (Rosy Cross in English) is an abstract strategy game for two players. It was designed based on Turkish checkers, also partially inspired by Oust by Mark Steere and Dameo by Christian Freeling.

Components

7×7 Checkered board with dark squares at the four corners.
28 game pieces: 7 dark-coloured pieces with "Rose" symbols and 7 light-coloured pieces with the same symbols; 7 dark-coloured pieces with "Cross" (or "Lily") symbols, and 7 light-coloured pieces with the same symbols.

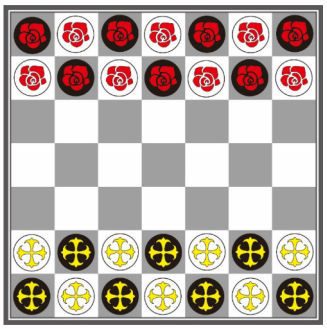
Setup

Place the pieces on the board as shown in the diagram. Decide which player will play with which symbol.

Definitions

In this game, "adjacent" refers to adjacent in the orthogonal direction. Therefore, diagonals are not included in adjacencies.

A "group" is pieces of the same colour that are adjacent to each other (any combination of symbols).



Rosenkreuz opening setup

Gameplay

The player with Rose symbol is the first to move, then players alternate turns moving a piece with their own symbol. All pieces move by "Step" or "Jump." Passing is not allowed.

Step: All pieces can move to an adjacent empty square in the eight directions. However, a piece may only move sideways, straight backwards, or diagonally backwards if its movement would allow it to capture an opponent's piece or pieces (by any type of capturing).

Jump: All pieces may jump over a friendly piece or an unbroken straight line of friendly pieces (any combination of colours) that the pieces are next to, in any of eight directions, landing on the empty square immediately after. No piece may ever jump over opponent's pieces. Also, multiple jumps are not allowed.

As with the step move, jump to the side, straight backward, or diagonally backward can only be made if the jump allows capture of an opponent's piece or pieces (by any type of capturing).

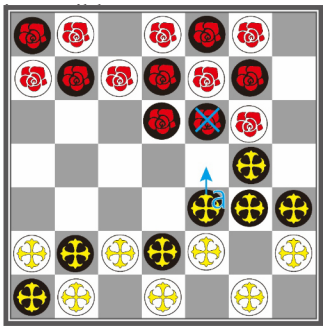
Minor capturing is an exception to the rule whereby a piece can step or jump only to an empty square (see below).

Capturing

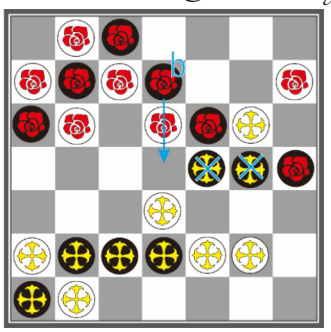
There are three types of capturing: "Major Capturing," "Minor Capturing," and "Attainment Capturing."

Major Capturing: If your move results in a group that contains two types of symbols and in which the number of your symbols is greater than the number of opponent's symbols, then all opponent's pieces directly adjacent to your pieces in that group are captured and removed from the game. This can be done by a step or jump move.

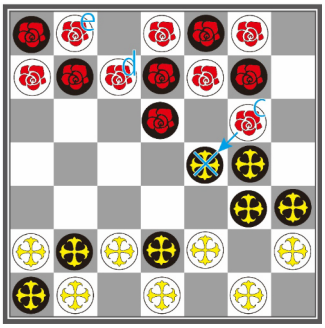
Minor Capturing: When an opponent's piece is on a square of the opposite colour, you can capture it by moving your own piece of the same colour as the square onto it and remove it from the game. This can be done either by step or jump. Thus, a piece can be moved to a non-empty square provided Minor Capturing



*Cross can create a group of size 7 with more Cross pieces (4) than Rose pieces(3) by advancing the piece indicated with **a** by Step. This captures the opponent's piece marked with an **X** that is in direct contact with an enemy piece in the group.*



*Another example. Rose can create a group of size 5 with more Rose pieces than Cross pieces by moving the piece **b** with an orthogonal jump. This will capture the opponent's pieces indicated by **X**.*



*Rose can capture the opponent's piece indicated with **X** on a square of opposite colour by advancing the piece indicated by **c** diagonally. Alternatively, Rose can also capture the same opponent's piece by moving **d** or **e** with a jump instead of moving **c**.*

Attainment Capturing: When one of your pieces arrives at the far row on the opponent's side, you can capture one opponent's piece (any colour) of your choice and remove it from the game. The piece of yours that reaches the end is repositioned to any empty square of the same colour that is closest to your side. So, if the four or five squares closest to your side are occupied by pieces, it is placed in one of the second-rank squares, and so on.

Suicide move

If your move causes the situation that a group contains two types of symbols and in which the number of your symbols is smaller than the number of opponent's symbols, then that move is considered a suicide move, and all your pieces adjacent to the opponent's in the group are captured by Major Capturing and removed from the game.

It is possible that after your piece captures an opponent's piece by Minor Capturing, then it is captured at the same time by major capturing as a suicide move. (Of course, a Minor Capture may creates a group permitting a further Major Capture, rather than suicide.)

If a piece is captured by a suicide move on the far row, the piece cannot perform an Attainment Capture.

Game end

The player who removes all enemy pieces of either dark or light colour wins the game immediately.

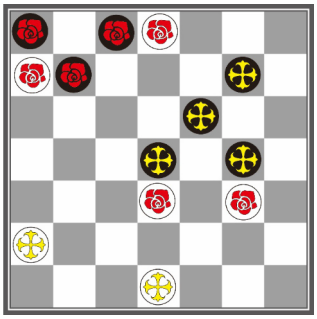
If a player cannot move during a turn, the player loses the game.

Strategy

Major Capturing can capture several opponent's pieces at once, however, it may not be a good idea to collect together too many of your pieces of the same colour for this purpose—a collection of pieces of the same colour makes you very vulnerable to your opponent's Minor Capturing. In the first half of the game, aiming for a combination of Major and Minor Capturing will be the key to the game.

Of the three types of capturing, Attainment Capturing is the most powerful—it not only reduces the number of enemy pieces, but also has the potential to break up an opponent's formation and create your own formation.

In the endgame, the game will be decided by whether you have a formation from which is easy to achieve Attainment Capturing. A "spear" formation like the one held by the Cross player in the diagram below is immensely powerful. Cross can perform a series of Attainment Captures and pull off the victory at once.



Example of the "spear" formation

Chameleons

by Chris Huntoon

The board and opening setup are shown below.

Chameleons setup

The object to the game is to completely eliminate your opponent's Chameleons, either through capture or colour change.

Chameleons can move in all eight directions. There are two types of movement: a step and a jump.

Step: Move to an adjacent empty space.

Jump: A piece can jump over an opponent's piece and remove it from the game, if that opposing piece is adjacent and the space beyond it is empty, as in Checkers. And just like Checkers, jumps are mandatory and multiple jumps are possible. If given a choice of possible jumps, a player need not pick the one with the most captures.

Colour change: If a player ends her turn with one of her Chameleons on a space of the opposing colour, she has until the beginning of her next turn to move it to a space of her own colour. If she does not, that piece changes colour to match its space and effectively switches sides. (When I was first play-testing this I used Othello pieces.) If a player moves that Chameleon from a space of the opposing colour to another space of the opposing colour, then it changes colour when landing on that space. If a player starts a turn with a Chameleon on a space of an opposing colour, but then uses another Chameleon to perform a series of jumps, the Chameleon on the opposing colour will flip after the first jump, as the player has signalled that he will not be moving it.

The central, spiralled space is always considered the opposite colour of the Chameleon that occupies it. Thus if a Chameleon is left on that space, after the original player has had a turn to move it, it will begin changing colours every turn. It will then match the colour of the player whose turn it is.

EVL

by Kevin Kane

EVL is a territory capture game played on an unusual board of heptagons (7-sided) and pentagons (5-sided), using a stacking and unstacking mechanism. EVL forces are trying to invade you; deploy your forces and defend your territory!

Objective

The first player to capture 10 pentagons wins the game.

Components

Board, 24 markers (12 of each colour, tall skinny pieces), 56 pieces (28 of each colour, flat stackable cones)

Game Play

The board begins empty. Each player chooses a colour. Black goes first. Underlined terms will be defined later in the rules.

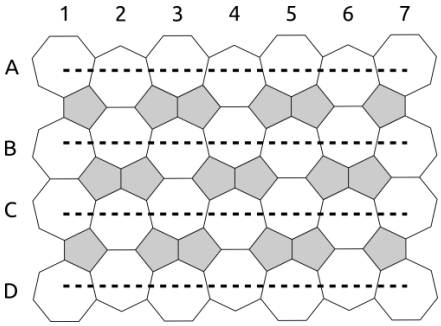
On a player's turn, a player must either (1) place one piece from your hand onto the board, either on any empty space or on an occupied space containing a piece or stack that you control, or (2) unstack a stack of pieces that you control.

Note: Legal stacks are a maximum of four pieces high; the colour on the top of a stack controls the stack.

Pentagons can only be captured by the active player on an unstack, not by placing.

The Board

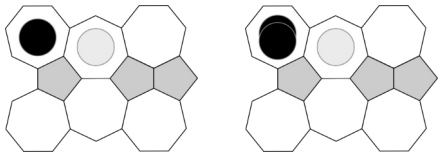
The board is made up of four rows of heptagons surrounding 18 pentagons.



Stacks

A stack consists of two, three, or four pieces, stacked on top of one another. Stacks are created by placing one piece on top of one or more pieces that are already on the board. You cannot create a stack taller than four pieces in height. The player who occupies the top of the stack controls the stack.

Example: Black has placed a piece, and White has placed a piece next to it. On Black's turn, Black places a second piece on top of the existing piece, creating a stack. Placing on top of White's piece would be illegal.



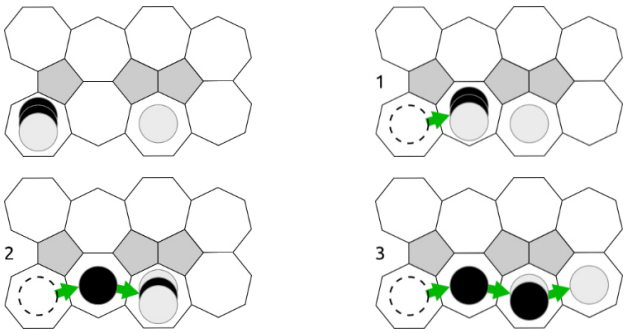
Unstacking

To unstack, pick up the entire stack (a single piece is not a stack). You may move the stack up to the number of spaces equal to its height. With the exception of the space the stack occupied at the start of the turn, whenever a stack exits a space, it leaves behind exactly one piece from the bottom of the stack.

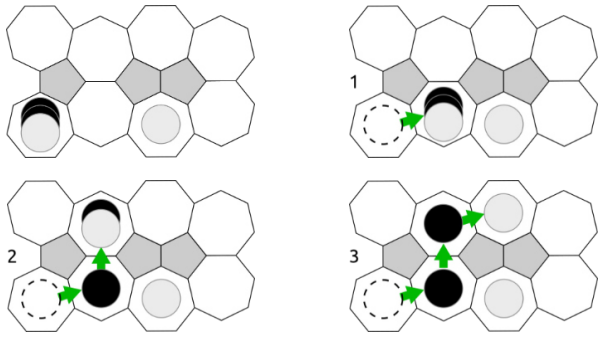
The stack height limit can be temporarily violated during an unstacking, but at the end of the turn no stack may be taller than four. In effect, this makes a stack of four an impassable wall, since there is no way to unstack over it without increasing its height.

Unstacking occurs via connected heptagons. You cannot jump over pentagons while unstacking.

In the diagrams below White unstacks the white stack, one piece at a time from the bottom, up to three spaces (the height of the stack). Note, any of the three resulting positions would be legal (unstacking one space is essentially the same as moving the stack one space).



Unstacking does not need to be straight along a row (but you may not reverse direction and double back on the same path). The sequence below also shows a legal unstacking path. Any of the three resulting positions is valid.



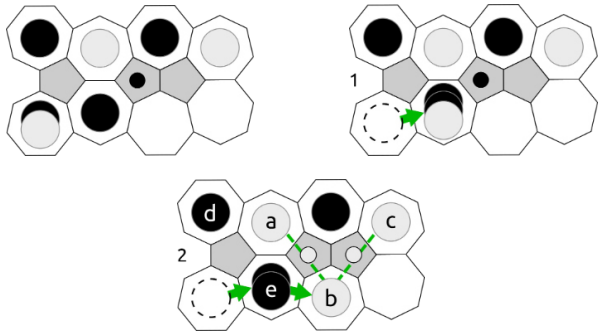
Capturing pentagons

The goal of EVL is to capture the most pentagons. Pentagons are captured by "surrounding" them with your pieces on any two non-adjacent heptagons.

You can only capture pentagons with an unstack, not by placing a piece.

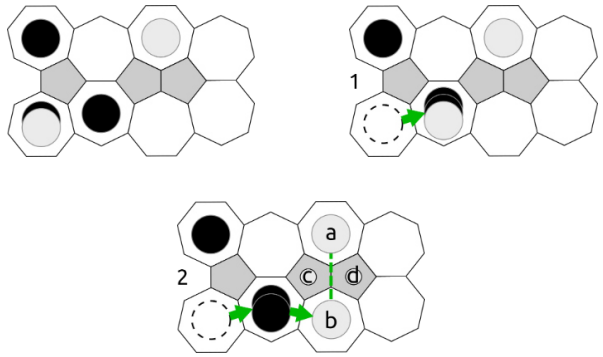
In the diagrams below, White unstacks the White stack to the right. At the end of the unstack move, White surrounds the pentagon that falls between **a** and **b**, and between **b** and **c**, because each pentagon is now surrounded by a White piece on two non-adjacent sides. White places a marker on each pentagon (replacing the existing Black marker).

Note that even though the unstack resulted in Black surrounding the pentagon between **d** and **e**, no capture for Black takes place. You can only capture pentagons for yourself.



You do not lose a pentagon if you move a piece away and no longer surround it. Your marker stays until your opponent takes it from you. However, you cannot hold a pentagon just because you still have pieces surrounding it. An opponent can take it if they surround it with an unstack on the opponent's turn.

Let us examine a similar, but slightly different situation. In this case, when White unstacks to the right, White is still able to capture two pentagons. That is because the pentagons marked **c** and **d** are both surrounded on two non-adjacent sides by **a** White piece (**a** and **b**) at the end of an unstack.



Winning the game

The first player to capture (and keep) 10 pentagons wins the game! You can play to more or less than 10 for game-length variety.

Notation

Placing a piece: +B6
Unstacking down the same row: B1-B4
Unstacking across rows: B2-B4,A4-A5

Credits

Designer: Kevin R. Kane
Artwork: Kevin R. Kane
Special thanks to J.C. Tsistinas, Dave Dyer, Chris Adzima and Jennifer S. for their great suggestions and playtesting assistance, and to Roman Ondrus for creating the online sandbox version: https://screentop.gg/@Noeh/evl-game.

Legal

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Dag en Nacht

by Chris Huntoon

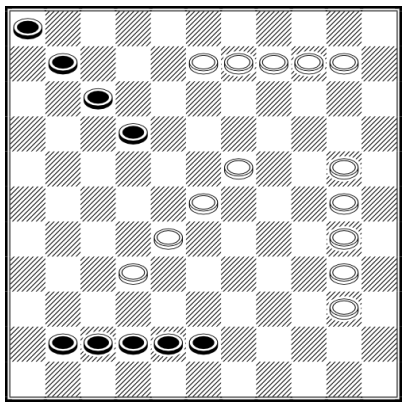
["Dag en Nacht" is Dutch for "Day and Night."]

The board is an nxn squared board, where n is an odd number between 11 and 19. A 15x15 board is considered average. The board is laid out in a checkered pattern of black and white spaces. The white spaces are the most numerous, with the four corners all being white. The board starts off empty.

The players are Black and White, with Black going first. Each has a supply of stones in her colour that fit the board spaces.

On a turn, a player takes one of the following two actions: (1) Drop a stone of her colour onto a black space—a stone may never be entered to a white space; (2) Shift a stone of her colour already on the board a single space orthogonally—in other words, move a stone from a black space into a neighbouring white space.

The winner is the first player to get five of her stones in a row horizontally or vertically, or four stones in row diagonally on white spaces. Stones on black spaces cannot win with a diagonal line.



Dag en Nacht winning lines. With the optional balancing rule, Black is prohibited from forming a B-W-B-W-B line.

Optional rule

Players may decide to help mitigate Black's first move advantage by adopting a rule prohibiting Black from winning with the easier B-W-B-W-B orthogonal line and only allowing Black to win with the harder W-B-W-B-W orthogonal line. White has no similar restriction, and can win with a B-W-B-W-B line.

Background

Growing up, my brother used to have a copy of M. C. Escher's black and white print Dag en Nacht up in our basement. Thinking back on it—with its transition between black and white—led me to think of this game.

I started off just having some vague concept about moving pieces between black and white spaces. I got out the old checkerboard and started playing around with the idea to see if I could make something of it.

It was then I realized that all the n-in-a-row games I have seen were on a plain grid. If you moved them to a checkered grid, then orthogonal lines had to be a combination of light and dark spaces, and diagonal lines had to be all spaces of one colour. That was the breakthrough I needed.

I have named this game in honour of that Escher print that was the inspiration for the game. ■

This issue was almost complete when the results came in for the Unequal Board Spaces Game Design Competition. I rewrote the editorial and added the few notes below, and these were the only changes we made. As you know from my Editorial comments, the winner is Dag en Nacht. Chris Huntoon's game is a very worthy winner, in my opinion—remember, I did not vote! When I first saw Dag en Nacht, my reaction was, "Wow! Can this really work?" Dag en Nacht is original conception, an addition to the small genre of alignment games perhaps as significant as Connect 6.

My only concern was that it was balanced. For example, when placing a stone on a black square, your number of stones on the board increases and you have additional flexibility about which white spaces to occupy. You have to take white spaces eventually in order to construct a winning line, but, you don't increase your stones on the board when you take a white space. Is it possible that the optimal strategy for both players is to take up all the black spaces on the board first, waiting for the opponent to move to a white square before responding in kind to defend? If so, Dag en Nacht is not very interesting. I don't think this is the case, and it might be obvious that the black-square strategy is faulty.

A second aspect of balance is whether Black and White have reasonably equal opportunities to win. The designer's mechanism to balance the chances for Black and White seems to be very simple and workable. I wonder if it is really needed, and if so whether it actually results in a balanced game? Recall, for example, Go Moku, and the difficulties of achieving equal chances for Black and White. On the other hand, is it possible that Dag en Nacht is too balanced, and good play by strong players will always result in a draw? These questions are for the future. As we have played the game so far, it seems balanced.

Concerning a third aspect of balance, Dag en Nacht has a brilliant and elegant solution: the centre square, usually the most advantageous location in this type of game, cannot be reached immediately, because it is white. A player must first place a stone on a black square adjacent to the central white square, and only next turn move in to occupy the central white square. Black can do this at the outset of the game. However, it will allow White to take the lead in number of stones on the board, with greater flexibility over which white squares to take next. I do not know for certain whether or not the strategy to occupy the central white square at all costs is best for Black. If the central-square strategy is not good for Black, it means a balancing mechanism is built into the the architecture of the game, which would be a beautiful way of equalizing the opportunities for Black and White, while maintaining distinct strategies for the two. It means the pie rule is not needed.

Either way, Dag en Nacht is an original invention and an important new alignment game. I hope that we can run future articles exploring this game further. Dag en Nacht is now playable on on Boardspace.net. under the name "Day and Night." ~ Ed.

Quintet

Quintet is a game by Hubert Phillips, described in his book The Pan Book of Card Games *(1960). Quintet works well for remote play, because it is a game that can be played via video connection, where each player controls a separate deck of cards. Quintet is an interesting game in its own right, with very simple rules provided you already know Poker combinations.*

Each player has a Piquet deck, which is the 32-card deck created when 2's through 6's are removed from a regular Poker deck. One player shuffles his deck and randomly removes seven cards. The other player removes the same seven cards from her deck. Players spend a little time sorting their 25 remaining cards into five Poker hands, which they keep secret, and arrange in order. The players expose their five hands, one by one. For each "trick" the winner is the strongest Poker hand. The key rule is that the tricks score differently: the first trick scores 3 points, the second 4, the third 5, the fourth 6, and the fifth 7. Drawn hands split the points.

Note that a game can be won by winning the last two tricks alone. Do you play the strongest possible hands last? If your opponent knows you plan to do this, you may be outwitted. Quintet has plenty of opportunity for bluff; it's genuinely Poker for two. ~ KH

Acknowledgements for Heuristics from page 26

My thanks to Myron Samsin, Christian Freeling, Carlos Luna Mota for very useful comments!

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The header image shows a game of Tak in progress, with the Tak University Edition (2018).

Jed

A Revisioning of Hex, with Shared Pieces, Different Objectives, and Unequal Board Spaces

by J. Mark Thompson and Kerry Handscomb

*A game resurrected from the Shared Pieces Game Design Competition from 2003 is Mark Thompson's Jade. Like Unlur (*AG12*), Jade was a revisioning of Hex. In Unlur, the two players each have their own kind of piece, although their objectives are different. Jade goes a step further by having the pieces belong to both players equally, although again the game works because the two players have distinct objectives. Jade is playable on Richard's Server. The Richard's Server rules for Jade contains some history, showing that investigation of Jade dates back at least to 2001.*

Around the time Jade would have gone into the old AG17*, there was some discussion in the community about the phenomenon of "chilling" in Jade. Situations would arise where the action in the game would become focused completely on one pair of spaces, in the sense that the remaining spaces could be filled in with black and white stones in any distribution without affecting the outcome of the game; on the other hand, movement to either of the key spaces would result in immediate loss by the opponent taking the other key space.*

I do not know how frequently chilling occurred, but it was thought to be a flaw in Jade. Mark Thompson, author of Jade, spotted Hox in AG21*, and suggested that the Hox protocol might be a solution to chilling in Jade. We investigated, and we think it is a solution, almost completely, in the sense that chilling can still occur, but only as an extreme outlier. The new game is called "Jed," which means "jade" in Malay. The three-letter name conveniently supports application of the Hox protocol! It is interesting to note that Jed would qualify for three of the four game design competitions we have run: shared pieces, unequal objectives, and now unequal board spaces.*

Below, we have reproduced first the original article on Jade by Mark Thompson, as it would have gone in the old AG17*. Following the Jade article is an Addendum on chilling, the apparent "flaw" of Jade. Then, we give Mark's rules of the new game Jed. A further Addendum follows based on email conversations this spring. ~ Ed.*

Jade

There are two players, named Cross and Parallel. In the standard game Cross moves first and Parallel moves second. The board is a hexagonal grid in the shape of a parallelogram; the size currently considered best is 9x11, but other sizes and shapes could be used.

A move for either player consists of placing either a Black or White stone onto the board. Either player may use either colour on any turn.

The two players have different objects. The object for Cross is to form a connected group of like-coloured stones (connected group defined as usual in hexagonal-grid connection games such as Hex or Havannah) that touches all four edges of the board. As in Hex, corner cells count as belonging to both the edges that meet there.

The object for Parallel is to form two connected groups, one of Black stones and one of White, such that both groups touch the same pair of parallel sides.

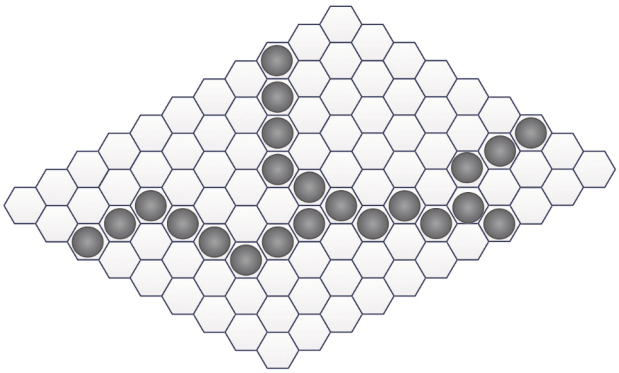


Figure 1: A win for Cross. Cross's winning group can be either Black or White.

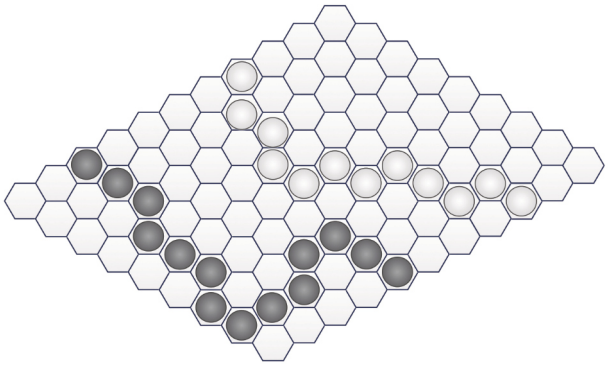


Figure 2: A win for Parallel. Parallel's lines can connect either pair of opposite sides.

Passing is not allowed. The player whose objective is completed wins the game, even if the other player placed the final stone.

There are restrictions on opening moves on certain board sizes, which prevent a player from using a "symmetry strategy" for a trivial win: (1) If the board is the same odd number of rows and columns, and if Cross plays first, then Cross may not make his first move on the board's short diagonal; (2) If the board has one even side and Cross plays first, then Parallel's first move is

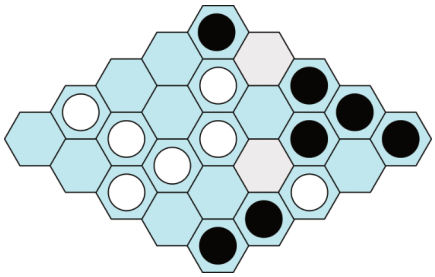
not allowed to be in the cell directly opposite Cross's first move (rotated 180 degrees about the centre of the board).

Note that if the board has an odd number of rows and a different odd number of columns, such as the standard 9x11 board, these rules will not come into play.

Draws are impossible. For if the board were completely filled with Black and White stones, and if the pairs of opposite edges were coloured one pair Black and the other pair White (like a Hex board's edges), then it would form a completed Hex board, and by the familiar proof either Black or White would have won the Hex game. But if the edges were then recoloured White and Black in the opposite sense, it would still form a completed Hex game on which either Black or White would have won. By the win-conditions of Hex and of Jade as described here, if both of these notional Hex games had been won by the same player, then Cross will have won the Jade game; on the other hand, if the two notional Hex games had been won by different players, then Parallel will have won the Jade game. Therefore any filled Jade board must have a winning group for either Cross or Parallel.

Addendum 1

Jade was played for a few years in the early 2000's. There was discussion around the phenomenon of "chilling" in Jade, as described above. The game remains ultimately decisive, in that eventually the rest of the board would have to fill up and force the fatal move, which means that the player who moved first will win on an 11x9 board. Here is a concrete example of chilling:



Chilling in Jade

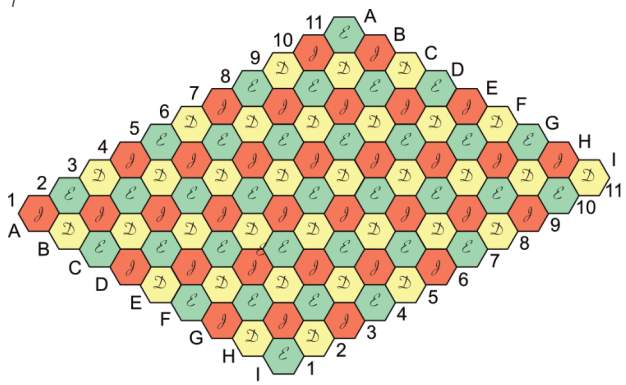
- *If Cross moves to either grey square, Parallel will place a piece of the other colour in the other grey square to win.*
- *If Parallel moves to either grey square, Parallel will place a piece of the same colour in the other grey square to win.*

The remaining empty blue spaces can be filled with any permutation of black and white pieces, with neither player winning. ~ Ed.

Jed

Jed is basically Jade with the "hox protocol" for placing stones, as described in the game Hox, by Larry Back, *AG21*. The board spaces are identified with the letters H, O, and X. Moves must be made in the order ...H-O-X-H-O..., and so on, in a regular cycle. Hox is Hex with the hox protocol; Jed is Jade with the hox protocol, or perhaps we should call it the "jed protocol." Jed is the Malay word for Jade, which conveniently has only three letters! Here is an 9x11 Jed board:

"'Here, draw the table nearer, and let us have the cards again,' said Sir Mulberry. 'More piquet. Come.'" ~ Charles Dickens, *The Life and Adventures of Nicholas Nickleby*



Jed board

As with Jade, you need a sufficient quantity of black and white stones. The players take turns to place stones on vacant spaces on the board. Either player can play either colour at any time, as with Jade. The first player begins by placing a stone on any vacant space. Thereafter, stone placement must follow a strict order, ...J-E-D-J-E..., and so, or equivalently, ...Red-Green-Yellow-Red-Green..., and so on. Thus, if a player places a piece on a J(Red)-space, his opponent must immediately follow with a move to an E(Green)-space. Likewise, E(Green) is followed by D(Yellow), and D(Yellow) is followed by J(Red). The players can choose to follow the letters or colours, whichever is easiest to remember, "JED" or the traffic-light order of Red, Green, and Yellow.

One player is Cross, the other is Parallel. The objectives of Jed are identical with that of Jade above, for which the colours and letters are irrelevant. Cross must connect all four sides of the board with a cross of like-coloured stones; Parallel must connect two parallel sides with two lines of opposite colour. Cross may connect the pair of sides the shorter distance apart, or the other pair of sides the longer distance apart. Examples of the objectives of Cross and Parallel are shown above in the rules of Jade, above.

A modified pie rule operates in Jed. The first player moves and declares as either as Cross or as Parallel, and the second player can choose either to reply with a move and play the other role, or adopt the move and the role and return play to the first player.

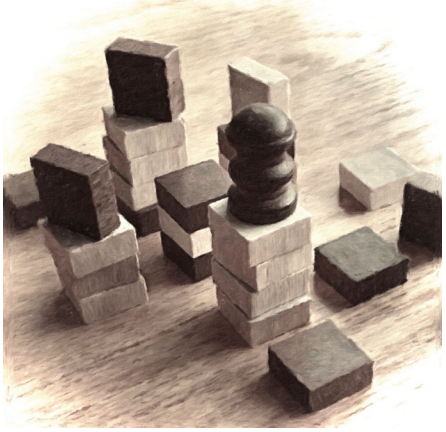
Those are the full rules of Jed. Other sizes of board of course are possible. It is convenient to have one of the sides divisible by three, so that the board fills with an equal number of J-, E-, and D-spaces. Other sizes are playable, with total number of spaces not divisible by three, but you must be careful which type of space is occupied first in order that it is possible to fill to whole board by the end of the game.

Addendum 2

The interesting question now is how the hox protocol salvages Jade from the chilling flaw. Suppose the two cells of a chilling pair, as described in the example above, were different types, say, J and E. The player with the next E move would be able to play the E of the chilling pair, knowing her opponent must respond by playing in a D somewhere, after which she can take the J of the chilling pair.

This form of chilling situation is shown in the diagram below left. (J-E-D rotation, or alternatively Red-Green-Yellow rotation). In regular Jade, X and Y would be a chilling pair: a player could take either space and then immediately lose as her opponent takes the other chilling space. In Jed, however, Player A could take X, Player B must take a green space somewhere, and then Player A can take Y to win.

(Continued on page 34)



Abstract Game Heuristics

by David Ploog

The rules of a game say how to make a move but nothing about making a good move. This property is cherished by adherents of the genre and advertised as "a minute to learn, a lifetime to master." Yet whenever it is your turn: how to find that good move?

The most basic option is to calculate: if Black plays here, White can play there, and Black again can do this.... That is what everyone is forced to do when facing a new game without experience to rely on. The process of taking turns in one's mind is slow and exhausting. For a machine, it is called "brute force" and is computationally expensive. Anyhow, it is this activity which to an extent defines games like Chess and Go. David Parlett calls this specific intellectual exercise "forward visualization" and it goes well with spatial recognition skills. Another common descriptor is "look-ahead" and Go players say that they are "reading lines" in a position.

Clearly, a better player can calculate more lines, with more precision and higher speed. But this accounts only for a fraction of the skill! In fact, Chess masters do not calculate extremely many lines, a huge distinction from machine play. Instead, they are much more selective about which lines to look at, and those lines they will compute far deeper than an amateur.

As players of any game know, it is almost always impossible to see all the way to the end, there are too many choices! When we cannot play perfectly, we have to settle for less: intuition, experience, approximations. This is how heuristics come into play, the methods players resort to other than brute-force computations—they are shortcuts in the planning stage.

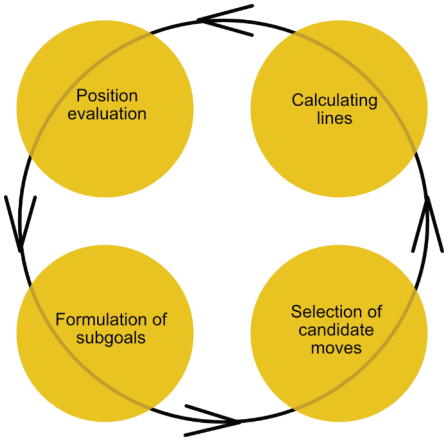
Board game heuristics are often identified with rules of thumb. While not wrong, I am going to argue that a more specific description is possible and desirable.

The most basic property of heuristics is that they can be applied to positions new to a player. That is the reason for their existence: human players need heuristics to deal with the overly complex game space. In the Chess literature this is called generalization (D'Ereditá & Mario Ferro) and explicitly stated by Frank Lantz et al:

"In a sense the heuristic operates as a kind of compression function on the game tree—a map that reveals structural features in the underlying tree. A blurry, tattered map, but a map nonetheless."

One reason why board games are fun is that we can transcend the initial stage of mere calculation. Taking our use of heuristics into account, we turn again to the question about how to find decent moves. A coarse flowchart for the generic thought process of "making a move" is at the top of the next column.

Why is this crude? Firstly, at any stage, the thought process can revert. For example, calculation might show that a particular subgoal is out of reach in the current position, forcing the player



Generic thought process for finding a good move

to backtrack all the way to re-evaluating the position. Secondly, subsequent position evaluations will take previous ones into account, even several turns ago. For example, in tactically hot positions, the first two steps are not needed because evaluation and subgoals are preserved from previous turns. Thirdly, the process will iterate and fork, for example, by following various lines or by pursuing several subgoals.

I will sort heuristics into the following four flavours:

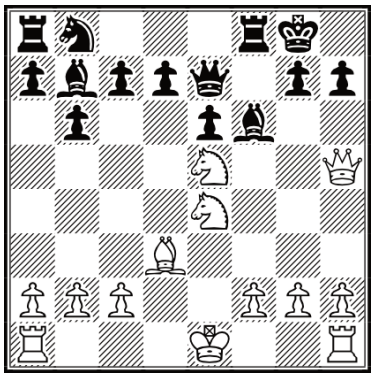
- *Evaluations*: Assessing a position, locally and globally.
- *Strategies*: Global methods and formulation of subgoals.
- *Tactics*: Local methods, generally small scale and short term.
- *Patterns*: Specially denoted moves or structures on the board.

Tactical heuristics are about candidate moves as well as calculation. Patterns occur across the whole spectrum, and this is not surprising: when playing board games, shapes are crucial at every stage. I think it makes sense to say that patterns are the building blocks of (higher) heuristics.

In *Characteristics of Games*, the authors distinguish between "state heuristics" (reading the game state, called evaluations above) and "directional heuristics" (indicating the next action, split up into tactics and strategies above). Again, patterns belong to both kinds.

First examples from Chess

Let us start with one of the most studied games, brimming with established knowledge. Every beginner picks up quickly that the Queen is the strongest force in the entire army, so it ought to be protected. But there are many marvellous winning combinations enabled by Queen sacrifices, like the one shown here.



Edward Lasker vs. George Alan Thomas (1912): Qxh7.

These combinations are exciting and beautiful because they run counter to the basic heuristic. On the other hand, such a move is not surprising to a purely calculating human or device.

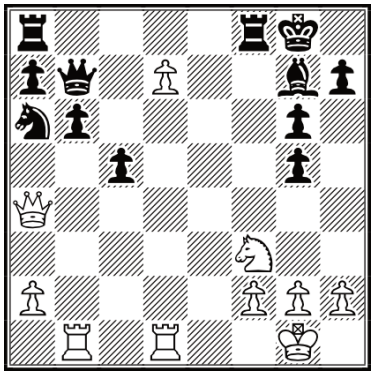
Protecting the Queen is part of a larger guideline learned early: point values assigned to pieces, usually Pawn = 1, Knight = 3, Bishop = 3, Rook = 5, Queen = 9. This provides decision guidance when contemplating the trade of a Rook for two Bishops, for example. The scheme is imperfect but easy to use.

Here we get a glimpse at how heuristics work: novices memorize the numbers; soon enough, players have the material values internalized; at some point, they learn about nuances, such as Knights being more valuable than Bishops in closed positions but worse in the late game; finally, as with all heuristics, players become aware when to ignore them—such as sacrificing material for a combination, position, or tempo.

Concerning the heuristic types, piece values belong to strategy and to evaluation. This is because position assessment comprises material comparison at its core, later refined by concepts like piece development. It is strategic because aiming for an endgame with a material advantage can easily translate to a win, so it a reasonable subgoal.

Many patterns are tactical heuristics: the position below shows linked Rooks (generally good) and an edge Knight (bad). Other standard patterns are forks and pins (both good).

Pawns are very important, and their asymmetric behaviour triggers interesting gameplay. Many heuristics relate to Pawn patterns; stable Pawn structures have strategic significance. The position shows chained Pawns (good), a free and advanced Pawn (very good), an isolated Pawn (bad), doubled Pawns (bad). A free Pawn (meaning that its further forward movement is not impeded by opposing Pawns) can form a valuable subgoal, possibly accruing strategic significance—in this game, White sacrificed material to gain a free Pawn and won with it.



Garry Kasparov vs. Josef Pribyl (1980)

What exactly is a game heuristic?

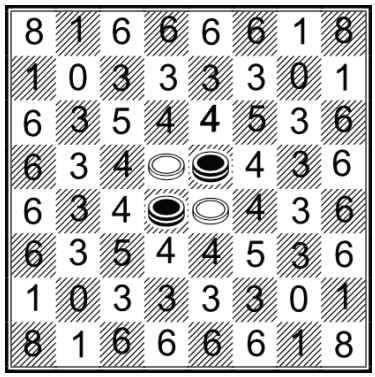
Heuristics occur in all areas of human endeavour and in this generality are completely outside the scope of the article. Let me stress that the following definition is only about heuristics for playing of board games. It is still vague—necessarily so because the concept is very broad—but yet more specific than mere rules of thumb. A working definition is as follows: A heuristic attaches a label to a collection of [sequences of] [partial] positions; heuristics often, but not always, include an assessment (good/bad).

The label is the players' handle for thinking and talking about the heuristic. Specialized jargon is common although different communities may have divergent terminology. It is reasonable to include negative heuristics, in other words, attach names to patterns, tactics and strategies which are generally inferior. Not only does this allow us to avoid them on purpose, it also makes it possible to discuss when such a heuristic does work. In fact, Nick Bentley argues that the availability of heuristics which seem good but are not—i.e., which ought to be superseded by better ones—is a hallmark of a good game; he calls this property "speciousness." I want to underline the importance of having a name by quoting John Fairbairn:

"Difficult concepts or positions are usually difficult for most of us to understand without a handy label. Imagine where we would be without the label 'good shape.' Would we then be aware that such a thing even existed?"

In the simplest case, a heuristic associates a true/false value or a number to each legal full-board position. Is a Symple position already cold? The material values for each side in Chess. The number of clumps in Lines of Action—a bad approach, by the way. Recall that heuristics can go awry; in fact, the way to better heuristics is paved with worse ones.

Many evaluation heuristics are global (about full board positions) and static (a single position, not a sequence of moves). Reversi has a primitive global heuristic assigning values to each square, with corners getting the best ratings. As with piece values in Chess, the numbers are not hard and fast; beginners learn first that corner squares are extremely valuable.



Relative values of board spaces in Reversi

A little more situational: The minimal number of placements needed to finish a Havannah frame. These can only be counted once a ring, fork, or bridge frame has been established, so they are not available for all positions. Of course, before that, players can (and will) count the numbers of moves needed to turn partial frames into proper ones.

Many heuristics are local, in that they refer to a part of the board, sometimes very local; this is what is meant by "partial position" above. Common are patterns, that is piece

configurations of importance. Various Chess patterns have been mentioned before. Needless to say, Go—as the primordial placement game—has a myriad of patterns, including the empty triangle (a bad shape), bamboo joints, snapback, and many more. Other examples are the chariot of Murus Gallicus, the bridge of Hex, the open three and four of Connect6. Standard Backgammon heuristics are: pip count (global, evaluation), points (pattern, tactical), prime (pattern, strategic); all of these are static.

More advanced heuristics are dynamic, thus containing (usually varying) follow-up moves. Such heuristics refer to a collection of move sequences. Typical instances are opening formulas, like the Sicilian Defence in Chess or the many *joseki* of Go. In the tactical realm, many sequences are grouped under a particular label, such as ladders (standing for a particular position whose development is implied).

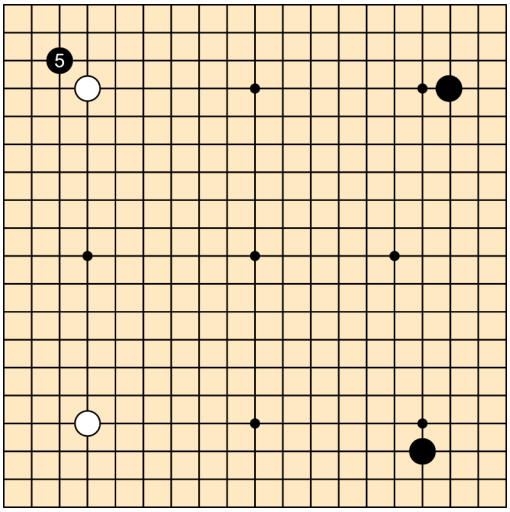
The distinction whether a heuristic is static or dynamic can be blurry. For example, Hex players are familiar with templates, configurations ensuring a partial connection (often towards an edge). The template itself is static, but the execution against an opponent's intrusion inside it is dynamic. Likewise, while the assessment of the status of a Go group (as alive, dead, depending on *ko* or tempo) is a snapshot, whereas the process of killing or making life is dynamic.

Proverbs are the other classic method to store knowledge, besides game-specific terminology. The classics have plenty of them. Here are two examples from Go: “There is death in *hane*” (tactics); “A *ponnuki* is worth 40 points” (evaluation). Most Chess players will have heard early on that "A Knight on the rim is grim." Japanese Shogi also has lots of interesting proverbs, including “Early escape by the King is worth eight moves.” I believe it is a sign of maturity and greatness when players start inventing such phrases for their game.

The life cycle of heuristics

Heuristics are not intrinsic properties of the game as a system of rules. Instead they are developed and preserved by the playing community. It is fun but far outside the scope of this text to speculate whether programs based on neural networks build their own heuristics or do something else. Older game-playing programs implemented human heuristics, especially drawing on expert knowledge in their evaluation functions.

A heuristic is proved wrong when a new, better heuristic establishes its superiority. The classical games have histories long enough for us to be aware of many heuristics that have fallen by the wayside.



Early 3-3 point invasion in Go

A current example from Go is the 3-3 invasion. It has always been clear that a single stone on the star point does not secure the corner territory. By invading, the opponent gains a small corner territory at the expense of thickness. The question becomes at which stage of a game the 3-3 invasion is appropriate. Accepted wisdom, laid out in books, was to delay the 3-3 invasion to the midgame. Generally, it was thought, the outside influence is too valuable early on. Imagine the shock when computer Go started playing the invasion at turn 5—with success! This was an extreme departure from a well-established heuristic. By now, turn 5 corner invasions are common in professional games, too. Following AI lead, the *joseki* (corner formulas) have been changed so as to reduce the outside influence considerably.

As with the 3-3 invasion, heuristics usually are not flat out wrong but have to be refined, for example by applying them more conditionally. As knowledge about the game accumulates, it is standard routine to adapt existing heuristics.

This process has similarities with biological evolution: It does happen that a heuristic has to be entirely discarded (for example refuted openings in Chess or Go). It also happens that genuinely new ideas are played successfully, and become the seeds of a novel heuristic. Most often, heuristics mutate. Thus heuristics compete with each other, and a new heuristic may remove or redress or restrict a previously dominating one.

The history of Chess exemplifies this: the Romantic school, stressing offence and combinations and represented by Adolf Anderssen or Paul Morphy, was superseded by the positional and defensive approach of the Modern (or Scientific or Classic) school, started by Wilhelm Steinitz. A later paradigm shift came with the Hypermodern school, which rejected the importance of occupying the centre.

One would hope that in this way all heuristics together converge to perfect play. This is an idle hope! One reason is that heuristics can be ever more fine-tuned: cutting away false positives and spinning off sub-heuristics for special cases. By doing so, the heuristics get better and better, but they also become more and more complicated. Which makes them harder to invent, to apply, to store, and to spread, ultimately defeating the point of heuristics. Thus, the most refined heuristics are relevant only to the most dedicated players.

There may be potential in assessing heuristics through programs playing at superhuman level; an option now in principle available for every game. For a long time, AI play felt alien and far removed from heuristics. Thankfully, the latest, neural network-driven generation of programs has changed that: computer moves look much more natural now and are closer to our heuristics. For Chess, this is nicely explained by the authors in their book *Game Changer*.

That said, it still takes effort by human players to translate computer moves into heuristics. And even if computer play feels more familiar, there are certainly surprises like the early 3-3 invasions mentioned above.

The statistical point of view of heuristics

When studying a particular abstract board game, there are two different views one can take. On the one hand, the game is a huge combinatorial exercise, and assuming a finite game tree (for example, if repeated positions are impossible or forbidden), each position (i.e., node in the game space) has a win/draw/loss value under perfect play, including the starting position.

On the other hand, all interesting games are too large for the combinatorial approach to work. Therefore players approach a game statistically: being unable to precisely calculate the win/draw/loss state of a given position, we are constrained to estimates. Now, some positions are more likely to yield a win than others. It is possible to quantify this statement, at least in

principle: count the number of winning moves and the lengths of the corresponding fastest winning lines. For instance, contrast a position in which five out of twenty moves win and each does so in at most six turns with another, where the player has to make the uniquely correct move for ten turns.

A player aims to make moves gravitating towards clearer "win" values. One job of heuristics is to suggest such moves. In other words, heuristics are designed as attractors in the game space towards regions with many (and clearly) won positions, and as repulsors away from lost positions. In the words of Lantz et al., and emphasizing their use of "statistically":

"Heuristics take advantage of regularities in the game tree to guide the player towards areas of state space where winning paths are statistically more dense."

This approach also makes it clear why negative heuristics (such as bad shapes) are so useful. When calculating lines in a particular position, negative heuristics function as warning signs, telling us to search for good moves somewhere else.

Heuristics for new games?

You can argue that invoking shelves full of Chess and Go literature is pointless: sure, these books contain loads of heuristics for these two games, but how would that help with a new design? That is a valid argument, and it is entirely true that many new games are born naked—without heuristics to rely on.

We can import heuristics for offspring of a familiar design, such as Chess or Draughts variants. There are some meta-heuristics that apply very broadly, for example to placement games with the connection goal. One of the them is the broadside, originating in Hex but applicable to many connection games: it refers to building a structure perpendicular to the intended direction of the connection; contrary to what one might believe at first, broadsides are regularly sources of strategic flexibility.

Another meta-heuristic for games with capturing mechanisms: if in doubt, capture! In fact, this is so deeply rooted in human behaviour that players have to learn to resist it. In Chess, a fair trade in material can still be bad for positional reasons. Worse, a gain in material might be a tainted gift, a sacrifice that triggers a loss. In Go, players have to distinguish between unimportant stones or groups (whose capture is an endgame matter) and crucial stones, usually cuts.

Players feel lost without instincts. This can be seen as a bad thing—on the other hand, a zero baseline makes it easier to develop the very first heuristics! Many players of modern abstract games argue that they prefer to get into new designs rather than working out the well-established knowledge of a classic.

Core heuristics

I believe that many games have a core heuristic, whose understanding enables gameplay on a much deeper level. In other words, while there are manifold finely layered heuristics, one particular heuristic may provide a huge burst in understanding. Roughly speaking, a core heuristic is one that answers a player's query, "What am I doing here?" in the absence of much game-specific knowledge.

The classic example is the concept of life and death in Go. Try to imagine learning the rules but not hearing about alive groups. There is an immeasurable gain of clarity by just being aware of how groups can achieve eternal life. Accordingly, the two-eyes heuristic is taught extremely early. It is, in my experience, part of the immense appeal of Go. I believe that learning about life and death is so satisfactory because it provides moves with a purpose (to live or to kill), accessible to anyone beginning the journey. In their book *Deep Learning and the Game of Go*, the authors take the reader on a trip from a Python program playing random moves to one playing at dan level. Apart from the rules, the concept of two eyes is the only coded Go information—having that improves performance as much for a machine as it does for a human player.

For a Reversi player, a crucial lesson is the importance of the corners. Just as with the life of Go groups, this is a permanence property, and in fact stability in Reversi is the real core heuristic—corners are one pattern associated with it. That said, Ted Landau's handbook explains how it is often good to give corners away! By the way, in his guide of more than sixty pages, the square values given above are not used—for advanced play, these numbers are too crude.

In Boom & Zoom (*AG21*), being aware of the timer changes the understanding of the game completely. All kinds of follow-up heuristics ensue naturally, such as the subgoal of creating backwards opposing singletons.

The chain-scoring games Omega and Multiplicity compute the score as the product of all chain sizes of a player. This feels arbitrary and can become numerically overwhelming—the products can have four digits. Knowing one simple arithmetical fact changes everything: among numbers adding up to a fixed sum, the product is maximized when all factors are three, or as close as possible to three. Knowing this fact provides clarity—this core heuristic allows players to bring in connection and separation heuristics from many other games. For most games, it is undecidable whether the rules came first or the basic heuristic. In this particular case, I was able to ask Néstor Romeral Andrés and Christian Freeling, the designers of these two games, who confided to me that they were aware of the rule-of-three. So here, the core heuristic was conscious, not emergent.

I believe that designers and publishers are well advised to mention core heuristics together with the rule sheets, if possible. This makes it much easier for players to get into the game, increasing chances of further plays. Assuming the game is sufficiently deep, this will not detract from the joy of learning.

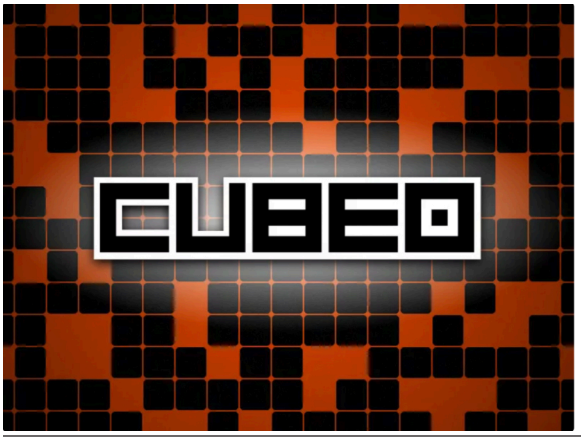
Verbalize thoughts when playing

If all fails, I find it useful to think aloud when playing. Unless your opponent is game, only do this in isolation, lest you'll attract psychiatric recommendations! Avoid aimless soliloquy; try to say out loud why you prefer a certain move. For unknown games, the reasons will be bizarre, sometimes arbitrary: perhaps a move reminds us of Chess; maybe it makes a nice symmetric pattern. With a little experience, reasons should become more sensible. Once your sentences start, "I play here because...," you may be following a heuristic. As explained before, heuristics may in fact be poor but that is all right: if the result is underwhelming, at least now you know another kind of move to shun.

Conclusion

There is much more to say about heuristics because they are the raw materials for many follow-up concepts. For example, conceptual depth is about the quantity of heuristics, and especially on their interdependency: we think of a game as deep it if has a many levels of heuristics building on each other. Clarity is about the accessibility of heuristics. But most importantly, I find it exciting to invent a heuristic for a new game and try it out in practice. ■

(The Acknowledgements for the Heuristics article are on page 23.)



Marek Kolcun's

...abstract game with dice as pieces

by James Nichols

It seems safe to assume that the readers of this magazine think of themselves as abstract gamers, perhaps even abstract game enthusiasts. I don't think I quite fit that mold. I am fascinated by abstract games, I love the simplicity and beauty they embody. I am often eager to learn how they are played. But after reading a synopsis, or looking over the rules, or watching a video review, or assembling a prototype, my interest almost always wanes.

That was until I found Hive, an abstract that not only grabbed my attention but held onto it. Since Hive has been featured in this magazine (*AG10*, *AG17*, and *AG20*), I am going to make the second assumption, that readers are familiar with how it plays.

Some five years ago, while I was still enjoying my exploration of Hive, I happened across a recommendation for a game called Cubeo. A brand new, self-published, pocket-sized game by Marek Kolcun that claimed Hive as its inspiration.

This tiny game, that only requires a handful of dice and a flat surface the size of a dinner plate, had much of what I loved about Hive, but was even simpler and more streamlined. In this article I will be making several comparisons between Hive and Cubeo. Just to be clear, I think that Hive is an excellent game, and I am very happy to see it getting all the attention that it has been receiving. I believe it deserves the title of modern classic. However, when I want to sit down with an abstract game, I don't go to my game shelves, I reach for my shoulder bag and pull out the Cubeo set that is always kept there.

Since my discovery of Cubeo, I have found a couple of dozen zero-luck games that can be played with 12 dice and Two-6D6 has become the name of that "game system"—see the BoardGameGeek. I like the idea of being able to play lots of games with a pocket-sized set, but, as it turns out, Cubeo is the only one I want to play whenever I pull it out.

In this article, I will explain the rules, make a few comments about Cubeo, and give a full annotated game. Firstly, here are the rules, lightly edited from the file available on BoardGameGeek. If you would prefer to learn the rules from a video, there is also an instructional video on BoardGameGeek.

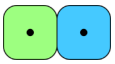
Rules

The components are two distinguishable sets of six 6-sided dice and any flat surface.

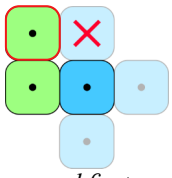
To win, you must either block your opponent from being able to make a valid move, or be the first player to merge dice to a value greater than 6.

Cubeo never ends in a draw, and always has a decisive result.

To begin, both players place one die, single pip up with value 1, in the centre of the playing surface, with both dice touching along a side. The other five dice of each player are the player's pool.



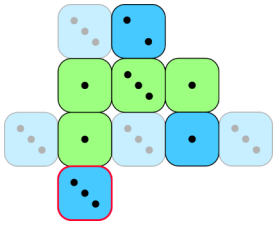
Starting formation



Green moved first; now it is Blue's turn. Blue can add a die to one of the two indicated positions, but not in the position marked with a cross, because the newly added blue die is not allowed to touch an opponent's die.

Choose a starting player. The players alternate turns. There are three ubiquitous rules that must be obeyed at all times:

- *The Single Formation Rule*: All dice in the formation must form a single group and be touching another die on at least one side.
- *The Pinning Rule*: Imagine removing a given die; if the remaining dice would break the Single Formation Rule, then that die is pinned and cannot move.
- *The Slide Rule*: To add (or remove) a die, it must be possible to slide it into (or out of) the formation without lifting it from the surface or moving any of the other dice.

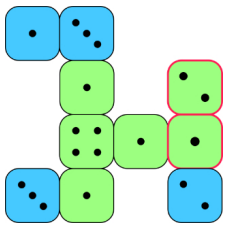


It is Blue's turn. Blue can move the bottom 3-pip die to any of the indicated positions. The Blue die must move three spaces, and can reverse direction. No die can finish its move in the location it started from.

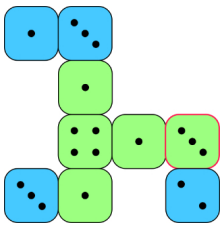
During your turn you must perform one of the following actions:

1. Add a die from your pool to the formation (always single pip up). The newly added die must touch at least one of your other dice, but cannot touch sides with any of the opponent's dice (diagonal corners are allowed). According to the Slide Rule, it must be possible to slide the die into formation from off the board.
2. Move a die that is not pinned around the outside of the formation according to the Slide Rule, one space (die side) for each pip (die value). The die must move its full value, but may change directions while moving. This move must change the formation.
3. Merge two dice, provided you have at least three dice in the

formation. You may add the values of two of your adjacent dice and consolidate them into a single die, removing one of them. Removing the die must not break the formation, so it must not be pinned. The removed die returns to your pool.



Green has all six dice in the formation, and must either move a die or merge two dice. The 4-pip and all the 1-pip dice would break the formation if they were removed, and are therefore pinned. Green decided to merge the marked 1-pip and 2-pip dice.



The green 1-pip die becomes a 3-pip die, and the 2-pip die returns to Green's pool.

Comments

A Cubeo set is inexpensive to put together and highly portable and accessible. Here is a set I put together (with my Two-6D6 logo). My most portable set weighs less than an ounce. The set in the image below weighs 3 oz. A Pocket Hive set weighs 8 oz and is much bulkier.

In Hive, the only victory condition is surrounding the Queen. If you cannot make a valid move, you just lose your turn. This is, strategically, a big difference between Hive and Cubeo. Beginning Cubeo players often focus too much of their early game on merging, discounting the power of the other victory condition: denying their opponent a valid move. Moving to pin and block can defeat an opponent who is overly focused on merging (especially in the early game). I often see this happen in games when I am teaching a new player.

I think of it as being analogous to a wrestling match with an additional win condition, such as solving a logic puzzle. If you start the match thinking too much about the puzzle, you'll be too slow and your opponent will pin you easily. You need to start by being focused on wrestling. Then think about the puzzle as the opportunities arise, while you are grappling. You cannot focus so much on the puzzle that you let your guard down. But you have to focus on it enough so that your opponent cannot come up with the answer first.

This is where I think Cubeo's depth is hiding. I do not have the where-with-all to determine whether Cubeo has the strategic depth of Hive. (I don't even know how that would be measured, although the interview with Stephen Tavener in AG20 has some interesting ideas.) Most people seem quite certain that Hive is deeper. It is likely they are right, but I doubt they have looked very deeply into Cubeo. For a short, tight game like Cubeo (the sort I have heard described as a knife fight in a phone booth), I find the surprising amount of depth very satisfying.

The first few moves, as with the openings of many abstract strategy games, can become a little predictable (there are really only two openings). But soon after each player has three dice in the formation, the game quickly turns into that unpredictable mental wrestling match, complete with advancing threats, setting up traps, posting guards, and finding sneaky ways to free your dice and escape. It is often hard to tell who has the advantage, and (like a good wrestling match) one unanticipated move can flip things around. I have been playing Cubeo for five years now, and I am still learning.

As with Hive, there is no capturing or attrition. But with Cubeo, merging dice has the double benefit of bringing a die back into your pool to be redeployed on a later turn. One of the pitfalls that you will learn early on is how dangerous it can be to have all six of your dice in the formation. When that occurs, you only have two options on your turn instead of three, and that can be a big step toward having no valid move, and defeat. Of course it is also hazardous to have too few dice in the formation, another tricky balancing act, and another source of depth.

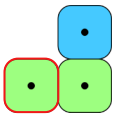
With only a handful of common dice and one page of rules, Marek has managed to create a game that I am finding more compelling than the "modern classic" that inspired it. You can see that Cubeo and Hive are siblings, but as with so many siblings, they are decidedly unique individuals.

There is further discussion of Cubeo here on BoardGameGeek.

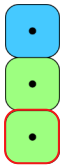
Annotated game

We show an annotated game move by move below. Nevertheless, some people have difficulty following Cubeo moves from one image to the next, especially later in the game when there are more dice in the formation. I strongly suggest grabbing some dice and physically making the moves for each turn. It is surprising to me how much more immersed in the game I become when I'm handling and seeing actual dice.

As I mentioned in my article, Cubeo really only has two openings. On a player's first move, the player may only add a die to the starting formation. At the start, players do not have enough dice in the formation to merge, and moving would only rotate the formation. So they have the choice of two effectively different spaces to which they can add their die. The most commonly chosen is what I call the "close opening," placing the new die to the right or to left of the die of the player's colour that is already in the formation. These two spaces are mirror images and therefore are strategically the same.



Close opening



Far opening

The second opening is what I refer to as the "far opening." This may appear to be a weaker or more timid opening, but in my experience, it is just a different strategic path, not a weaker one. It may be effective if you feel the need to shake up the way you play.

For this example game, I will use the close opening so I can explain the next concept, "mirroring." (Another reason to use the far opening is that it will avoid mirroring.) Green moves first from the starting formation. Green's moves are shown in the left diagrams below; Blue's moves are shown on the right.

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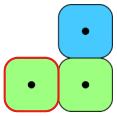

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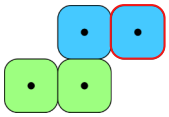
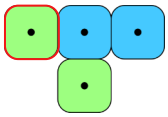


Once the first player has chosen the close opening, the second player has only two spaces available to place a die, close (opposite side from Green, as shown in Move 2, above) and far. The choice is similar to the two opening options, and again it

does not matter much which one Blue chooses. Either way, the second player is likely to end up in the same mirroring situation. Blue continues to mirror Green with the next few moves.

(3)



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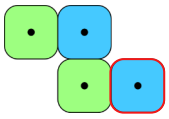

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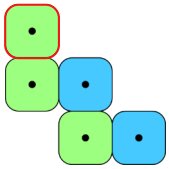

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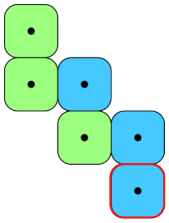

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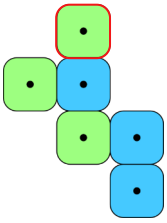

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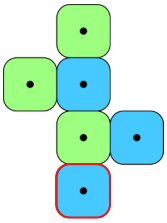
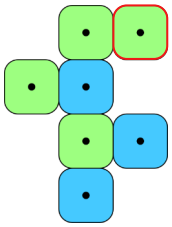


The players are still mirroring each other. Mirroring can feel like a mindless tactic, but I think of it as analogous to opponents circling each other at the start of a wrestling match. Except that Green, being one move ahead (leading the placements), has the advantage—continuing the mirroring pattern too far will result in a superior position for Green. So it is up to Blue to decide when best to break the mirror. Once the mirror is broken, we enter the middle game, and things become much less predictable.

(9)



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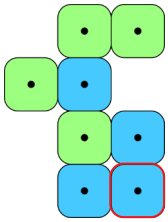
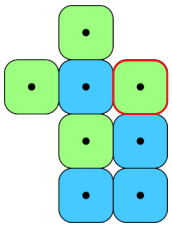


Blue has broken the mirror at Move 10.

(11)



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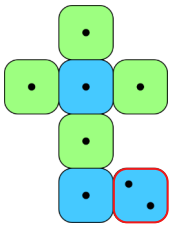
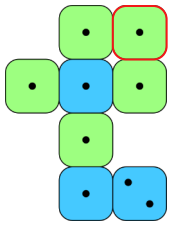


Green responds with a "cross formation" on Move 11. The cross formation is often seen as being very difficult to beat. However, the more I study it, the less I believe this to be the case. It is true, of course, that a cross cannot be pinned and blocked with only six dice. Also, it leaves the player with at least one, but in this case two dice, to continue to add and merge. But the cross is not as stable as it seems, and it is often easy to break up. In this game, Blue simply ignores it and gains the lead on merging, stealing Green's tempo advantage.

(13)



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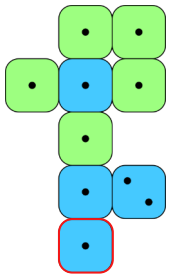

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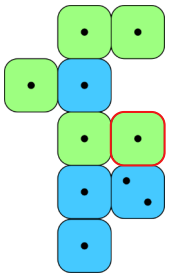

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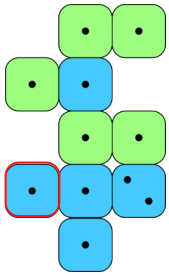
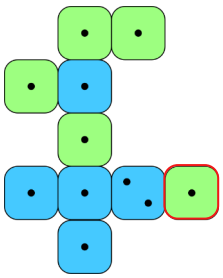


Green realizes the tables have been turned at Move 15. Green is now in the awkward position of having to deconstruct the cross to have the dice needed to pin down Blue's merge threat that is accumulating at the bottom of the formation.

(17)



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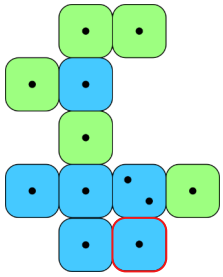
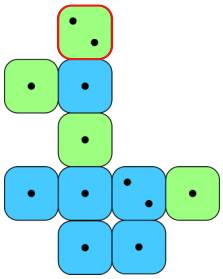


After Move 18, Green may be considering moving the 1-pip die (on the left side of the formation) down to threaten to pin the blue 1-pip die on left side of Blue's merge group at the bottom. However, the green 1-pip would likely just get pinned there (thus Blue's 1-pip is acting as a "guard" for the left side of the group). So Green instead chooses to merge up for greater mobility, with the hope eventually of being able to pin Blue's merge group in a longer distance move.

(19)



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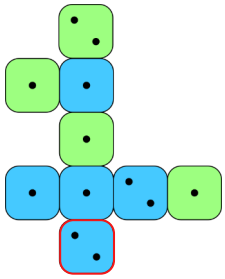
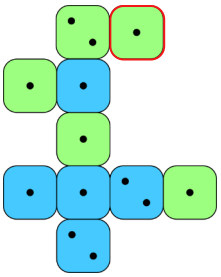


You will notice that every time Green merges up, Blue answers with another merge in order to keep the tempo.

"...wine loved I deeply, dice dearly." ~ William Shakespeare, *King Lear*

(21)



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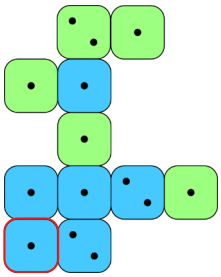

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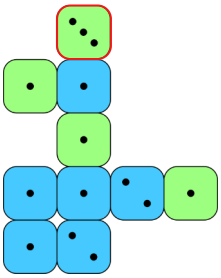

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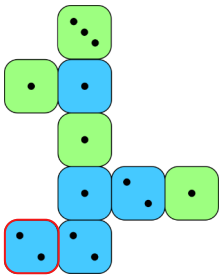
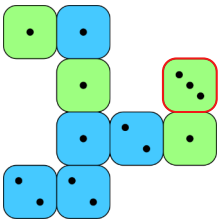


Things have changed enough that Green will decide to go around the right-hand side of the formation with Move 25.

(25)



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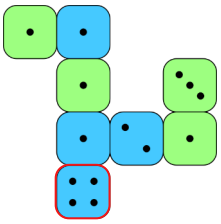

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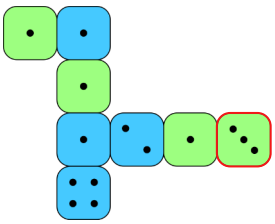

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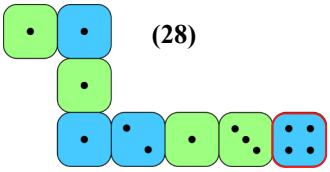
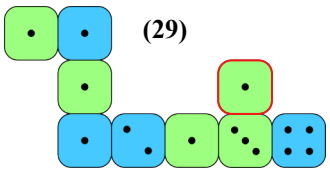


Now that Blue has merged to a 4-pip on Move 26, Green moves the 3-pip into a threat/sacrifice position on Move 27. The green 3-pip is now within striking distance to pin the four threat, but it is also within range to be pinned by the 4-pip as a sacrifice. Blue opts to take the sacrifice, with Move 28. This pulls the 4-pip away from Blue's other dice, slowing the merge down. Green is hoping to be able to isolate and pin the 4-pip.

(29)



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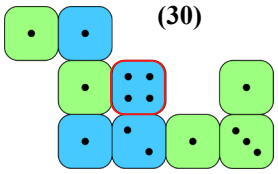
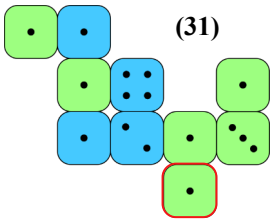


Green adds a die threatening to pin the 4-pip, with Move 29, but Blue just moves around it with Move 30, landing above the blue 2-pip and threatening to merge to a 6-pip.

With Move 31, Green adds a die at the bottom of the formation to guard the would-be 6-pip, blocking the space below the blue 2-pip for adding a die from the pool.

But, with Move 32, Blue switches from the merging-up strategy to the pin-and-block strategy.

(31)



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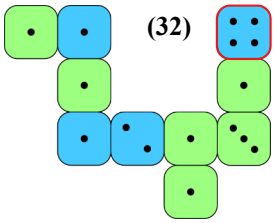
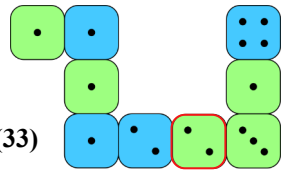


Blue could have made the move to this position back on Move 30, but at that time Green still had a die in the pool. This would have allowed Green to add to the inside-corner (diagonal upper-left from the green 3-pip), thus freeing the green 3-pip. Once Green added the die at Move 31, and had all six dice in the formation, this was no longer a threat.

(33)



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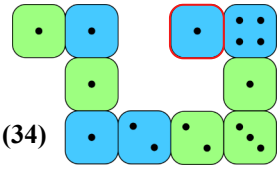

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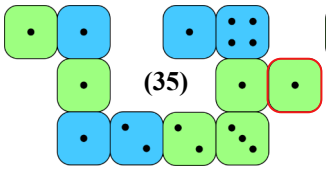

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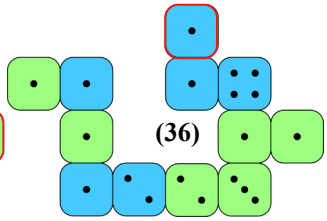
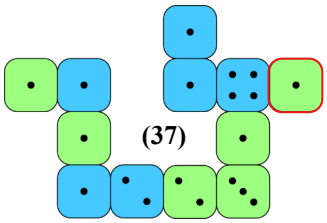


Green merges with Move 33 to get a die back into the pool. Blue keeps building, there are still two free green dice Blue needs to pin.

(37)



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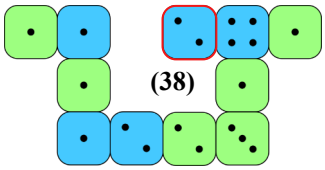

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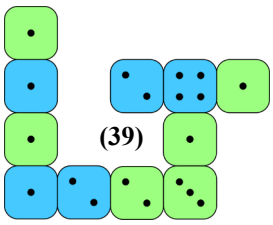

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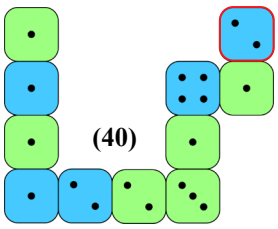
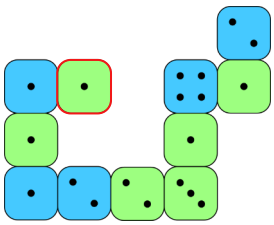


Green has accepted the inevitable by now, but dutifully tries to avoid being pinned for a few more moves.



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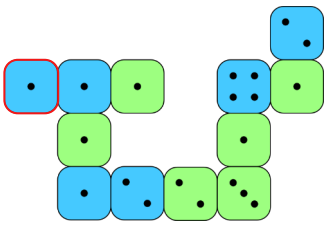

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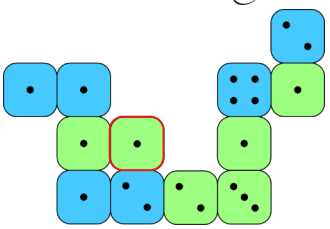

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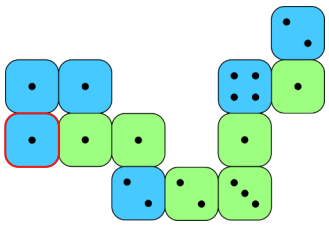


(44)

With Blue's Move 44, Green is now completely pinned and has no move available. Blue wins.

Conclusion

I hope this game adequately demonstrates the need and benefit of switching between two strategies (the two victory conditions), how important it is for the second player to pay close attention to the timing when breaking the mirror, and also how having all six dice in the formation changes the dynamics of the game.

If you followed my suggestion and pulled out some dice to play along with this annotated game, you already have a Cubeo set in hand. Otherwise, just grab a few dice, and you have an interesting strategy game you can take anywhere! As I mentioned at the beginning of this article, Cubeo is currently an obscure game. Users on BoardGameGeek generally consider a game obscure if it has fewer than 500 ratings. As of this writing Cubeo has 48 ratings (Hive has 30,000). You won't find Cubeo packaged on the shelf of your local game store—but you can probably buy dice there. An online search will lead you to the BoardGameGeek Cubeo page, not Amazon. As of this writing, there is no Cubeo smartphone app and Cubeo is not on any of the online game sites. BoardGameGeek user, Love Brandefelt, has created what looks to me to be a very good digital AI version that can be downloaded here for Windows or Linux. I have played a few asynchronous games using the BoardGameGeek forums. Fortunately, BoardGameGeek's emoticons include all the faces of six-sided dice in both black and white, and the blank Scrabble tile works as a spacer. ■

Acknowledgements

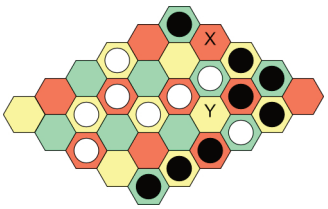
Cubeo on BoardGameGeek: https://www.boardgamegeek.com/boardgame/191916/cubeo
Two-6D6 system on BoardGameGeek: https://boardgamegeek.com/geeklist/236514/random-orders-two-6d6-game-system
Cubeo instructional video: https://www.boardgamegeek.com/boardgame/191916/cubeo/videos/all
Cubeo rules on BoardGameGeek: https://www.boardgamegeek.com/filepage/129533/cubeo-english-rules-re-edited

Acknowledgements for Mirador, page 35

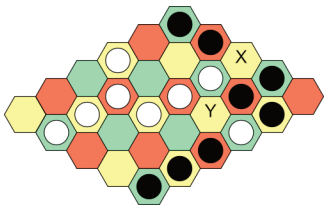
SuperDuperGames: http://superdupergames.org/main.html?page=about
Mirador on BoardGameGeek: http://superdupergames.org/main.html?page=about
Description of Mirador by Andrew Perkis: http://superdupergames.org/rules/mirador.pdf
Record of annotated game:http://superdupergames.org/main.html?page=archive_play&gid=30664
Record of game with four-move win: http://superdupergames.org/?page=archive_play&gid=34053&idx=7

(Jed, continued from page 25)

(Player A chooses to play black or white at X, according to whether she is Cross or Parallel.)



Simple chilling in Jed



Complex chilling in Jed

In the diagram to the right, however, both spaces of the chilling pair are the same colour, Yellow. The chilling fault still exists. In regular Jade, the whole board is eventually filled up aside from the chilling pair. In this particular situation in Jed, however, a green and red space will be left unfilled before one player or the other is forced to move to ***X*** *or* ***Y****.*

Chilling can still occur in Jed. However, the author thinks it will be far less frequent than in Jade. Interestingly, if the first space played to in the game is J, say, then the final sequence in the chill situation must be D-J-E-D. Therefore, from the start the players must know the identity of any future chilling pair. If J is played to first, the chilling pair will be D's; if E is played first, the chilling pair will be J's; if D is played first, the chilling pair will be E's. Perhaps this insight can factor into the play. The first player will always win in a chilling pair situation. The second player will know the colour of the chilling pair and must avoid its creation. Will this influence strategy? Maybe it would at an advanced level.

On the standard 9x11 board size, Parallel needs a minimum of 18 stones for a win, whereas Cross needs 19. The difference in number of stones needed to win does not necessarily mean that Parallel has the advantage. Indeed, it was thought initially, in the old days when Jade was played, that Cross rather than Parallel would have the advantage. Mark Thompson says of this,

"It's been a long time since the 9x11 board dimensions were chosen, and I don't recall now whether your observation about number of stones for a winning pattern was considered or not. To my best recollection, I didn't feel as confident as other players did that 9x11 was going to prove to be equally balanced: I think it would require much more testing to say. It seemed to me that Cross has an innate advantage on a rhombic board but that Parallel would "clearly" (or is it really clear?) have an advantage on a very long and thin board, and therefore presumably some aspect ratio would provide a reasonably equal game, to the limits of human players, which is all I'd be interested in. (Of course no abstract perfect-information drawless game can ever be balanced if completely analyzed.)

"I've forgotten my 20-years-ago reasons for thinking Cross has an advantage, apart from board shaping, but it might be because Cross only needs a group of one colour to be strong, while Parallel needs groups of two colours—though they don't need to be quite as strong as Cross needs his to be. But this means Parallel has less effective choice about which colour to play each turn: Parallel needs a balance of influence between White and Black, while Cross needs one colour to dominate. Hence Cross may get more benefit from a move switching colours, and using a kind of jiu jitsu to take advantage of the strength Parallel has already invested in that colour." ■

Either way, Jed offers a different approach to a Hex-type game, involving shared pieces, asymmetrical objectives, and unequal board spaces, surely an unusual combination! ~ Ed.

A game by Andrew Perkis: Mirador

Introduction by Kerry Handscomb
Game annotation by Paul van Wamelen

Mirador is an unusual, and perhaps even foundational, connection game designed by Andrew Perkis and initially published in the January 2010 edition of *Games* magazine. The game has been playable on SuperDuperGames since it was developed, and it has a BoardGameGeek page, but otherwise Mirador is little known. The same is true of Andrew's game Alfred's Wyke, which we presented in *AG21*. These games are two of the very best from this designer, and they deserve continuing recognition, in my view.

Mirador is interesting especially because it uses line-of-sight connections, in the same way as Sid Sackson's Network, first published in his classic book, *A Gamut of Games*. The recent territorial games Tumbleweed (*AG21*), Stigmergy, Lox, and Meridians also use line of sight, which has become a popular theme to investigate. In addition, Mirador is a connection game on a square board, where the objective is to connect either pair of parallel opposite sides of the board, a property that it shares with Gonnect (*AG6*), Tak (*AG17*), and Bridget, the latter reviewed on page 2 in this issue.

We will be giving the rules of Mirador, rewritten, but inspired by Andrew's own description. We will follow up with a game annotated by Paul van Wamelen, which ought to give the reader a good feel for Mirador and how it works.

Rules

Mirador is a connection game played on a 27x27 square grid. Andrew Perkis originally described Mirador as a pencil-and-paper game, and this might still be the easiest way to play the game in physical form, although it ought not to be too difficult to put together a set with solid board and pieces. There are two players, who we will call Green and Blue for the purpose of this article.

On each turn, a player fills in a 2x2 square in the player's own colour. Each of these completed 2x2 squares is a *mirador*. Miradors cannot overlap; a mirador cannot even touch another mirador of either colour, except for the single exception that miradors of the same colour can touch at their corners.

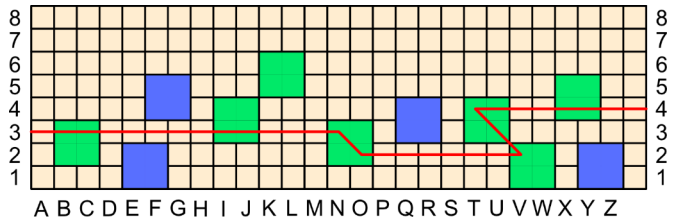
For the notation, just the bottom left corner square of a mirador needs to be recorded, which means only that the first 26 squares on the horizontal and vertical axes needs to be identified. The size 27x27 is an unusual choice, perhaps inspired by the 26 letters of the alphabet in English. On the other hand, Paul van Wamelen begins the annotated game with an explanation of why 27x27 might be absolutely the ideal size for Mirador. Paul muses whether the designer understood the full implications of 27x27. If the size was chosen just to fit the length of the alphabet, it was a very fortuitous choice.

Green moves first, and the pie rule is used to balance the advantage of the first move. In other words, after Green's first move, Blue can decide either to switch sides and play Green, with the existing placement as Green's first move, or to stay as Blue and make the next move as Blue.

If there is an unobstructed line of sight between two miradors of the same colour, then these two miradors are *connected*. The "lines of sight," of course, must be parallel to the sides of the squares forming the grid. Likewise, if a mirador has an unobstructed line of sight to any square on the side of the board, then the mirador is connected to that side. Two miradors of the same colour touching at their corners are also connected.

In the lines of sight indicated in the diagrams below, you will note that I have drawn the lines through the *centres* of the small squares. A line of sight should be thought of as running across the board a full small square wide—the exception, of course, is the diagonal connection between friendly miradors.

The object of the game is to use the miradors of your colour to construct a series of unobstructed line of sight connections between two opposite sides of the board, either horizontally or vertically. Of course, the diagonal connections between friendly miradors can also form part of the the winning connection. This connection must be unassailable, unbreakable whatever the opponent does.

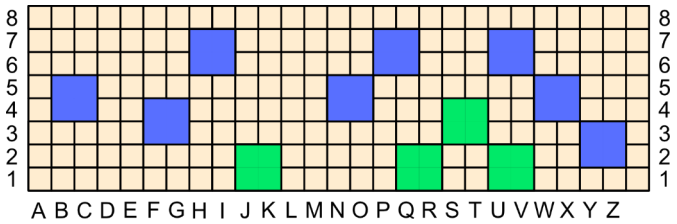


Green has a secure horizontal connection; no Blue move can break this connection.

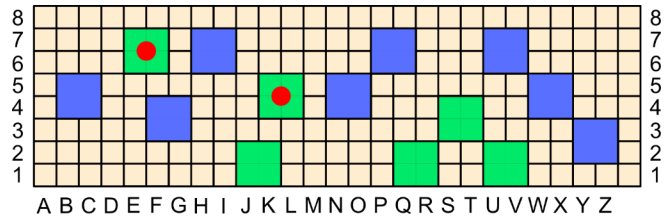
Green's wining connection, above, could also be vertical. Likewise, Blue can make winning connections horizontally or vertically.

After a player has made a move, if that player thinks she has a winning connection that cannot be broken, then that player can "Declare." The other player then places as many miradors in his colour as he likes in an attempt to break the connection. If he cannot, the declaring player wins; if he can break the connection, then he wins instead. See the example below. Blue, thinking she has a winning horizontal connection, declares.

However, now Green gets to place some miradors to try to break the connection. You can see, by the two green miradors below marked with red dots, that Blue's declaration was premature and that Green has now won—the Blue connection is broken!

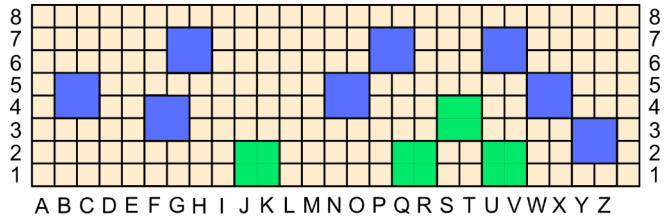


Blue declares prematurely.



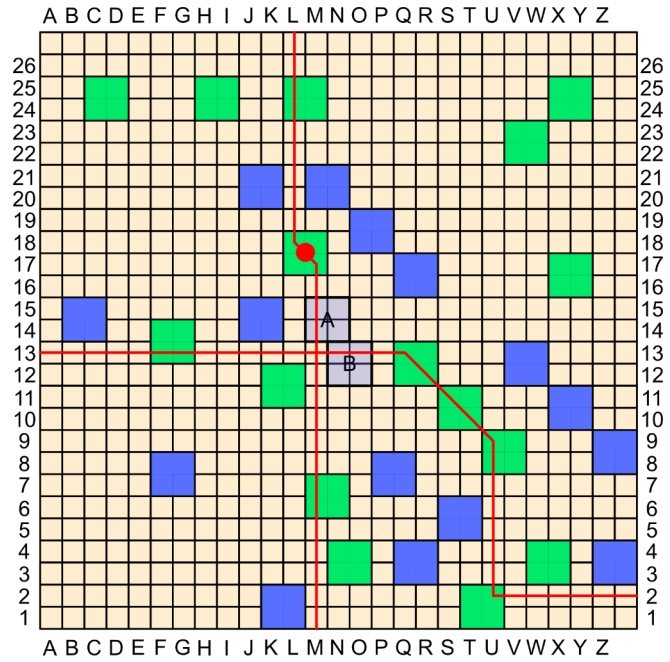
Green breaks Blue's connection.

With the small change, below, with just one blue mirador moved one square to the left, Blue's declaration would be sound. Why don't you try to break the Blue connection? Remember, no two miradors can touch along their sides, and only friendly miradors can touch at their corners.



Blue can make a sound declaration.

A player can declare and be threatening horizontal and vertical connections simultaneously. The player does not have to specify which she is aiming for.

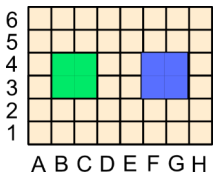


Green threatens horizontal and vertical connections.

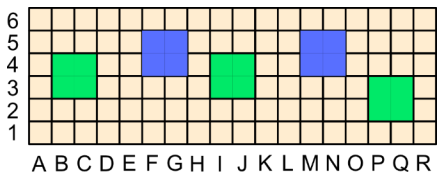
See, for example, the diagram above, where Green has just placed the mirador marked with the red dot and declares. Green is now threatening both horizontal and vertical connections. If Blue plays at **A**, he blocks the vertical connection; if Blue plays at **B**, he blocks the horizontal connection. No Blue placement, or even a series of Blue placements, blocks both connections, and Green's declaration is thereby sound.

Comments

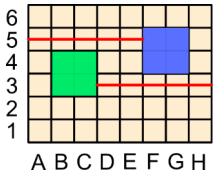
The designer had developed a nomenclature for certain types of mirador placement. I will review some of this terminology, so that any future discussion of Mirador will have the beginnings of a language. See below for *blocking*, *peeping*, and *leapfrogging*, the meaning of which should be clear without needing further explanation. Locations where only one of the two players can place a mirador are moves that can be held in *reserve*—see the annotated game for a further example of a reserve placement.



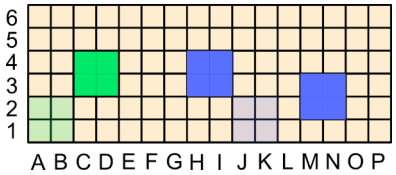
Blocking



Leapfrogging

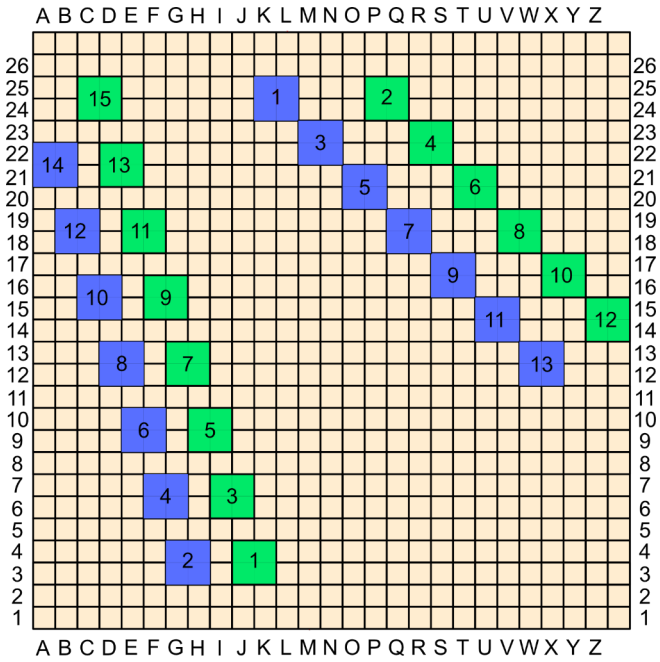


Peeping



Reserves

See the diagram below for two types of ladder found in Mirador. The designer notes that the ladder on the left is slower and provides peeping opportunities that may benefit the other player.



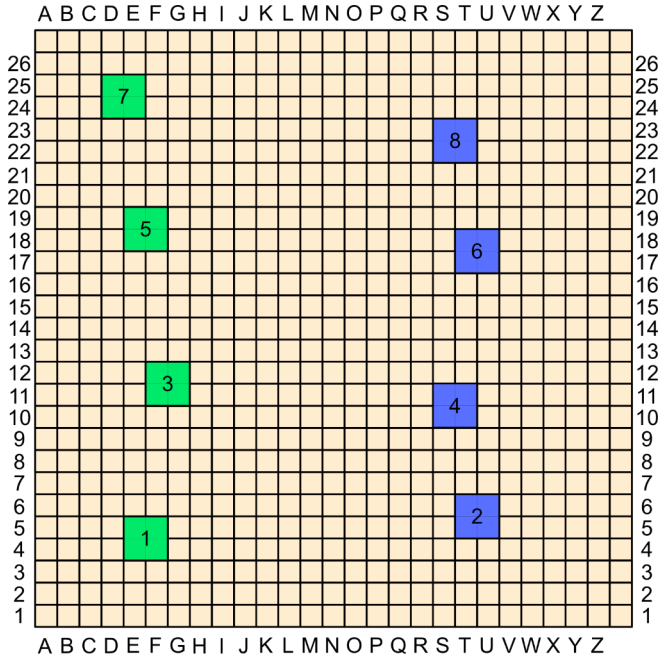
Ladders

Without further ado, here is the game annotated by Paul van Wamelen. This game was played between fritzd (Green) and pim (Blue) on SuperDuperGames.

Annotated game

I think we are only starting to understand this game, but below are some thoughts and explanations of what we have learned so far. The game was the last one in a long sequence that were played between the two highest rated players on SuperDuperGames.

First a bit of an introduction that explains the first move. One of the basic patterns of Mirador is demonstrated with this game from SuperDuperGames, shown below. Blue has just declared, and Green resigns. No series of placements by Green can prevent Blue's winning connection. You can create an unassailable connection in just four moves!



Blue wins with only four miradors!

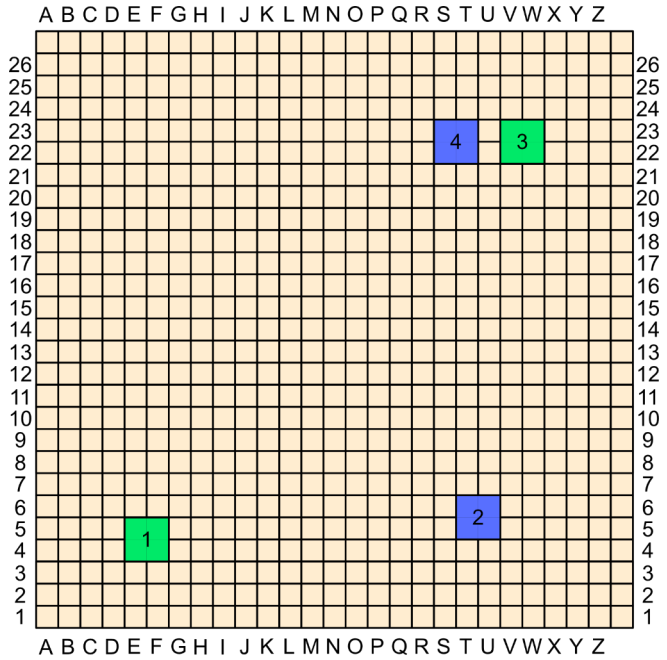
The balance is very delicate. If the board was one more square wide, you would need five moves, and if the board was one less square wide, you would probably have more options of connecting in just four moves. For this particular board size there is only this one four move connection where the pieces have to be aligned in exactly this way to be connected. (Did the designer know this!?)

It also seems that the **T5-S10** arrangement, the first two moves of Blue above, where the opponent has no pieces defending toward the top side, is extremely strong, possibly already winning.

This all means that if a player places a piece four squares from a side, you should already be thinking about defending! If the first move is played at **E5**, you cannot defend in both directions, and you might already be lost. So **E5** is too strong a first move, and the opponent will always swap sides.

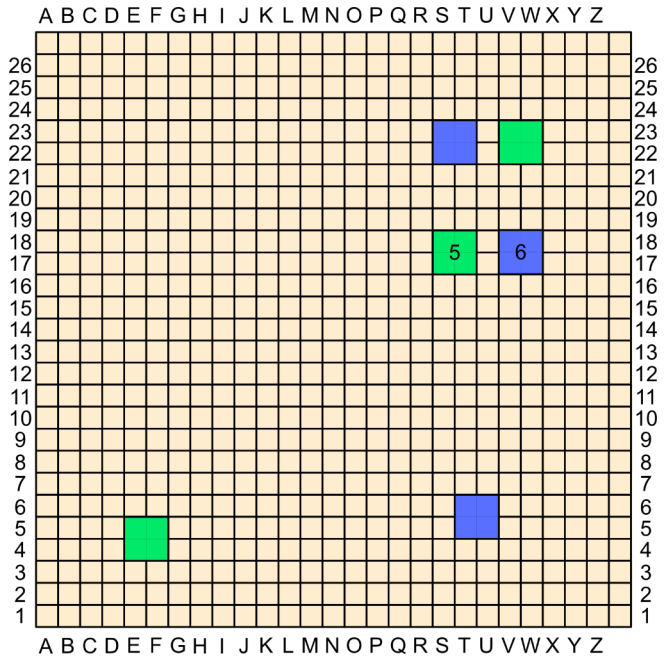
On the other hand, something like **D4** is too weak, because the opponent will play in the opposite corner at **V22** and have a double attack. Therefore, something like **E4** seems ideal. The second move then defends by playing in the lower right area. This is how our annotated game starts, and now you know why:

1. E4 (*Seems like a good start—not too weak to attack, not too strong to be immediately swapped.*) **2. T5** *(Defending the four move connection threat across the bottom, and setting up a four move connection towards the top.)* **3. V22** *(Defending the top to bottom threat, while creating a left-to-right threat.)* **4. S22** *(Defending and attacking. Somehow having the S22 and T5 parts of the basic four-move connection is much easier to defend than having, say, T5 and S10.)*



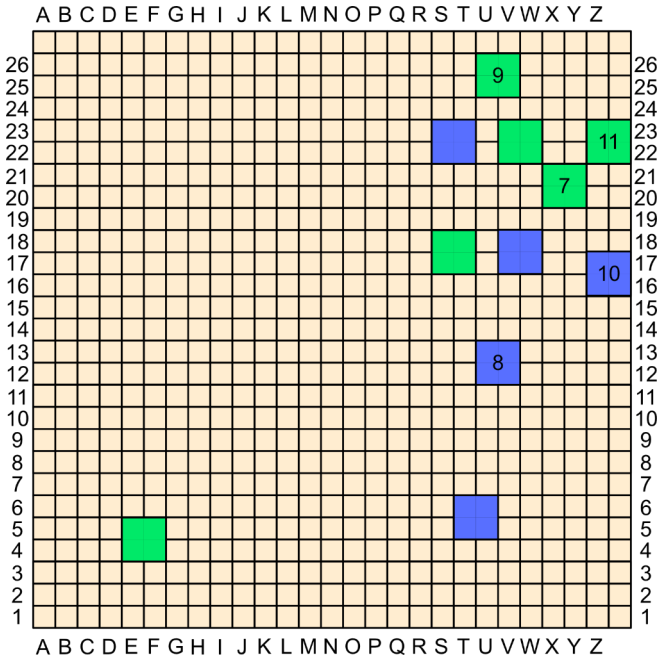
Blue defends and attacks with 4. S22.

5. S17 *(Defending the top to bottom threat in a very straightforward way. Note that S19, for example, would also work, but S17 might be stronger because it leaves room for a possible U19.)* **6. V17** (*For now, there is a perfect stalemate in the top right. All four pieces are blocked left-right and top-bottom.)*



A stalemate in the top right

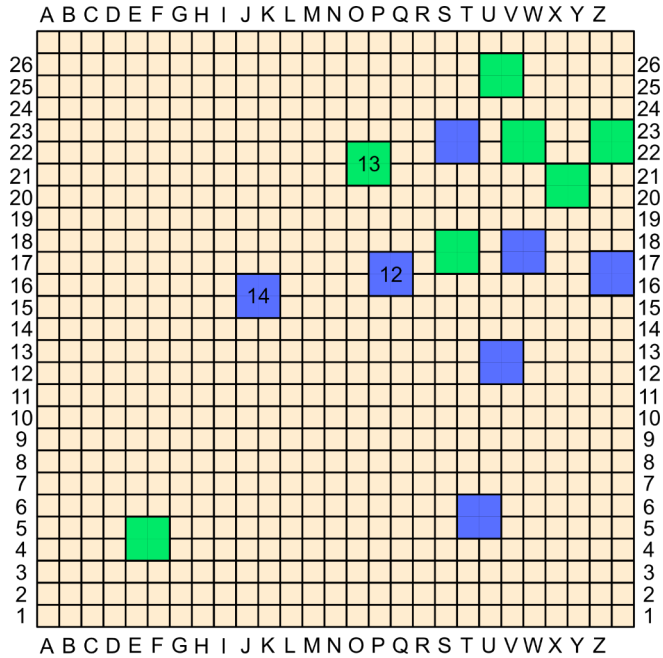
7. X20 *(The X20-V22 group is now securely connected to both the top and the right of the board and peaking at the bottom and the left.)* **8. U12** *(Blue is not unassailably connected to the bottom yet, but resistance in that direction is probably futile. On the other hand, it seems trivial to block towards the top—so trivial that it almost seems like a poor move. But….)* **9. U25** *(Blocks U12's view to the top. Note that Blue cannot even add any pieces between U12 and the top in order to renew the threat.)* **10. Z16** *(Note Z16 is essentially connected to the bottom (through V17, etc.), and is threatening something like Y24 that would connect to the top. So Green is forced to block. Fortunately, that is again trivial and seemingly in such a way that no follow up seems clear.)* **11. Z22** *(Green is playing forcing moves, but the top looks completely blocked now. Where is this going?)*



Green continues to play forcing moves in the top right.

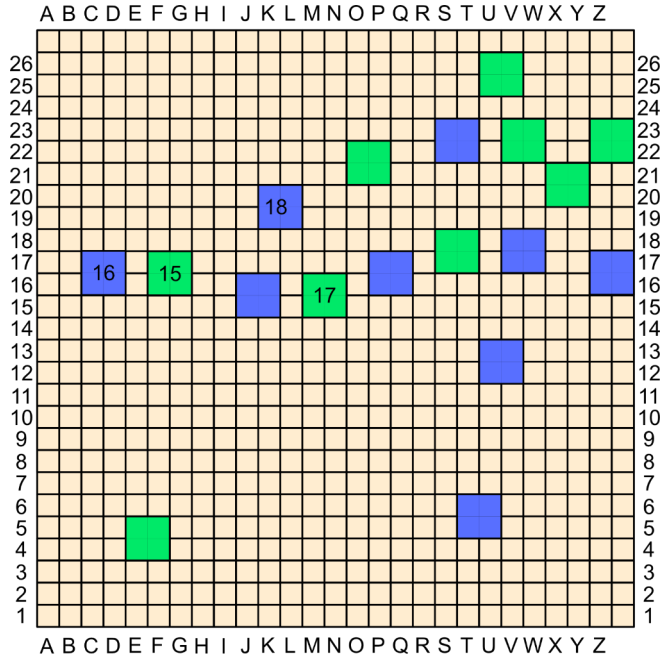
12. P16 *(Oh! Looks like Blue is now threatening a run across the board—P16 is already fully connected to the right. But there is also the immediate threat of something like Q20—because P16 is also already virtually connected to the bottom through Z16, V17.)* **13. O21** *(Blocks the connection to the top (and in such a way that renewing the threat seems impossible. Note that there is no way Blue can prevent Green from playing at Q19 at some future move). It also sets up a left-to-right threat for Green. O21 is connected to the right. Unfortunately it is only one square ahead of the Blue left-to-right threat, and seeing as it is Blue's move, that is probably not enough. Let's see how Blue finishes this off.)* **14. J15** *(This is part of the 4-9 connection to the left, but the hole to P16 seems a bit big…. Or is it? If Green plays at M15, Blue just wins with E16. What if Green plays M16? Blue still wins with E16! After M16, the J15 mirador can see the right side of the board without touching another Blue piece and without Green being able to play anything in the line of sight!)*

*We have discussed four games by Andrew Perkis in total, Miller's Thumb (*AG9*), Super Halma (*AG15, AG18*), Alfred's Wyke (*AG21*), and now Mirador. Super Halma is a valiant attempt to make a serious competitive game from the Victorian classic. Andrew is now retired from game design, having given us many unusual and original creations. At the very least, Alfred's Wyke and Mirador should not be permitted to slip into obscurity, in my opinion. ~ Ed.*



Blue makes a secure connection to the right.

15. F16 *(This threatens J15's connection to the left, but more importantly makes it so that later playing at M15 will break the connection between J15 and the right.)* **16. O16** *(Securing J15's line of sight to the right.)* **17. M15** *(As promised. This looks good for Green, doesn't it?)* **18. K19** *(Wow! There is no way Green can prevent Blue from playing at N18 next, which is a reserve placement for Blue, completing the Blue connection.)*



Final position, and a Blue

Header mage: The Lighthouse of Alexandria, one of the Wonders of the Ancient World. Johann Bernhard Fischer von Erlach, Public domain, via Wikimedia Commons:https://commons.wikimedia.org/wiki/File:Pharos_Alexandria_(Fischer_von_Erlach).jpg
See page 34 For Mirador acknowledgements.

Penchant

Reviving a game from the past that feels modern

by Jonathan Kandell

The Bezique family of traditional card games garners much nostalgia. For some it's memories of grandparents playing Pinochle in smoke-filled room with money at stake and cussing; for others it's a spirited game of Bezique.

The best known of the family is Auction Pinochle, a terrific partnership game popular among American immigrants in the early 20th century. The two-player game of Bezique reached its peak of popularity in the 1860's, but still has fans today. Bezique got more extravagant over time, as single decks became double-decks and then quadruple decks in Rubicon Bezique. The even larger Six-pack Bezique is said to have been Winston Churchill's favourite game. Other related card games worth exploring are Schnapsen (*AG20*), Ulti, Marias, and Tartli.

The origin of these games is still debated, although there is a general consensus they evolved from the medieval game of Piquet and expanded in different directions from the French Atlantic coast game of Cinq-Cents. All the games share the addictive mechanic of "trick and meld," where winning a trick gives one the ability then to go on to meld scoring combinations—creating a foundational dilemma on how to use one's cards. The games in this family also reserve a special place for the unusual scoring combination of Queen and Jack, with an implied cheekiness of illicit romance.

The two-player game of Penchant, invented in 1893 by "Jack Smarte" (pseudonym of John Smith McTear) is a "lost" game of the family, largely unknown today, yet one of its most refined and skillful. McTear was a British game expert who wrote for the journal *Notes & Queries* (a sort of Reddit of its day). He published the rules and strategy in an 1897 book of the game's title, and the game was included without attribution in R. F. Foster's *Hoyle's* of that period. (The name likely alludes to the Queen's romantic penchant for the Jack, as well as its role in setting trump.)

Bezique is a fun game, but Penchant is what to play to show your skills. Its stripped-down deck, unusual scoring, method of setting trump, and the addition of barring add extra dimensions of skill to the basic Bezique framework. Considering its age, Penchant plays surprisingly modern, with the tight feel of an abstract.

Rules

Deck

Penchant is played with a 32-card Piquet deck, 7 through Ace of four suits. From an ordinary deck remove the 2's through 6's. The cards rank 7 (low), 8, 9, T, J, Q, K, A (high). (This is different from the A-T-K order of the rest of the family.)

Goal

The object of Penchant is to score the most points in four hands of play. Players score for declaring combinations (*melds*), and for winning Aces, Tens, and Sevens (known as *Brisques*) in tricks. A Cribbage board or Poker chips allows easy scoring.

Deal

The players cut for deal, with the highest dealing. The deal alternates over the four hands. Six cards are dealt face down to each player, one by one. The remaining 20 cards are placed face down between the players and constitute the stock.

Play

Each hand consists of two phases: the first ten tricks (Phase 1), and an end-game of the last six tricks (Phase 2).

Phase 1: First Ten Tricks

Phase 1 consists of playing tricks, melding combinations, and drawing from the stock, until the stock is gone.

Non-dealer leads any card. A trick is won by the best card of the suit led or the highest trump. Cards do not have to follow suit, you do not have to play trump, and you do not have to win. As tricks are won, the Brisques are sifted out, and spread face-down near each player so as to be countable by both players. The remainder of cards won are discarded to the side and are not needed for the rest of the hand.

The play starts off with no trumps, and trumps are determined by the suit of the Jack in the first Penchant melded by the winner of a trick (see below).

A player may lead to a trick or respond to a trick using either a card from her hand or by using a card on the table that was previously melded.

Melds

Winning a trick gives the winner the privilege of declaring one meld, which is laid on the table and scored immediately. A player's melded cards are kept face up in front of the player and are effectively still part of the player's hand.

To make a meld, one or more cards have to be added from the hand to form a combination. Only one meld can be scored in any turn and, in contrast to Bezique, melds cannot be scored without adding a new card.

There are three classes of melds, *sets*, *runs*, and *couplings*. (I have taken the liberty of updating some of the arcane 19th century terminology of the original.)

A card already melded on the table can form part of a

succeeding meld so long as you add one or more cards from the hand after a trick. Thus, with a pair of Queens melded, for example, you can add a third Queen for a Triplet. However, you cannot first meld the Triplet of Queens and then score a Pair with two of them without adding a new card. However, with the pair of Queens already melded, you could add a King matching the suit of one of them to form a Marriage, and so on.

Suppose, on the other hand, you have the two Queens on the table and a third is added that happens to match the suit of a King that is part of another meld. Only one combination can be scored for every trick won. Thus, you can score the Triplet, but you cannot later score the Marriage since you did not add at least one card.

SETS OF THE SAME VALUE

Name	Description	Example	Points
Pair	Two of a kind	♠9, ♣9	2
Triplet	Three of a kind	♥T, ♠T, ♣T	3
Quadruplet	Four of a kind	♥K, ♠K, ♦K, ♣K	10

RUNS OF THE SAME SUIT

Name	Description	Example	Points
Family	Three card suit sequence of J, Q, K	♠J, ♠Q, ♠K	3
Clan	Four card suit sequence, must include J, Q, K	♦T, ♦J, ♦Q, ♦K	4
Extended family (i.e., Flush)	Five cards of the same suit, must include J, Q, K	♣7, ♣9, ♣J, ♣Q, ♣K	5
Reunion	Five cards in suit sequence, must include J, Q, K	♥T, ♥J, ♥Q, ♥K, ♥A	25

COUPLINGS

Name	Description	Example	Points
Marriage	K and Q of same suit	♥K, ♥Q	2
Besito	Q and J of same suit	♣Q, ♣J	2
Penchant	Q and J of different suits	♦Q, ♣J	1

This is different from Bezique, where the requirement to score for a meld is just to win a trick with the meld possibly already on the table. In Penchant, to score for a meld you have to win a trick and also play a card from your hand to contribute to that meld.

A card already melded on the table can form part of a succeeding meld together with one or more cards added to it from the hand after a later trick the player has won. Thus, with a pair of Queens melded, for example, you can add a third Queen for a triplet. However, you cannot first meld the triplet of Queens and then score a pair with two of them. Otherwise, with the pair of Queens already melded, you could add a King matching the suit of one of them to form a Marriage, and so on.

Suppose, on the other hand, you have the two Queens on the table and a third is added that happens to match the suit of a King that is part of another meld. Only one combination can be scored for every trick won. Thus, you can score the Triplet, but you cannot later score the Marriage since you did not add at least one card.

Trump

As mentioned above, trump is determined by the suit of the Jack in the first Penchant melded by the winner of a trick. The Penchant, moreover, is the one exception where you must win a trick to meld a combination. Even if your opponent has won the trick, if you have a Penchant you can meld it providing the trick winner did not declare any melds. However, a Penchant melded in a trick you did not win does *not* determine trumps.

Phase 2: Last Six Tricks

The second phase of play starts the moment the last card in the stock is drawn.

At this point the various melds are drawn back into the players' hands. No more combinations can be scored.

The last six tricks are played out according to different rules, with the winner of the last trick of Phase 1 leading to the first. Players must follow suit if they can, must trump if they cannot, and must win if they can. Otherwise they may play any card.

Won tricks in Phase 2 are displayed spread face up as won so they remain visible. The aim of Phase 2 is to win as many Brisques as possible. Brisques won in Phase 2 are called *Brisquettes*.

After the six tricks are played, the score is tallied and the hand is over.

Scoring

Melds are scored as they are declared and laid on the table. In general melds score 1 point per card. The exceptions are the Penchants (1 point for two cards), Quadruplets (10 points), and Reunions (25 points).

Brisques are scored at the end of hand. Brisquettes won during Phase 2 earn 1 point apiece. The player with most total Brisques across the whole hand (Phases 1 and 2 combined) scores a *Book Bonus* of 1 point for every Brisque won in excess of six. There are twelve Brisques in the deck. If both players win six, neither scores the Bonus.

So for instance, a player who won ten of the twelve Brisques, eight of those in Phase 2 would earn 8 points in Brisquettes plus a 4 point book bonus (i.e., 10-6).

Note that Brisques won in the last six tricks potentially count twice: once when won, and again at the end as part of the bonus. For that matter, they could have been scored previously as melds.

A game is four hands. The final score for the game is the higher score minus the lower. If the lower-scoring player fails to make 40 points during the four hands, this player is *lurched* and the game score is doubled from its usual.

Barring

Pairs, Triplets and Quadruplets are divided into two classes, Major and Minor. The Major sets are formed of court cards (Jacks, Queens, Kings) and Aces; the Minor sets are formed of cards below the Jack. The highest Major set in either tableau at any moment controls the *bar*: The highest Major Pair in either tableau bars the opponent melding any Minor Pairs; the highest Major Triplet in either tableau bars the opponent melding any Minor Triplets or Pairs; and the highest Major Quadruplet bars all Minor sets. The barring player does not have to have declared the barring set as such: it merely has to be found amongst her melded cards. However a Minor set that is longer (more cards) than the

barring set can still be melded even if it does not bar anything itself. To unbar you only have to tie the rank of highest Major set, not beat it. And only Minor sets can be barred, never sequences or couplings.

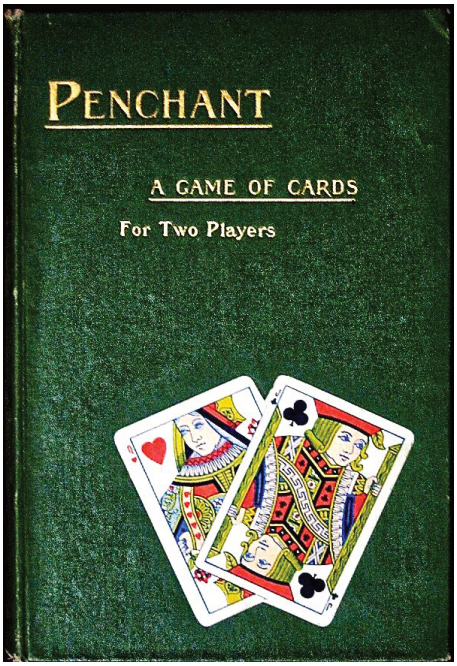
For instance, if your adversary has two Queens on the table, you cannot announce any Pair below Jacks. Her Queens need not have been announced as a Pair; they may be parts of, say, a Marriage and a Penchant. But if you have on the table a Pair as good as hers (say a pair of Queens, or pair or trio of Kings), you can meld Minor Pairs.

For another example, suppose she has two Kings on the table, and you have two Aces. Your Aces cancel her Kings, and you can score any Minor Pair; but she cannot. If you have a Minor Triplet to declare, such as three 8's, no Major Pair of hers will bar it, because your Triplet is longer than her Pair. In addition, no Minor set on her side will bar you; it must be a Triplet of court cards or Aces, and it must be better than any Triplet among the cards you have laid on the table yourself.

Modern Scoring—Tailoring the Game to Your Tastes

Having played many hands, I recommend players shave off some of the extremes of melding: utilizing 8 points for a Quadruplet, and 20 points for a Reunion. This is in part based on the fact that a Reunion will occur 2.5 times as often over sixteen hands as a Quadruplet. An easy way to remember this is that melds are worth 1 point per card, except Quadruplets are 2 points per card and Reunions 4.

One advantage of the "many paths to victory" structure of Penchant is that the scoring is easily tinkered with and tailored to suit one's preferences. For instance, when I play I usually double the Brisque scorings (i.e., 2 points per Brisquette and 2 points per total Brisques over six) while leaving the meld scores largely intact. Effectively, I halve the meld score. I do this because I find melding more dependent on luck than capturing Brisques and this balances the three scoring paths (melding, end-game Brisquettes, and Brisque Bonus) for a tighter more strategic game. Others may prefer to double only the Brisque Bonus to 2 while leaving Brisquettes at 1 and melds as they are (if they find building a hand for Phase 2 less interesting). And of course, nothing stops one playing by McTear's original.



Cover of John McTear's book

Thoughts on Tactics

There is a flow to Penchant that feels contemporary. Every turn you need to decide how to use your cards: to win tricks here and now to meld or collect Brisques for the book bonus, or to build a hand for the short but important Phase 2; you may decide to score and "bank" cards via melds or go specifically for the all or nothing Reunion. Each road can make sense depending on context. The fact you do not score Brisques in Phase I until you make six in total demands a commitment—since you will score nothing if you capture fewer than seven. At the same time, sometimes it makes sense to try to get ahead purely by building up a melding-engine. Preparing for the short but explosive end game is a path in itself, and you can win just on Brisquettes.

The tight slow tension of Penchant has been described as "walking on a knife." It feels closer to a modern Eurogame or abstract. And this is so different from the extravaganza of Bezique, where there are up to six copies of every scoring card, and points accumulate like a slot machine.

Penchant is a game of constant agonizing choices and time pressure: with only six cards at play one is always choosing between tricks and melds, current, and potential. You must not only think of immediate points when melding, but also build a hand to win Brisquettes in Phase 2, worth a lot of points. Ten tricks of play in Phase 1 does not allow much time for implementation. You must also decide between playing and thereby revealing, or holding and thereby hiding, key cards needed by the opponent. When to set trump is another difficult choice; if you wait too long your opponent will act. The "all or nothing" book bonus creates a constant pressure to reach seven Brisques, or prevent your opponent from doing so. Then there is barring strategy and tactics. A particularly unique challenge of Penchant is how to win Tens (middle ranked) and 7's (the lowest).

The order of melding takes some thought: Minor sets are easier to score at the beginning before they are barred, especially 8's and 9's that may only be used otherwise in the rare five-card Flush. All things being equal, you should first meld cards you intend on using early in tricks.

As in Pinochle, combinations should be built up slowly, since they score cumulative points. For example, with the modern scoring, a Quadruplet is potentially worth 13 points if drawn out (2+3+8); a Reunion potentially 29 (2+3+4+20). But of course the Quadruplet may be blocked at any point and you need to finish within ten tricks.

The two high-scoring "standout" meld combinations are crucial to monitor: Reunions and Quadruplets. The probability of being able to obtain a full Reunion across Phase 1 is about 1 in 10; the probability of a Quadruplet across Phase 1 is about 1 in 4. Keep a checklist of the potential Quadruplets and Reunions your opponent might hold based on known cards.

Going for the Reunion is a challenging gambit. You basically have to sacrifice winning the Bonus and Brisquette points for a huge pay off. One needs to start early with the J-Q-K plus some others to make this gambit worthwhile. Even with luck on your side you have to make sure you hide your intentions, keeping as many of its cards unexposed as possible. The Quadruplet is much easier to obtain (2.5 times as likely), but still has a nice bonus.

Think carefully about playing a trick from your melds if it removes a bar on your opponent. Typical of this game, the tradeoff is sometimes worth it.

Take careful note of the stock, as any melding strategy needs to finish by the time it is exhausted, and it is easy to be caught off guard.

Take careful note of cards played in tricks that could have turned your Besitos and Marriages into larger runs, so you can abandon those plans and avoid fishing for cards in vain. Likewise, conceal in hand as long as possible cards that would

create runs for your opponent.

Jacks are especially pivotal, for without them Marriages and Sets cannot turn into runs. And of course they are the only cards which can set trump.

J-Q-K forms the basis for many melds. This combination also allows domination of tricks in the end game if it is extended upwards. Be careful of letting the opponent sweep a run in the end game by playing a suit you do not possess.

The Flush is the only meld that allows you a couple of low-card kickers, so it is a good way to get rid of 8's and 9's, while scoring 5 points at the same time.

Looking at different rank's versatility in scoring different combinations, the cards go from the Queen (usable in every combination), to the 9, 8, and 7 (usable only in Sets and the Flush). The Jack is the second most versatile card, as it can be used also in Besitos and Penchants. Kings come next, because of their role in the Marriage, then the Ace and Ten, and lastly, as mentioned 9, 8, and 7.

Winning last trick in Phase 1 is very important, since the winner leads in Phase 2, where every Brisquette is worth a clean point (and even more so if using modernized scoring). At what point in the hand one decides to shift focus to prepping for Phase 2 is one of the key tensions of the game.

Aces are most valuable, since they are simultaneously trick winners, Brisques, and barring cards. Melding aces is usually best, since they can be "stored" for future tricks, or saved even longer to control the end game, while barring the whole time—but melding also reveals you have them.
Keeping Aces for Phase 2 can generate huge points, even if you sacrifice some earlier tricks.

The Penchant's main value is not as a scorer but in setting trump and should be used selectively. There is less value in setting trump before you know both hands for the end-game; however, wait too long and your opponent will set it for you. You could also set trump early and then build your strong suit for the end-game. The Jack in your opponent's strong suit is obviously a strong card to hold to prevent her making trump.

Set trump when you have preponderance in a suit, are scoring badly, when it might help with declarations, and if the opponent will likely make trump in an unfavourable suit.

Winning 7's—the lowest rank—takes particular skill. You can still "make book" without them, so one strategy is to win everything else. You can alternatively win 7's by exhausting your opponent's remaining cards in the suit. Melding 7's early allows you to win them opportunistically in tricks; but leaving them on the table too long risks having to play them in the end game, where they usually count against you twice. One common tactic is to "sacrifice" a 7 in Phase 1, so it will not haunt you even more in Phase 2.

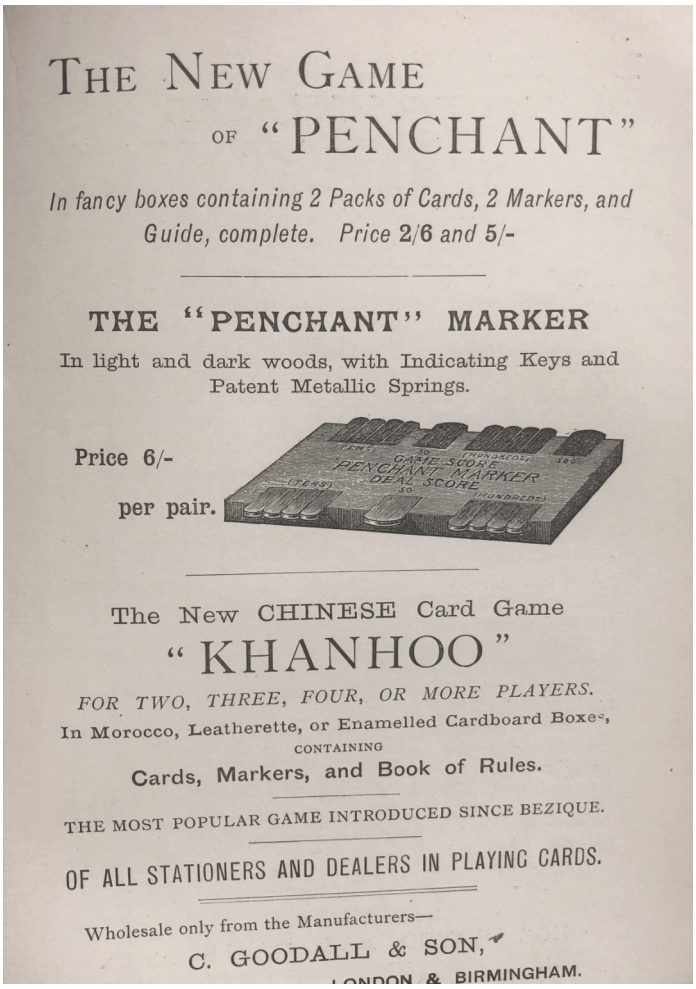
It should be noted that most of the bread-and-butter trick tactics of other games (stoppers, squeeze plays, guarding, finesse, etc.) also apply to Penchant.

Conclusion

So there it is, Penchant, a lost Victorian classic from the Bezique family. Experienced Bezique players will find themselves immediately at home in this sharp variation of their beloved game. New players, unfamiliar with Bezique and its various incarnations, may need a bit of work to become conversant with Penchant. Nevertheless, the effort will be worth it, opening up the whole vista of this skillful and historical family of card games. ■

♥♠♦♣

The original Penchant scoring was actually ten times the values given by the author in the article above. If you do multiply the above scores by ten, either for the original scoring or for the modern scoring proposed by Jonathan Kandell, you can use traditional Bezique markers to record the scores during the play of the game. On the bottom left of the table in the header image you can just discern a traditional Bezique marker in use, of the same type as those depicted in the images below. ~ Ed.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Penchant cheat sheet

Designer: John S McTear aka Jack Smarte, 1837.
Deck: 32 cards, **A-7 in four suits. A high K, Q, J, 10, 9, 8, 7 low**. (Different than rest of marriage family.)
Win: More points over four hands. Points are from **Melds** and for "**Brisques**" (7,10s, As) won in tricks across game.

Trick Following Rules:
Phase 1: **ftr** any card may follow, don't have to win trick
Phase 2: **F,T,r** must follow suit, if unable must trump, must win trick if able.

PLAY:

Phase 1: **Trick-and-draw,**

1. **6 cards to each player**
2. **Non-dealer leads** trick, trick winner leads next trick**. ftr**. Deal alternates.
3. Card for trick may come **from hand or from previously melded** on table interchangeably.
4. Won **Brisques sifted out** and placed **face down**, spread so may tally. (Other cards put to side in discard piles.)
5. Winning a trick allows winner option to **meld** one combination:
   a. Combinations are laid face up in a single row each. Scored immediately.
   b. Cards for combinations may re-use cards from previous melds as long as 1+ new card added from hand
   c. Suit of Jack in trick **winner's first Penchant sets trump** for rest of hand.
   d. Penchant (only) may be melded by trick-loser if winner doesn't meld; but doesn't set trump.
6. Winner of trick picks card into hand from stock, then loser of trick.

Blocking Melds: The highest Major Pair (J through A) in both tableaus blocks opponent's melding Minor Pairs (7-10); highest Major Triplet blocks Minor Triplets and Pairs; highest Major Quadruplet blocks all Minor sets. Unblock requires a higher count Minor set or higher ranked Major set. Couplings and runs never blocked. Major sets never blocked.

Phase 2: starts moment last card of stock is drawn:

- Melds drawn back into hands (back to 6 cards each)
- Winner of last trick phase I leads first trick of Phase 2.
- Trick rules change to strict: **F,T,r** : must follow suit, if unable must trump, must win trick if able.
- All tricks left face up exposed.
- No melding.

MELDS		
Name	*Description*	Points
Sets		
Pair	Two of a kind	2
Triplet	Three of a kind	3
Quadruplet	Four of a kind	10
Runs of Same Suit		
Family	Three card sequence, must include JQK	3
Clan	Four card sequence, must include JQK	4
Extended Family	Five card of same suit, must include JQK	5
Reunion	Five cards in sequence of same suit, must include JQK	25
Couplings		
Marriage	K and Q of same suit	2
Besito	Q and J of same suit	2
Penchant	Q and J of different suits	1

SCORING

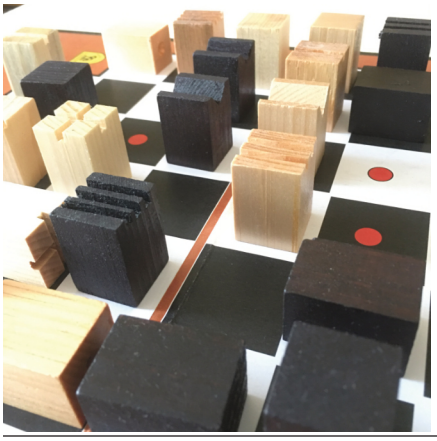
Melds are scored as they are declared.

At end of hand:

*For each **Brisquette** won in Phase 2, 1 pt each.*

Brisque Bonus: *Player with majority of total brisques, subtracts six from total and scores 1 pts each.*

McTear's original scoring is shown. Modern scoring uses Quadruplet 8, Reunion 20, and the Brisquettes and Brisque Bonus are 2 points each rather than 1.



Three Solitaire Abstract Games

by Karen Deal Robinson

Introduction

This article will explore three somewhat similar games: Maze and Diplomatic Mission, both designed by Jim Deacove, and Safe Passage, designed by myself. All three can be played either cooperatively by two players, or solo, with a single player alternating sides. All three are rather Chess-like abstract games in which the object is to have a few pieces exchange positions across the board. The path is restricted in some way, making the movement of the target pieces a challenge.

In Maze, the restriction is mostly due to the sheer number of pieces crowding the board. There are also certain squares on the board that further restrict movement. The board in Diplomatic Mission is also crowded, but less so. However, the movement of the pieces is restricted by the fact that certain pieces of one colour cannot be adjacent to pieces of the other colour.

Both games have the interesting property that players can move pieces of either colour, but only on their side of the board, or in the case of Diplomatic Mission, also in a neutral central territory. This further restricts options for movement.

The third game, Safe Passage, is played with a Chess set. The restriction in movement comes from the fact that no non-Pawn piece may ever be placed *en prise*, that is, in a position where it could be captured on the next turn.

As a solo player who loves abstract games, I am always looking for solo abstracts. They are not easy to find. There are of course many puzzles of various sorts, but these games, because of the random position of the pieces at the beginning, have a lot of replayability and feel more like actual games.

Maze and Diplomatic Mission are available from Family Pastimes Cooperative Games. Safe Passage is playable with any standard Western Chess set.

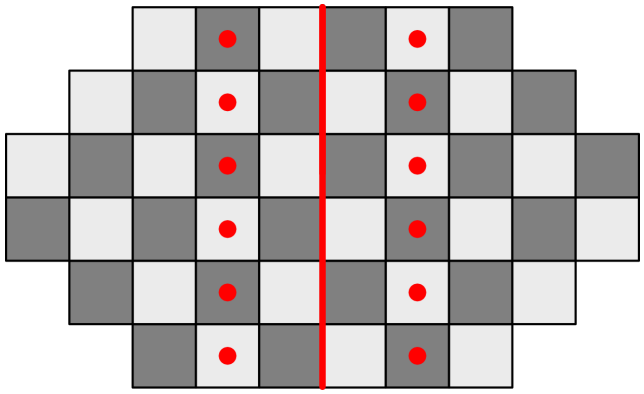
Maze

Maze was developed in 1982 by Jim Deacove. Family Pastimes Cooperative, the brainchild of Jim Deacove, is dedicated to board games that are played cooperatively rather than competitively. Their early games looked like they were made in someone's garage, and the game boxes looked like the kind of mailing box you would buy at an office-supply store. Later they became more polished, but Maze is a charming example of the rustic look. The pieces look like sections of dowels and rectangular sticks, and the various types are distinguished by different kinds of cuts made into their top surfaces. Like chess pieces, the different pieces move in different ways.

The box includes a pad of paper to record games, and a sample game to study. Jim Deacove writes in the rules that if people send in their games with an analysis of the moves, he might publish a booklet of sample games, but to my knowledge that never happened.

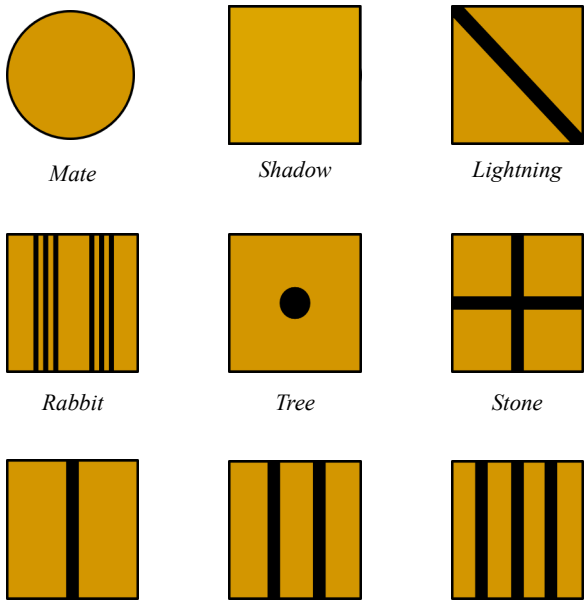
Rules

The board is a checkered oblong, as shown in the diagram below. The squares marked with red dots on the board represent "desert" spaces. The red line divides the board into two halves.

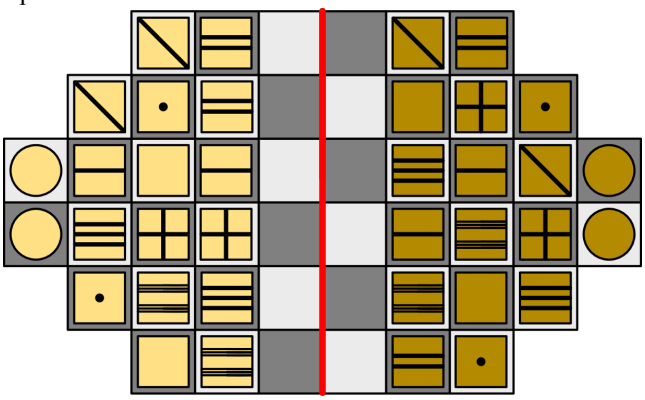


Maze board

Below are the pieces. There are two of each, in a light-coloured set and a dark-coloured set.



The two light Mates are placed in the pair of squares at one end of the board (the *home squares*). Randomly place the rest of the light pieces in the 16 squares in front of them. Do the same for the dark pieces. The two sides will very probably not have the same arrangement. If you turn the pieces upside down, they all look the same, so you can scramble them upside down before placing them, to get them really randomized. Here is a sample setup:



Sample Maze setup

The two players are working cooperatively, but they take turns. On your turn, you can move pieces of either colour, but they must begin their move on your half of the board. You cannot move pieces that are in the opposing territory. It is not spelled out in the rules, but for this to work, you would have to be able to move a piece onto the other side of the board, but it must start on your own side.

You may want to have a token you can slide to the other player to keep track of whose turn it is. This is especially helpful if you are playing solo, playing both sides. The two sides must alternate; if one side cannot move, the game is lost.

The goal is to get the light Mates into the home squares of the dark Mates, and the dark Mates into the home squares of the light Mates. No piece ever captures any other piece; no piece is ever removed from the board.

Some of the pieces will start on the desert squares, marked with a dot. Those pieces can move away from their starting squares. But once a piece has moved, if it lands in a desert square, it dies. It is turned sideways and cannot move for the rest of the game.

Each colour has two of each type of piece, and here is how they move:

Mate: Moves any number of spaces diagonally, like a Chess Bishop. Once it reaches the opposite Home Square it may not move again. (Other pieces may move in and out of the Home squares.)

Shadow: Moves to any space adjacent (orthogonally or diagonally) to a Mate of its own colour.

Lightning: Moves one space diagonally.

Rabbit: Jumps over another piece of either colour. It moves orthogonally or diagonally, but cannot move without jumping another piece.

Tree: Moves to any unoccupied space on its side of the board. Once it moves, it is planted and never moves again. Turn it sideways to show it has been planted.

Stone: Moves one space forward or back and then one space left or right. The move is effectively one space diagonally, like the Lightning, except that both spaces must be unoccupied.

Time Pawns: Move orthogonally forward or sideways, never diagonally or backward. They are limited in the distance they travel. Pawn 1 only moves one square; Pawn 2 moves exactly two squares; Pawn 3 moves exactly three squares.

Comments

I find this really challenging. Between the crowded field and the "dead" pieces that cannot move, things can get blocked pretty quickly.

Jim Deacove suggests an easier game for children and beginners, where you only place 10 pieces of each colour in the two rows in front of the Home Squares, and set the rest aside. I find this more enjoyable, but a better player will probably find that variant too easy.

This game feels like a real classic, and deserves to be better known.

Diplomatic Mission opening setup

Diplomatic Mission

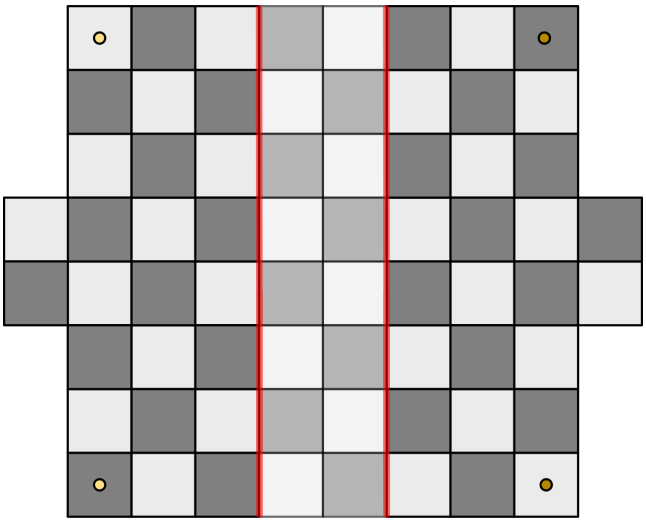
Diplomatic Mission was developed by Jim Deacove in 2002, some time after Maze. In some ways this game is similar to Maze, but it has some added complexities. It seems to have been more similar to Maze in the 2002 edition of the rules, but it was updated for the 2007 edition, which I have. On the website and on the box is a photo of the game which shows cards with diagrams of how the pieces move. They seem very similar to the moves of the Maze pieces. However, the rules I received have cards with very different moves.

I was curious whether the other complexities were part of the 2002 edition, or whether they also were changed. I wrote to Jim Deacove, and he was very cordial, but said he could not find the original rules and did not remember what they were. So this description will reflect the 2007 edition. However, Jim did help to clarify the rules of the 2007 edition.

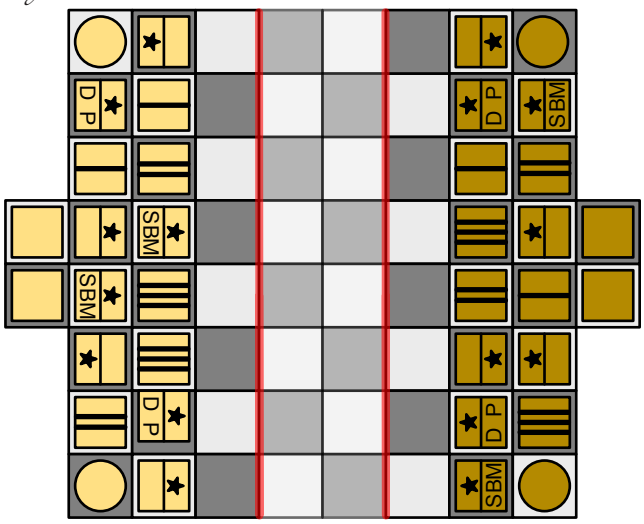
The diagrams of board and pieces will be stylized for this description. The original board and pieces are very colourful, with images of animals for the pieces.

Rules

The board is an 8x8 checkered board with two "castle" squares at each end. The board is divided into three regions: the white army territory, the black army territory, and the middle two ranks that form the neutral territory. It is very attractive; the squares look like pieces of a map. The pieces are nice solid wooden disks that come with stickers of animal heads that look almost photographic. There are 18 white pieces and 18 black pieces. Each side has two of each kind of piece. The set is stunningly beautiful, and looks more polished and sophisticated than the rustic components of Maze, including the box.

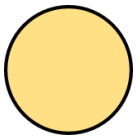


Diplomatic Mission board

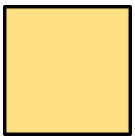


Sample Diplomatic Mission setup

Below are the stylized pieces, which I have made to match as closely as possible the Maze pieces, some of which are shared by Diplomatic Mission.

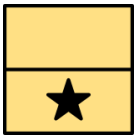


Scout (Fox)

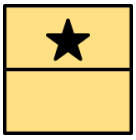


Diplomat (Wolf)

Peacemaker (Dove)

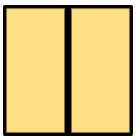


Politician (Lizard)

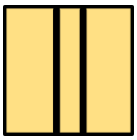


Journalist (Rabbit)

Bodyguard (Gorilla)



Military 1 (one Hawk)



Military 2 (two Hawks)

Military 3 (three Hawks)

The two Diplomats on each side are placed in the two castles. The two Scouts must be in the corner spaces. The other pieces are placed randomly in the two rows in front of the castles (you could turn them face down and scramble them, and then place them and then turn them face up.) The Scout on the left side only works with the Diplomat on the left side, and the Scout on the right side only works with the Diplomat on the right side, and you are supposed to mark one set so you can tell the difference. At first glance, it may seem unnecessary to do this, particularly as the set comes unmarked in this way. However, according to the designer, if you do not match a Scout to a Diplomat, one Scout becomes irrelevant, and each Diplomat having a personal Scout adds some complexity.

"You start thinking: it can't be a great cosmic game of chess, it has to be just very complicated Solitaire." ~ Crowley from *Good Omens* (Gollancz, 1990) by Terry Pratchett and Neil Gaiman.

As mentioned above, we had to ask Jim for clarification on several points. For example, he confirmed that the word "adjacent" means adjacent orthogonally, *not* diagonally.

The two players are working cooperatively, but they take turns. On your turn, you can move pieces of either colour, but they must begin either in your territory or the neutral territory. You cannot move pieces that are in the opposing territory. It is not clear in the rules whether you can move a piece into the opposing territory. Based on the game's similarity to Maze, I would guess that you can, as long as it begins in your territory or in the neutral territory.

On your turn, you must make exactly three moves, and one of them must always be to move a Scout. The Scout move can be either the first, second, or third move. There are three tokens used to keep track of this, with the red token representing the Scout move, and the two yellow tokens representing the other moves. When you make a move, slide the token over to the other player. The tokens look like toy plastic thimbles. I usually replace them with glass stones in keeping with the beauty of the other components. As in Maze, no piece is removed from the board. It is possible, however, for pieces to be killed, which will be explained below.

The goal is to get the white Diplomats into the castles in the black territory, and the black Diplomats into the castles in the white territory, without any casualties (or in an easier variant, with no more than three casualties).

Any time a Scout, Bodyguard, or Military piece is adjacent to a piece of the other colour, the other piece is killed and the mission fails. (In the easier variant, there can be three casualties total before the mission fails.) If two "killer" pieces of opposite colours are next to each other, the one that moved to the adjacent square is the one that kills the other piece. In the easier variant, the casualty is turned face down and does not move for the rest of the game.

Sometimes some of the pieces will be stacked on top of each other. Jim clarified the rules about stacking. There is no limit to how many pieces can be stacked. New pieces added to a stack must be placed on the very top or bottom, not the middle of a stack. However, only the top piece of a stack can move. This is the case also for the Politicians (see below) that are stacked *underneath* pieces—only the top piece can move. If there is a casualty, the top piece is turned face down, counting as one casualty, but the entire stack is stuck there for the rest of the game.

Each colour has two pieces of each type, and this is how they move:

Scout (Fox): Moves any number of spaces, orthogonally or diagonally, like a Chess Queen.
Military (Hawks): Moves like a Chess Queen, but with limited distance they travel. Military 1 only moves one square; Military 2 moves exactly 2 squares; Military 3 moves exactly 3 squares.
Diplomat (Wolf): Moves to any space adjacent to its own Scout.

The other pieces do not really move by themselves. They can be placed on top of other pieces of their own colour, or under other pieces of their own colour, depending on the type of piece. Pieces can flit from the top of one stack to another. Pieces do not have to be adjacent to one another to stack one on top of the other, and a piece can move to any piece it can stack with, wherever on the board.

Bodyguard (Gorilla): Stacks on top of Diplomats and Politicians of its own colour.
Peacemaker (Dove): Stacks on the top of Scouts, Bodyguards, and Military of its own colour (the killer pieces).
Journalist (Rabbit): Stacks on top of any piece of its own colour.
Politician (Lizard): Stacks under any piece of its own colour.

Variants

The first variant is the one where the players are allowed a total of three casualties, as described above. A casualty is turned upside down and does not move for the rest of the game.

The second variant is called the "Citizens Variation." In this variant, the Politicians, Peacemakers, and Journalists are turned face down and are called "Citizens." The Citizens can stack on top of any piece of their own colour. The Bodyguards can also stack on top of any pieces of their own colour. Reading between the lines in the rules, I get the feeling this may have been an intermediate design step between the 2002 and 2007 rules.

Comments

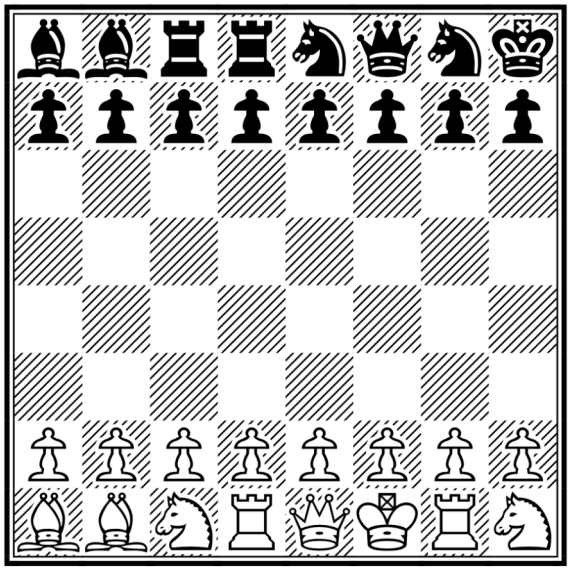
Diplomatic Mission feels very byzantine to me for an abstract game, but that may just be because the three-moves-per-turn and the stacking mechanism feel so unfamiliar.

I was not entirely sure what the rule about having to move the Scout each turn contributed to the game. Since the only way to move the Diplomat (in the 2007 rules) is to place it beside the Scout, of course you are going to want to move the Scout across the board at some point. According to the designer, "Having to use one of the three moves to play a Scout tightens the scope so the main thrust of the game, which is to get Scouts in place on the other side of the board, is still the uppermost strategy."

I experimented with the 2007 rules, leaving out the three-move per turn rule. It did not seem to make much difference in the gameplay. But I am not very skilled, so maybe there is an advantage to doing three moves at a time that I am missing. If you are playing cooperatively, it may allow you to do a combination with the stacking before the other player moves.

I am still trying to figure out how to use the stacking effectively. Some of it makes sense to me. Placing a non-killer piece on top of a killer piece temporarily neutralizes it, allowing pieces of the opposite colour to safely pass by. And stacking a Bodyguard, which is a killer piece, onto a Diplomat, which can have previously moved, allows it to move out of the way.

I haven't quite grokked this game yet. A lot of times I find myself staring at it wondering what to do. But I still get it out fairly often. I guess I like the challenge of trying to figure out how it works. My gut feeling is that Jim Deacove started with Maze, which is a pretty great game, and fiddled with it a little too much trying to give it a theme. I'm still in love with the way it looks.



Example of Safe Passage setup

Safe Passage

Safe Passage is a game that I completed in 2019. This fairly recent game actually has a two-decade history dating back to 1998, and a not-very-good parent game with the awkward name of Chess Contradanse. (The game was named by Hans Bodlaender, the administrator of the Chess Variants website, to tie in with another game of mine called Queen's Quadrille.)

My original inspiration was a puzzle from the video game The 7th Guest. My children described it to me as played on a four-by-something Chess board with four Bishops at each end. The goal was for the black Bishops and white Bishops to change places without ever being put *en prise* (that is, in a position where they could be captured). The turns did not have to alternate colours. I never did solve the puzzle, but I didn't really work at it, since at the time my kids couldn't remember how long the board was. I later found out it was 4x5.

The old Chess Contradanse game was played on a regular Chess board, with the white non-Pawn pieces being arranged at random on the first rank, and the black non-Pawn pieces being arranged at random on the eighth rank, making sure that the two Bishops on each side were on opposite-coloured squares. The Pawns were not used at all in this early version. Pieces in the first and eighth rank were immune from capture. The goal was to move all the white pieces to the eighth rank and the black pieces to the first rank, using normal Chess moves. Pieces in any rank except the first and eighth were not allowed to be put *en prise*.

It was a tedious and not-very-satisfying game. I could generally bring it to completion if I stuck it out long enough. But I wanted a better game.

In about 2008 I discovered the wonderful *Chess Mazes* books by Bruce Alberston, and that whetted my appetite to improve my game, but it took a long time to do so. The books present several puzzles, in which a board position is shown. There are several black pieces and one or possibly two or three white pieces. The black pieces never move. The solo player has to navigate the white piece (or pieces) so that it is never *en prise*, and get the black King in check. In some of the later puzzles, the player has to give checkmate.

It must have been about 2018 when I got my copy of Jim Deacove's Maze game, and that gave me the clue I needed for my game. As he focused on getting the Mates to change sides, I would focus on getting the Kings to change sides. I would put the Pawns back in the game, crowding the board a bit more, as the

pieces in Maze were crowded. With the Pawns there, I did not have to make an exception for the first and eighth ranks, since the Pawns could protect the other pieces. It was feeling more like a real Chess game. I decided to call the game Safe Passage, because the goal was to get the Kings safely across the board.

Rules

The set up for the basic game is exactly the same as the set up for standard Western Chess. To give it some variety and make it more than just a puzzle, you can randomize the placement of the non-Pawn pieces, the white pieces on the first rank and the black pieces on the eighth rank. Just be sure the two Bishops are on opposite-coloured squares (as in Chess960).

The pieces and their movements are exactly the same as in standard Chess, with the exception that there is no *en passant* capture. There is also no promotion. Castling is still allowed.

Pawns may be put *en prise*, and may in fact be captured, though there is no obligation to do so. No other piece may be put *en prise* at any time. If at any time you notice that a non-Pawn piece is *en prise*, you have lost the game, unless you can immediately backtrack and undo the move that put it in danger.

The two colours alternate moves. If you are playing solo, you may want to use a token to keep track of which side is moving.

The goal is to safely bring the white King to the original position of the black King, and vice versa.

Comments

I intended Safe Passage to be a solo game, but it could also be played cooperatively with two players.

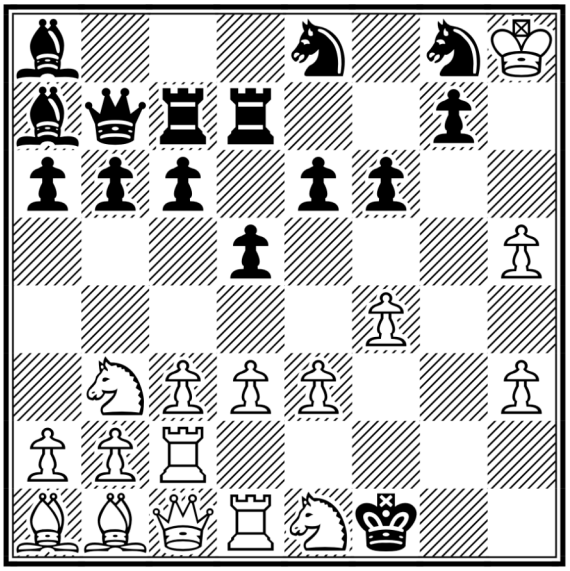
The requirement that the two colours alternate moves sometimes leads to some meaningless jockeying on one side or the other. You may want to incorporate a house rule that occasionally allows you to skip a turn, if that turn is not doing anything useful. However, if you are the kind of competitive person who wants to solve a puzzle in as few moves as possible and tell people about your results, do not skip any turns. It is possible these extraneous moves only occur because I am not a very good player.

When I first posted this on a forum at BoardGameGeek, someone reported that he had solved the basic game in 34 moves and wondered if a faster solution was possible. I was a little bemused. I did not intend this to be a puzzle you solved once and then were done with, though he apparently enjoyed the experience. He thought it would be fun to try to beat his previous time, and played several games to get it that low. If you enjoy "beat your own score" games, this might appeal to you.

For myself, even playing the basic game with the standard set up, I like to experiment with different openings and see how it unfolds. Maybe if I were a better Chess player that wouldn't be as much fun, I do not know. But I hope that by incorporating the random set up positions, I have added enough variety to make it into a real game, and not just a puzzle to be solved once.

Conclusion

When I started a geeklist at BoardGameGeek to look for solo abstract strategy games, I started with these three, plus another game of mine (Temple Island Chess) that is not really a chess variant, though it is played with Chess pieces. Other people added games that involved tiling with polyominoes, or games reminiscent of Peg Solitaire. There are even a couple of open-information games with cards. But these three have, at least for me, that feeling you get when you are bending over a Chess board, thinking about how the different pieces move, and planning what to do next.



A won game of Safe Passage, from the starting position above

In the final position, depicted above, you will note that only one black Pawn has been captured. This is normal, as the Pawns act as barriers for the movement of the ranging pieces. Note also the powerful pieces are bundled off to one side out of the way, which also is normal.

The official rules for Maze, as given here, lead to a very challenging game. A key factor that can snarl up the movement of pieces in Maze is that Lightning, Rabbit, Stone, and Time Pawn 2 are all restricted to one colour square, and can only reach half the squares of the board. An imbalance at the start, with too many of these pieces on the same colour, will undoubtedly result in a game that is impossible to solve. I recommend distributing these equally to dark squares and light squares in a semi-random setup. Thus, take one piece each of the Lightning, Rabbit, Stone, and Time Pawn 2. Take four more pieces randomly chosen from among the remaining Shadows, Trees, Time Pawn 1's, and Time Pawn 3's. Distribute these eight pieces randomly on the white squares, and then distribute the remaining eight pieces randomly on the dark squares. Use the same setup procedure for both light and dark pieces. This process ought to give a more balanced game, which will be much easier to solve. It is no different to making sure the Bishops of each side in Chess960 are on opposite colours. The image on page 1 shows a setup made according to this system, which is winnable.

There is much to discover in Maze. In the opening you try to extract the Mates from their initial positions one or two spaces, and then place the Shadows behind them to open up space ahead. Try to free up a few squares one side of the board, away from the main thoroughfare, to bury Trees and open up more space. Note that the Lightning and Stone cannot cross the desert spaces without dying; note also that the same may be true of the Time Pawn 2 and Rabbit, depending on their initial placement. Pieces that cannot cross the desert need special care, as their options are more limited.

*Author of the article, Karen Deal Robinson, is a retired mathematics teacher who sometimes dabbles in amateur game design. Her games include Solitary Journey, Safe Passage, Temple Island Chess, Wizard's Tower (*AG21*), Solitaire Gin Rummy, and Queen's Quadrille. She has been interested in solo board gaming since about 1964, when nobody would play Candyland with her so she wandered down that magical path all alone. A few of her solo games, the last three listed above, were published in Games magazine in 1998.*

Maze and Diplomatic Mission are both published by Family Pastimes Cooperative Games. Amazingly, Jim Deacove, the designer of the games, and his wife Ruth have been operating Family Pastimes since 1971, an incredible half a century. Their large collection of original games are all cooperative, or effectively solitaire games. Other games in the line, particularly Yin Yang and Warp 'n Woof, also look interesting, though I have yet to try them. Family Pastimes was far ahead of its time in the development of solo and cooperative games. Jim and Ruth are retiring at the end of 2021. I do not know whether any of their games will remain available thereafter or what will happen to their company and its stock. You should at least snap up a Maze set while you can, and take a good look at some of their other games! ~ Ed.

Acknowledgements
Family Pastimes Cooperative Games: https://familypastimes.com/
SuperDuperGames: http://superdupergames.org/main.html?page=about
Mirador on BoardGameGeek: http://superdupergames.org/main.html?page=about
Description of Mirador by Andrew Perkis: http://superdupergames.org/rules/mirador.pdf
Record of annotated game: http://superdupergames.org/main.html?page=archive_play&gid=30664
Record of game with four-move win: http://superdupergames.org?page=archive_play&gid=34053&idx=7

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Accasta 21
Agon 17*
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Alfred's Wyke 21*
Alice Chess 8*, 9, 11
Amazons 16*
Anchor 5*
Arimaa 16*, 22
Assembly Line 15*
Avalam Bitaka 18*
Azul 18
Bantu 15
Bao 4†, 5†, 7†
Bashne 1*, 3, 7, 9, 11, 15, 16
Bhargage 19*
Bin'Fa 14
Blink 8
Blokus 16
Blooms 20*
Boom & Zoom 21*
Bosworth 2
BoxOff 19*
Breakthrough 7*
Bridget 22
Byte 22*
Camelot 1, 7*, 8, 10, 14
Capitalist Sprouts 16*
Carnac 19*
Cathedral 3
Chameleons 22*
Chase 9*
Chebache 3
Chessboard Jetan †
Chivalry 6*
Chu Shogi 4, 6, 7, 8, 18
Cityscape 15
Colors 3*
Congklak 2*
Congo (ca.1900) 8*
Croda 9*, 10
Cross 6*
Cross Over 14
Cubeo 22*
Dag en Nacht 22*
Dagger Go 13*
Dameo 10*, 11, 19*
Dao 6
Defiance and Domain 10†, 11†
Deflection 6
Diffusion 22*
Diplomatic Mission 22*
Dodo 22*
Domain 12*, 13
Dvonn 8
Ecila Chess 12*
Eight Sided Hex 5*
Emergo 13*
Entrapment 22
Entropy 11*
Epaminondas 3*
EVL 22*
Exchequer 15*
Fenix 20*
Feudal 11
Fire and Ice 15
Flume 22*
Fox and Geese 8*
Fractal 22*
Frames 14*Freeze 7*
Friends and Foes 16
Frisian Checkers 10*
Gaudi 13
Gipf 1
Gle'x 11*
Gnostica 13
Go 15
Gobblet 8
Gonnect 6*
Grand Chess 3*, 4-15
GRYB 10
Guard and Towers 13
Gygès 7
Hackaback 11†, 12†
Halma 9, 15*
Havannah 12*, 14, 15, 16
Head Start Hex 5*
Heaven and Hell Chess 8*
Hex 2*, 3, 4, 8, 10
Hex Kyoto Shogi 5*
Hexagonal Chess 7
HexDame 8*
HexEmergo 13*
HexGo 6*
HexGonnect 13*
Hi-Jack 14*
Hijara 5
Hive 10, 17, 20
Hostage Chess 4*, 5, 7
Hox 21*
Indochine 8
International heckers 7*, 9
Jade 22*
Janggi 12*, 15
Jed 22*
Jersi 21*
Jetan 6*, 7, 8, 14, 19* 21
Katarenga 17*
Keil 18*
Kimbo 5, 6
King of Pearls 14*
Knight Line 20*
Knockabout 12
Kogbetliantz' 3D Chess 11*
Konane 12*
Kyoto Shogi 1*, 2, 3, 4, 11
Labyrinth 19*
Lanza 14*
Lasca 11*
Latrunculi 7*
Layli Goobalay 13*
Ley Lines 17*
Lightning 5*
Lines of Action 1*, 2, 3, 5, 6, 7, 9
Liubo 15*
Lord of the Rings 16
Lyngk 18
Magneton 7*
Mahjong 10
Mamba 12, 16*
Marrakesh 18*
Martian Chess 13, 14
Mattock 21*
Maze 22*
Mem 2*, 17
Mentalis 1*
Military Game, The 11*
Millennium 3D Chess 14*
Miller's Thumb 9*
Mirador 22*
Missile Match 15*
Monkey Queen 22*
Mozaic 8*, 9
Murus Gallicus 20*
Myrmex 21*
Nana Shogi 5*
Nardeshir 14*
Neue Dame 18*
Nibelungenlied 14*
Nine Men's Morris 13*
Ninuki Renju 12
NXS 20
Octagons 7*
Octi 2
Octiles 15
Omega Chess 8
Omweso 11*
Onyx 4*, 6, 11, 17
Orbit 12*
Ot-tjin 14*
Othello 9*
Oust 22*
Pagoda/Pagode 13*, 15, 20, 21
Patricia 5*
Penchant 22*
Pentagons 2
Pente 12*
Phalanx 11†, 12†
Phutball 3*
Plateau 3
Ploy 6
Ponte del Diavolo 21*
Poppy Shogi 4*
Por'rika 10*
Praetorian 12*
Prism 16*
Progressive Go 13*
Progressive HexGo 13*
Proteus 9
Push Fight 18, 19*
Qua 19*
Quadlevel 3D Chess 17*
Quandary 13
Quintet 22*
Raft & Scupper 22
Raumschach 10*
Realm 9*, 18
Redstone 21*, 22
Regatta 20*
Renge Shogi 5*
Renju 5, 6
Reversi 9*
Reviser 11*
Ricochet Robot 5
Rithmomachia 15
Robo Battle Pigs 8*
Rosette 13*
Royal Carpet 9*
Rosenkreuz 22*
Rugby Chess 8*
Sadéqa 16*
Safe Passage 22*
Salta 8*
SanQi 17*
Schada 20*
Schnapsen 20*
Selus 16*
Shatranj 19*
Shōbu 18
Siesta 11
Simultaneous Capture Go 13*
Skirrid 14
Sleeping Beauty Draughts 14*
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Splitter 21*
Sprouts 16*
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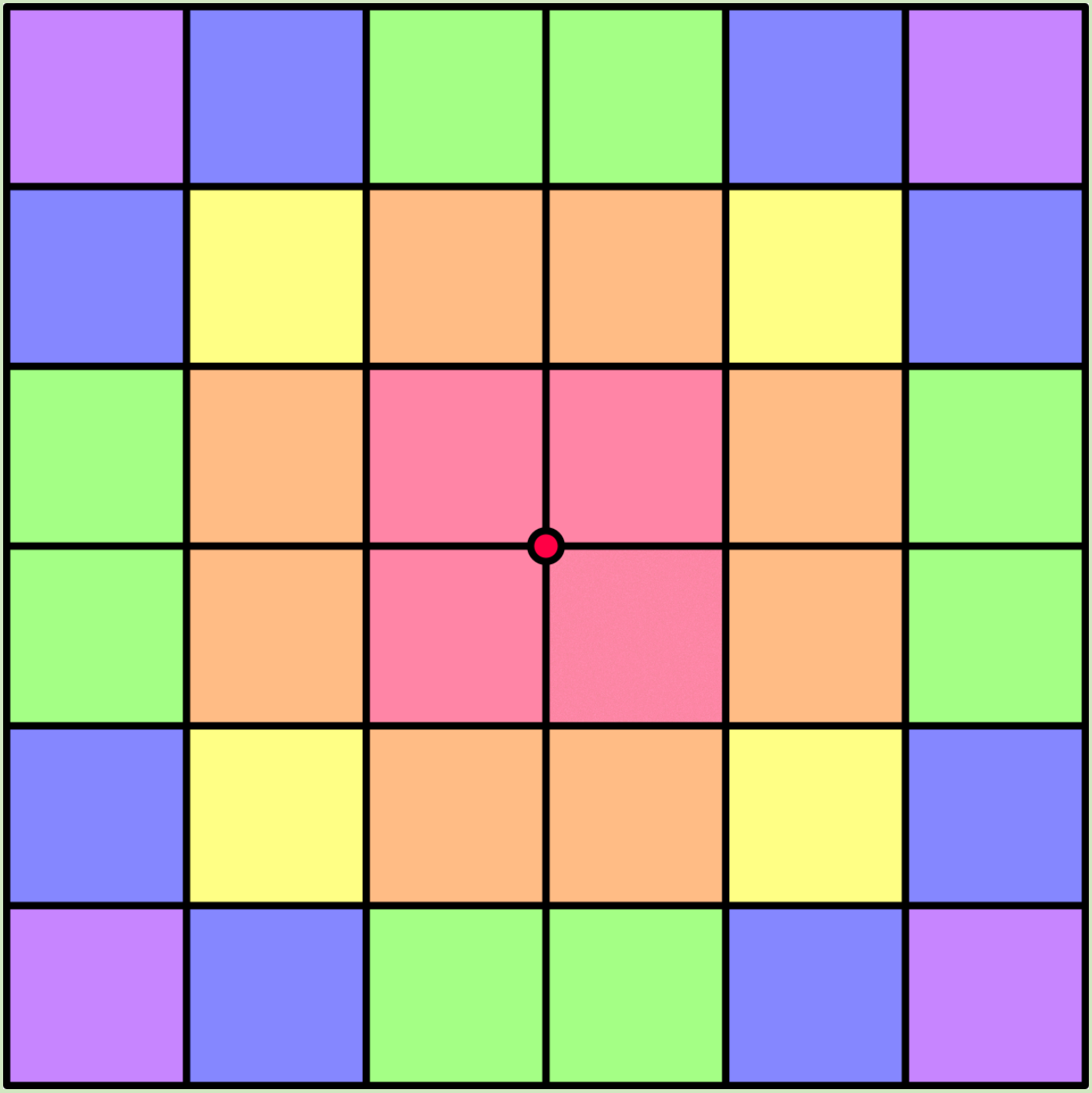
SquareBoard Connect 8*
Square Hex 5*
Star Trek 3D Chess 13*
Starfish 21*
Strat 4*
Sudden Death Grasshopper 18*
Super Chess 19*
Super Halma/Traversi 15*, 18
Surakarta 13*, 14
Symple 19*
Ta Yü 7
Tablut 16*
Tak 17
Takat 10†, 11†
Take the Brain 9*
Tamerlane Cubic Chess 12*
Tamsk 4
Tantrix 14
Three Crowns 8*
Thud 14
Tip-Top-Toe 21*
Tix 20*
Tixel 20*
Toguz Kumulak 17*
Tori Shogi 17
Transvaal 8*
Trax 1, 10*, 11
Triangle Game 8
Trippples 7
Tumbleweed 21*
Tumbling Down 6*
Twixt 2*, 4, 7, 8
Tzaar, 17
Universe 17*
Unlur 11†, 12*
Urbino 21
Vai lung thlân 12*
Wizard's Tower 21*
WYSIWYG 18*
Zèrtz 4, 6*, 7-9, 13, 14
Zhadu 11, 17*
Zola 22*

Zola



A game by Mark Steere