

*Issue 19, Summer 2020*

# *Abstract Games*

*...for the competitive thinkers.*

Super Chess: A game with Cyclops and Archer

Symple, and other games with multiple moves

Push Fight strategy and tactics

Jetan revisited

Shatranj, ancestor of modern Chess

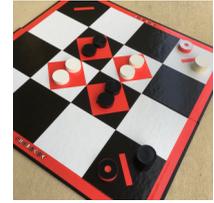
Labyrinth, James Joyce's forgotten pastime

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## Front Cover

(Image by Connie Handscomb)

Games with genuinely three-dimensional boards are relatively rare among abstract games. We do not count here games with a stacking mechanism, such as Avalam Bitaka, on the cover of *AG18*. An exception is the alignment games, such as Tic Tac Toe, and there have been numerous versions of these in three dimensions—Qubic, for example. Axiom, on the cover of *AG16*, stands out because it is both genuinely 3D and because there is no 2D original game that was extended into the third dimension. Qua, in this issue, also stands out. Not only is Qua a 3D connection game, in itself a first as far as I know, but in addition it is a connection game for three players, another rarity—but why not, with three pairs of opposite faces in a cube?

Among the genuinely 3D games, however, special attention needs to be given to the chess variants, both because of their long development and because they caught the public imagination through Star Trek 3D Chess. L. Lynn Smith wrote a series of articles on 3D Chess, and in the first of these, in *AG10*, Lynn demonstrated that the concept of chess in three dimensions goes back at least to the Eighteenth Century. There is much to investigate about this topic, and the series continued for every issue to *AG15*. Finally, Lynn's article on Quad Level 3D Chess, which should have appeared in the old series, was published in *AG17*.

The topic of the 3D chess article in *AG15*, in 2003, was the 4x4x4 cube, and Rick Hewson's game Exchequer was discussed. A newer version of Rick's game, now called 3D XYZ Chess, is shown on the cover. Actually, 3D XYZ Chess is almost identical to Exchequer, the only significant change being a two-space initial move for Pawns starting on the edge. Rick has been developing the game since 1988, so for 32 years! The perfected rule set has been stable at least since 2016.

3D XYZ Chess is played on four levels, with 4x4 spaces each, effectively a 4x4x4 array of cubes. The game thus contains 64 spaces, or cubes, the same number as a regular Chess board. Moreover, each player controls a 16-piece army that is identical to the regular Chess army, albeit with some altered powers. The board is placed with vertical corners (rather than sides) facing each player, and the pieces are positioned initially in these opposite

vertical corners.

The Rook moves in a straight line through cubes that are connected via their sides; the Bishop moves in a straight line through cubes that are connected via their edges; the Queen combines the powers of Rook and Bishop. Effectively, these pieces retain their regular Chess moves, with the proviso that they can travel also in vertical planes. The Knight has a different and entirely new move that does not correspond to anything in regular Chess—the Knight moves one cube triagonally, in other words between cubes that are connected at their corners. The King's move is constrained, and the King can move only one square orthogonally, not diagonally, both within his plane and vertically. The Pawns step one space (or two spaces initially) towards the opposite corner, and cannot move vertically. Pawns capture as they move, like the other pieces, and unlike Chess Pawns. Pawns promote to Queens upon reaching the opposite corner.

The triagonal move of the Knights is interesting, because a Knight can only reach 16 spaces, one quarter of the board. The Knights of one side together cover only half the board. One could regard this as a flaw, but I do not think it is—there is a pleasing symmetry due to the opening placement of the four Knights of both sides. The two sets of Knights do not cover each other's squares, so opposite-side Knights can never capture each other, and together the Knights of both sides cover all spaces on the board. I am sure this special move of the Knight has interesting strategic implications.

The rules of 3D XYZ Chess are clean and logical. The decades-long period of development and testing shows. The altered powers of Knight, King, and Pawn are perfectly suited to the 4x4x4 three-dimensional environment. The setup in opposite vertical corners is excellent. The set itself is beautiful, and guaranteed to create a stir if you take it into a coffee shop to play, as I have done (in pre-Covid-19 times). In my opinion, 3D XYZ Chess is a brilliant translation of regular Chess into a three-dimensional environment. This game is highly recommended, especially for someone with an interest in 3D games, and 3D chess specifically. Contact Rick Hewson at [3dxyz@bell.net](mailto:3dxyz@bell.net) for further information, including rule books and sets. ~KH



Years ago, ground-breaking new abstract games were relatively few and far between. I speak here of the period of the original series of *Abstract Games*, from 2000 to 2003. This was the time when the nascent Gifp series, for example, was attracting much attention. Surely there were even fewer new abstract games during the initial run of the old *Games & Puzzles* magazine from 1972 to 1981, at which time a new game of the quality and originality of Havannah, Entropy, or Epaminondas would create quite a stir throughout the abstract games community, and a simple deduction game like Mastermind could become widely known, even among the general public!

Among the gaming community, abstract games are still very much a minority interest. Nevertheless, the number of new abstract games of quality has increased dramatically during the first part of the current century. Designers such as Néstor Romeral Andrés, Nick Bentley, Cameron Browne, Christian Freeling, Luis Bolaños Mures, Mark Steere, Dieter Stein, and many others are producing new and original games at a breathtaking pace. The problem is not whether or not there is a new game worth playing, but rather which of a hundred new games to try, each of which alone could stand beside designs like Havannah or Epaminondas and hold its own.

I brought this point up with Cameron Browne in the interview with him in *AG17*, and his opinion was that the increase in choice was of course good. I

agree in principle, but a challenge with such an extreme variety of great new games is not so much which ones to play, but rather which game deserves the time and energy to investigate properly. I see this in myself—I get excited about a new game, and start thinking about it and playing with it a little, but then something else that is interesting comes along. My attention is pulled away. Any new abstract game stands little chance of generating a large enough community of enthusiastic players to judge its unique qualities properly.

An exceptional few games do attract sufficient attention for proper evaluation. I sometimes play on Little Golem, Boîte à Jeux, or Board Game Arena, and I can testify that the top players of the games on these sites are very, very strong. These sites, and many others, have substantial communities, and the most popular games on them have active groups. However, a very small proportion of new games reach this level of exposure, leaving a great many otherwise excellent games that are hardly played at all. For the sake of comparison, in the middle part of the Twentieth Century, Glinski's Hexagonal Chess achieved significant renown, especially in Eastern Europe, with a large body of players and regular tournaments. I cannot imagine the same happening today, despite all the opportunities on the Internet, and despite all the attention that a few top games receive.

With *Abstract Games*, we often try to point out, in so many words, "Tarry here for a while, for this is a really good game...." Of course, we can only do this for a very small number of games from the vast selection available. I certainly agree with Cameron that it is wonderful to have the large choice of excellent abstract games, although it is unfortunate that many very interesting games are not adequately investigated.

The current issue, as you will see, has somewhat of a focus on the chess variants. With the articles on Shatranj, Super Chess, 3D XYZ Chess, and Jetan,

respectively, we cover chess variants ancient, modern, hypermodern, and fantastical! All these games, I think, are worth a closer look. Of course, there are thousands of chess variants, and the chess variants particularly suffer from the syndrome of a very great many of them that nobody plays. Any selection from among the chess variants is to an extent arbitrary, but I hope the few here may catch your attention for a while—as they did for me. By the way, the solution to the Chu Shogi puzzle from *AG18* will be given in the next issue, so you still have a chance to solve it and win the complimentary print magazine.

I would like to note that we were very sad to hear of the passing of Dr. Eric Solomon. His games Entropy (*AG11*), Black Box, and Sigma File, among many others, will live forever. I suspect Eric's game Ley Lines, presented in *AG17*, was his last published game. John Horton Conway also passed away recently. Dr. Conway was primarily a mathematician, although *Winning Ways for Your Mathematical Plays* (by Conway and his co-authors, Elwyn Berlekamp, and Richard Guy) is a classic in the literature of combinatorial games. Moreover, Dr. Conway designed many games of significant interest, among which we previously covered Phutball (*AG3*), Snort (*AG15*), and Sprouts (*AG16*). Both Eric Solomon and John Conway were princes among the game designers, and their work will never be forgotten.

Stay safe! Happy gaming!



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**Publishers:** Connie & Kerry Handscomb

**Editor:** Kerry Handscomb

**Creative Director:** Connie Handscomb

**Copy editor:** Don Kirkby

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# Carnac

*...building an experience  
block by block*

by Pablo Schulman

More often than not, the physical representation of an abstract game (that is, its components) is an afterthought, something that arises for aesthetics or usability purposes. Few game ideas start with the components as the central focus of the design, but while I cannot vouch that was the case with Carnac, one is hard pressed to think (when playing it) how this game came to be if not by starting from its pieces.

Carnac was designed by Emiliano “Wentu” Venturini and published by HUCH! in 2014. The game comes with a double-sided board and 28 equal pieces called *megaliths* that fit nicely in the well-thought-out and totally functional plastic insert. On one side of the board, you will find a small board (8x5 squares) and a medium board (10x7 squares) surrounding the smaller one; on the other, a large board with 126 squares (a 14x9 grid). The pieces, which are shared by both players, are dicubes patterned with their colours/symbols. Despite their small size (approximately 1x2x1 inches), they have a hefty weight to them and are a pleasure to handle (Figure 1). Each player’s sides are easily told apart not only by their colours, but their symbols which convey the thin veneer of theme (of building megalithic structures).



Figure 1: Unfolded view of a Carnac piece showing all sides and their position relative to each other.

At the beginning of the game, players choose a board size and place the pieces within reach of both of them. On a given player’s turn (from now on, called the active player), they lay one of the pieces *upright* on the board. Now, the other player (here called the passive player) gets to decide (a) to tilt that piece or (b) leave it as is. In the former case, turn passes to the passive player; whereas in the latter case, the active player gets another turn (which always starts with a piece being placed upright). Tilting is done by laying the piece down in two neighbouring orthogonal empty spaces, leaving the original occupied space empty. If the piece is placed in a way that it cannot be tilted, turn just passes to the passive player. Players keep doing that until the common stockpile is empty or there are no more available spaces on the board. The winner is the player with the most *dolmens*, a group of at least 3 adjacent symbols of a colour, when seen from a bird’s eyes view. In case both players have the same number of dolmens, whoever has the largest dolmen wins the game.

One of the first noticeable features of Carnac is how it

uses its pieces. Not only are the pieces of a fairly rare shape, but they have both colours on them (another quite uncommon feature in abstract games). This by itself would be enough to say Carnac is unique, but the manipulation of the pieces is what really sets it apart from other games. More specifically, I am referring to the protocol for tilting them.

First of all, I am not aware of many abstract games that rely on this kind of mechanism. To my knowledge, only Quarto (designed by Blaise Muller and published by Gigamic) precedes Carnac on the usage of this kind of “I cut, you choose” mechanism (besides the pie rule). This somewhat rare mechanism creates an interesting dynamic, engaging players at all times, since they play a role even when it is not their “active” turn (thus minimizing any feeling of downtime).

It also lets players experience different decisions throughout the game. The active player needs to pay attention to the sides they are providing to the passive player, as well as the possible positions resulting from the way the piece is placed: a good active player will limit the options available to the passive player and “induce” a particular tilting (or lack of) with good placement. Meanwhile the passive player chooses how the piece ultimately will end up (from the options provided by the active player, of course). To tilt a piece (or how to do it) is not as straightforward a decision as it might seem. One thing that novices may take some games to understand is how valid an option it is to leave the piece standing. If the active player places a megalith in such a way where the passive player’s only tilting option will merge two dolmens (thus decreasing this player’s score by one), the passive player may choose to leave that piece as is (Figure 2).



Figure 2: In this situation (left panel), if white places the megalith in such a way that (middle panel), if tilted, it connects both red dolmens (right panel), red might not tilt it but try to salvage the situation later on.

Another interesting decision taken by the designer was to set a fixed number of pieces regardless of board size. Take into consideration that—at least in my experience—the vast majority of games end with an empty stockpile and you will see that there is a huge difference in covered spaces between the three provided board sizes. This fact has tactical/strategic implications: the smaller size is so cramped that forced tilting—or placements with no tilting option—is more frequent. In the larger size, it is harder to induce a particular tilting, given there is so much real estate on the board, but it does happen given pieces tend to be placed in clusters. The medium size is, as one can imagine, right in between the other two and, personally, my favourite to play.

Although Wentu didn’t invent any of the features in Carnac (shared pieces, dicubic pieces, “I cut, you choose”), by combining them, he created a unique game (and experience). Years ago, I stated it was one of the most original abstract games of the modern era, and I stand by my statement. Carnac, to me, is a great example of a modern abstract. It provides a good number of decisions in a small playing time, it is beautiful to look at and it does not play like anything else. I highly recommend it.

You can try Carnac at [boardspace.net](http://boardspace.net). ■

# Meet Dameo!

by Aleh Tapalnitski

Reviewed by Kerry Handscomb

**D**ameo is Christian Freeling's attempt to perfect checkers. We discussed Dameo in *AG10*, with some problems in *AG11*. Aleh Tapalnitski is a checkers expert from Minsk in Belarus. His small book, *Meet Dameo!*, is available as a free PDF and is published on Christian Freeling's Mindsports website. *Meet Dameo!* is one of those rare contributions to the world of abstract gaming, in that it is devoted entirely to a single game. Of course, there are thousands of books on Chess, or Go, or Bridge, for example, but among the relatively little known modern abstract games the new fan often has very little to go on. Other examples of this genre are Bill Leighton's *Mastering Tak, Level 1: A foundation for success* and Randy Ingersoll's *Play Hive like a Champion*, both discussed in *AG17*. We should cherish these works as labours of love that bring some of the higher concepts of their games within easy reach for new players.

Aleh's book contains the rules of Dameo and twelve succeeding sections in which he discusses some key concepts. Players of Anglo-American Checkers or International Checkers will recognize many of these ideas, which include the Royal Hit, the Turkish Hit, the Trap Door, and so on. It is interesting and significant that much of the theory of checkers is common to multiple checkers variants. The same is true of course with concepts like Fork and Pin across the chess variants, but I think checkers is special in the multitude and complexity of ideas that are present in corresponding ways in various forms of the game. Among the checkers variants, nevertheless, Dameo is special in the low incidence of its drawn games. Even a small advantage can be converted into a win, because two Kings always defeat one King.

Following his presentation of these important concepts, Aleh gives 14 problems rated from 1 to 5 in terms of their level of difficulty. Lastly, he presents three complete games annotated in considerable detail. Throughout the book, in fact, Aleh's analysis is clear and easy to follow.

I asked Aleh how he became so knowledgeable about this relatively new game, because after all I think nothing like this has ever been done for Dameo. Aleh, it turns out, is a very strong amateur player of International Checkers, who became disillusioned with the drawishness of his game, where even three Kings usually can do no more than draw against one King. He tried Frisian Checkers (*AG10*), which, like Dameo, overcomes the drawishness of International Checkers, but found the method of capture "... quite difficult for the eyes to perceive and not very beautiful." In any case, says he managed to reach his current level of expertise one year after coming to Dameo. His comments to me about this journey are given opposite.

Certainly, Aleh gives good advice about how to become strong at any abstract game. Talent is good, but regular—even daily—study is more important. That needs discipline! Interestingly, the method of study he advises is to play games against yourself. How simple and obvious that is. After all, I suppose, with a new abstract game, there is nothing written about it, and you have to begin from the beginning. The method is solo, with focused experimentation, rather than the unpredictable free-for-all against another player.

I recommend you to check out Aleh's book. He admirably illustrates the beauty and complexity of checkers in this new and (hopefully!) perfected form of the game. Below are two puzzles from the book. The solutions are on page 15. ■

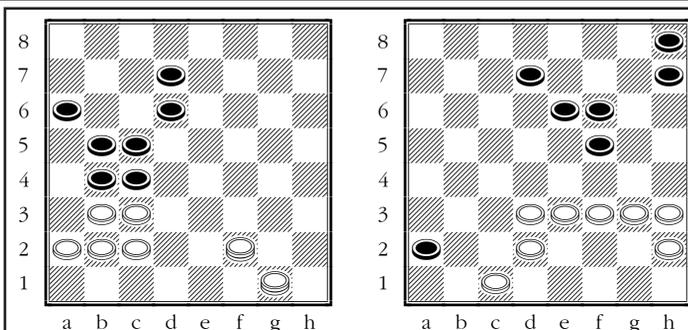
"Our most popular games are Chess and Checkers (Russian 8x8 and International 10x10). But at a high level, there is a very large percentage of draws, and the opening theory is developed very deeply. I was looking for a game where you can create from the first moves. In addition, two Kings must catch one King, which allows you to bring the smallest advantage to victory. It is wrong endlessly to divide the result of the game in half—draw, draw, draw... Surely one of the players played better and more strongly than the other.

"In Dameo, the number of moves and options is huge, there is no opening theory, and most importantly, there are a very high percentage of wins! The King has enormous power, and two Kings are able to crush almost any opponent. I used to think that the main thing in Dameo is to have a King at almost any price, and this is often true. But in my book, I have shown several examples where the unusual mobility of the King suddenly leads to defeat.

"As for my strength in Dameo, I can say the following: only constant play and analysis of games played (especially your lost ones!) can raise your level. It sounds simple, everyone understands it, but it takes willpower to do it. I play a game with myself every day. This takes a maximum of 30-40 minutes. Of course, in training games, I experiment a lot, play for both sides in different styles and get interesting positions with great combination opportunities. Any player can do this for half an hour, but every day. This will allow you to avoid simple mistakes in the future and it strongly develops your intuition. Many of my examples in the book are taken from training games.

"As you can see, everything is simple. For example, all strong Chess players in the pre-computer era constantly played and endlessly analyzed, and they did not part with the chessboard. There were no computers or Internet, so the brain worked with maximum efficiency.

"I don't reveal any secrets. Yes, a player should have talent, but without daily work and practice, this talent fades."

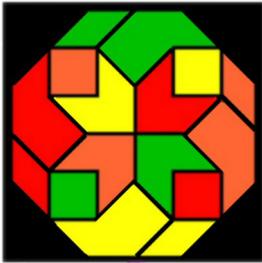


*Puzzle 1: Black to move. White has two kings and seems to have complete control over the situation. It is a pity that the hit c5a3 does not save Black. Prepare another majority capture. The inspiration for the combination is the unfortunate position of the white Kings. Black wins!*

*Puzzle 2: White to move. Despite material advantage White's position seems hopeless. But there is salvation! With sacrifices first, White wins.*

Download *Meet Dameo!* free from <http://mindsports.nl/images/stories/arena/damvar/Dameo.pdf>

*Kate Jones is the founder and owner of Kadon Enterprises, which has been producing gorgeous games and puzzles for decades. Many of the images throughout this interview illustrate the geometrical puzzles created by Kate and her associates. However, Kadon also offers a selection of traditional and modern abstract games in beautiful editions. In particular, the Game of Y and \*Star, both created by the legendary Ea Ea (Craig Schensted), are sold in high-quality wooden editions—I don't think Ea Ea's creations are available anywhere else. Another interesting game produced exclusively by Kadon is Quantum, which has a brilliant and unusual way of randomizing the initial position. I hope we can take a close look at Quantum in a future issue. John McCallion's questions below are italicized. ~Ed.*



## Kate Jones Explained

by John McCallion

*Dare I say that your website is the most seductively dazzling in the world of games and puzzles? Have you been interested in this world from an early age, and what prompted your first step on a remarkable journey that began over 40 years ago?*

Well, thank you for the compliment on the website that I have been building almost singlehandedly since 1998. My graphic art background and predilection for structure helped.

As for my interest and first steps in this direction, my short answer is Spock-like: “It was the logical thing to do.” A somewhat extended string of causality found me playing with mosaic wood tiles while bedridden with chicken pox at age 4. I would sit there and make new designs for hours. That’s probably what planted the seed of system, order, variety, combinations and permutations, symmetry and creativity, and stirred certain brain functions to life. Of course, I had no knowledge of any of those words or their meanings until decades later. I was just having fun. Decades later, this little puzzle, Rombix Jr., top left, the closest relative to my childhood set, became one of our products. As Spock would say, “Fascinating.”

As all this happened in “the old country” in a previous century, my family played classical games like Parcheesi, Rummy, Nine Men’s Morris (Muhle), and Chess, and outdoors hopscotch on the sidewalk or bouncing a tennis ball against the outside house wall, batting it with my palm sequentially from one to twenty times. All still were played with patterns and rhythms.

Geometry had captured my imagination, and later, in all my years of schooling in Germany and Connecticut, my best subjects were math and art and geometry. So were languages, since grammar and vocabulary I saw as a kind of assembly of puzzle parts into coherent structures. I loved “diagramming” sentences, a method I learned in seventh grade. And my mind made the connection to logic, order, coherence, epistemology, and truth. Of course, I knew nothing of those concepts at the time, either, though I was joyfully swimming in them with every breath.

Upon graduation from high school I worked as a Girl Friday in the advertising office of a department store in Bridgeport, Connecticut, where I learned on the job about layout (structure), copywriting (language use), and illustration (art). On

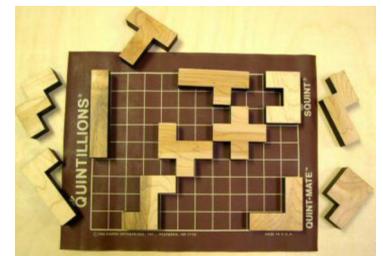
the side I was offering proofreading, editing, and document preparation for individual clients. And evenings I learned to become a ballroom dance teacher, which expanded my system and structure into 3D geometry of movement and the 4th dimension of time with the rhythm of music. All fed my future path.

Fast forward past marriage, children, and divorce, I had a variety of jobs in offices dealing with documents, with private clients who needed editing and proofreading, and an evening job of teaching at a dance studio in Washington, DC. There I met the love of my life, married him, won many trophies in dance competitions, quit my day job and started my own graphic arts business in Virginia. In 1975 we moved to Iran when his engineering job sent him abroad to “transfer technology” to the Shah. As an expatriate wife, I occupied myself with helping out in a local printshop and running some dance classes for the American community. Fate took a hand.

While on a weekend jaunt to Dubai in 1976, in the airport newsstand, I came across and purchased a new book by one of my favourite sci-fi authors, Arthur C. Clarke: *Imperial Earth*. Fate swatted me alongside the head, because in that book Clarke described a puzzle set of 12 pieces, each a different arrangement of 5 squares. Later I learned that their name was “pentominoes.” A galactic plot hinged on forming them into a 3x20 rectangle. That task was irresistible to me, so I set the book aside and made myself some cardboard cutouts of the pieces and proceeded to try to solve them. By the time I succeeded, I was thoroughly hooked, and as the months went by, my research with them filled notebooks. Now it so happened that Iran, and particularly the city of Shiraz where we lived, has some incredible craftspeople skilled in the art of inlay. On a visit to the bazaar, filled with the aroma of a hundred spices, I searched out a craftsman and commissioned him to make me a formal set of the 12 shapes. It took a while and cost a bunch, but is probably my most beautiful possession.



*Pentominoes*



*Quintillions*

In 1978 a revolution broke out in Iran, and the Americans shipped out on 3 days’ notice. Back in Maryland, after I sold my business in Virginia, the question became: “What do I do next?” A friend suggested starting a business making that puzzle set. We explored making it in wood, found a laser shop to cut them, named them Quintillions, and the rest is history.

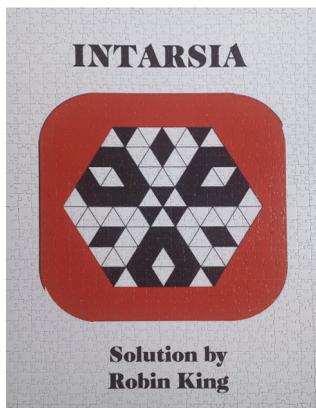
Selling was a whole new adventure, and I quickly learned that stores would not want to sell an item no one knew about or would require the store clerk to explain it. Moreover, a store wanted to buy it so cheap that we’d lose money on every set. So that was a no-go. Finally I found a way to market it that has worked for 40 years: sell our beautiful, unique handcrafted work at art shows, little by little adding interesting new products to our repertoire, inspired by what was becoming our leitmotif: puzzle sets of geometric shapes that represented all the members of a certain concept. *Gamepuzzles* was born.

Year by year I printed a bigger catalogue and pioneered

both wooden and laser-cut acrylic methods of production. In 1998 came the breakthrough to computer use and a fledgling website that eventually relieved us of the expense of a printed catalogue. We owe an enormous debt to the inventors and developers of digital technology and coding. It's like magic... type a few symbols and see a colourful presentation on-screen. Then, for good measure, print those images onto paper. Today's generation can take all that for granted as part of normal life, with no clue of the hardships those earlier forms of documentation entailed, back to Mr. Gutenberg.

*My late wife, Robin, was the puzzles expert in our household, and she was a great teacher who introduced them to me. I found them so fascinating for all levels of solver that I regret they are not more widely available. Have you ever considered letting others develop them for a mass market, or are they irrevocably destined to remain expensive artistry for connoisseurs? I would add that they are still tremendous value for your prices.*

It was very gratifying to have an intellect like Robin embrace our work. I miss her, and to this day her incredible solution of our Intarsia set graces a poster, and the image below shows it made into a jig-saw puzzle.



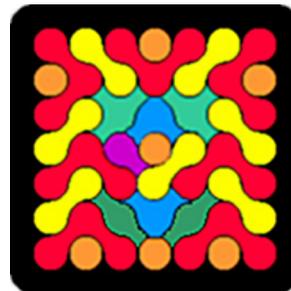
*Intarsia: Created by Henrik Morast, developed by Kate Jones, this solution by Robin King.*

What we learned through all the years is that quality counts. It doesn't need to be expensive, though not as cheap as plastic produced in China. We also learned that such intellectually aimed products are what you'd call a "niche" market. The mass market does not have an appreciation or even an interest in such goods, compared to what else is available out there. Also, the popular game forms (Euro games, role-playing games, LARP) and finally electronic games took over as the main interest. Tetris was a great breakthrough in popularizing puzzles of the kind we make, combining the puzzle shapes with electronic manipulation. Tetris turned millions of people into robots operating buttons that moved pieces around—not the same as our self-directed, hands-on constructions.

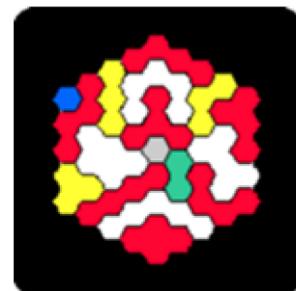
As it turned out, one enlightened game company, CEACO, and its subsidiary, Brainwright, did take the daring step of licensing three of our puzzles for mass production: Roundominoes, Hexnut Jr., and Iamond Hex.

These three were produced in very nice laser-cut plastic in China and sold through bookstores, mainly Barnes & Noble. As the original production run sold off, however, they did not make more, and only a few are still left out there. Stores thrive on novelty and mercilessly purge old stuff, unless it reaches the stature of a

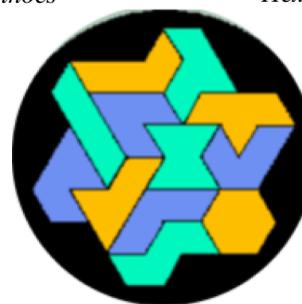
standard like Chess, Checkers, Backgammon, Monopoly, or Scrabble. We would consider licensing some of our other original products, if the mass production still respected the quality and aesthetics that are our trademark. Since we never discontinue a product once we publish it, having a temporary version circulating in the commercial world and trickling some royalties our way would be fine.



Roundominoes



Hexnut Jr.



Iamond Hex

And yes, our prices are very low, just about at break-even levels. We manage because of lower overhead, working on our own premises, and having a website that spares us from printing costs. And the president of the company works without pay. We give her shares of stock now and then. Most of the other long-time helpers are also shareholders. No, they don't expect non-existing dividends.

*You once stunned me by despising Checkers as a game whose object was "genocide." Can you not convince yourself, for example, that captured pieces withdraw from society to become very successful hunter-gatherers as predicted by the Libertarian philosophy you candidly support? What is your ideal for a game, and which of those you sell best reflects this?*

Wow, that's a powerful question. Let's look at early games that humans played. Humans are unique in creating replicas of world situations, either for amusement or for teaching. Humans are also unique in "seeing" equivalent patterns and formulating them as metaphors, similes, analogies, fables, and microcosms that deal with the survival problems in the real world. Our brains work that way. We make comparisons and categorize, replaying the world as we see it.

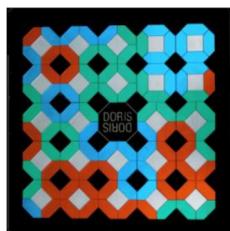
One of the earliest games we know of is Mancala, probably played with pebbles or kernels or even coins. I can see the caravans that brought goods across the continents, from China across Asia and the Indian subcontinent into Africa and Europe, with elephants and camels. And at night, at camp fires, the merchants would hollow out rows of bowls in the sand and play a calculating game of acquisition. Mancala is one of the oldest formatted games. Our Game of the Labyrinth, researched by Peter Aleff, may be the most ancient game board, from 3500 years ago.

It is a race to the finish, not war, and allows a measure of strategic choice, not just pure luck. It is the ancestor of chance games people still play today the world over, such as Candyland, Chutes and Ladders, Parcheesi, and Sorry, that are a race to the finish on spaces the pawns follow.

Chess was born in India around the seventh century, symbolizing two armies at war, each headed by a King and Queen, with the goal of capturing/conquering the opposing king. It's nice to think that perhaps the game was invented to substitute for actual war, and instead of slaughtering all the combatants, the losing side would simply surrender and save all the bloodshed. We see thereby that violent conquest is a fact of life among the world's competing populations.

Checkers came from AlQuerques, an Arabic game from the tenth century, with two opposing sets of pieces bent on eliminating all of the other side. Yes, I interpret that as symbolic genocide, a practice not unknown in the ancient world when desired territories had to be emptied of occupants to make room for the conquering tribe. No delicate substitution of plot is acceptable. If the side to be eliminated is not slaughtered outright, they may escape to some other region, or they may be simply enslaved by the conqueror. Those are historical realities. These atrocities begat human invention of weaponry, non-stop, to today's nuclear arsenal.

We do make one game that sugarcoats the capturing theme. In Doris, spaceships go across the void and "rescue" the other player's spaceship by linking to it by colour and towing it back to port.



Doris

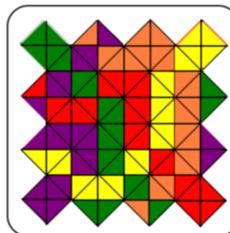
You mention hunter-gatherers. That mentality, unfortunately, is still with us, taking whatever one can, disregarding the civilized development of property rights. Plunder and expropriation are official policy, called taxes. If you become too successful, you are condemned as "rich" and must be made to give it back. That is not Libertarian philosophy. So the game of Monopoly emerged, a tribute to avarice and gloating over the misfortunes of others. Notice that it throws the players into impoverishment not through their own choice but by roll of the dice. In real life, people can avoid going to spaces that impoverish.

Games of chance are a two-edged sword: they can dump the players into misfortune against their better judgment, or they can console a player that next time will be luckier. So I'm not fond of dice games in general.

We can trace social developments through the evolution of games. Conflict is usually the main draw, and overcoming a specific opponent is the usual goal. Educational strategies that apply in real-life situations are a kind of indoctrination. They intend to habituate players' conscience to accept destruction of the opponent as pleasurable. I consider that unconscionable.

From what I understand of Dungeons & Dragons, it operates on human teams collaborating and pooling their various individual skills and powers to defeat some non-human monsters or other symbolic evils, and that is a historic innovation. Bravo, Gary Gygax.

My ideal for a game is indeed non-predatory, cooperative and mutual problem-solving, positive achievement, not viewing the other player(s) as enemies. In some of my more recent games, players can trade pieces if it helps both of them to complete a figure or goal and even earn bonus points for that. Another theme is where all players contribute to a mutual goal, and where each player's contribution is important, and all players win. "Trade" is one of the non-predatory objectives, in the games Marshall Squares and MemorIQ.



Marshall Squares



MemorIQ

Perhaps my most unusual game is Fox Blox, a set of 4 cubes containing one complete alphabet, one letter per side plus two sides with two letters. The goal is to make sentences using four letters rolled randomly as the initials of different words. Each player rolls and adds a new line, and pairs of lines must rhyme. There are no wrong answers, and players can suggest words even when it's not their turn. Everyone wins when the opus is complete. It's hilarious.



Fox Blox



Lemma

My other unique and non-predatory game is Lemma, a rule-inventing meta-game where each turn adds one new rule, along with a piece placement or movement that shows that rule in action. All rules stay in effect, and no action may go against any previous rule, and no new rule may contradict any previous rule. Wild! The board design lets players use points, lines, and spaces in every possible way their imaginations may suggest. There are even some more normal games playable on this grid, like AlQuerques and a sort of Chinese Checkers, plus hundreds of solitaire puzzles.

*If you miraculously find time to explore games not produced by you, what are your favourites? Can you nominate a game you detest even more than Checkers?*

Well, I have played and enjoyed several games not of our own making, like Backgammon (learned it in Iran, where it was invented), notwithstanding that it uses dice. It is a race to the finish, not a war of annihilation. Likewise, Chinese Checkers is a race, not war, and there are some very beautiful sets made in wood by craftsmen I know. I absolutely love another game I wish we had made, and that is Set. Find a matching group of cards with all the same or all different characteristics. Superb! One of our products has such a theme, but they did it much better. One other game that I don't have time to play but wish I could is the very attractive Qwirkle that is a kissing cousin of our style of game.

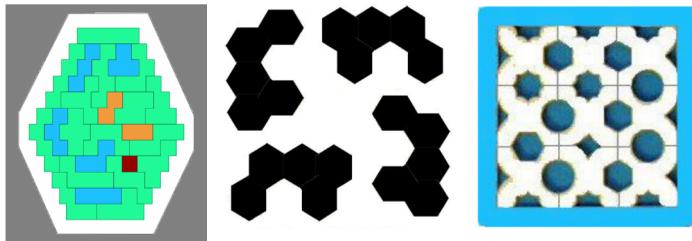
As for what game I detest more than Checkers, I'm not

sure there is anything more despicable than genocide. Football comes close, since it requires players to physically damage each other, notwithstanding helmets and padding, with the symbolism of getting their sperm (the ball) into the other team's receptacle. Rape? Bet you've never thought of football in those terms.

*Do you welcome submissions from unknown game designers? How have you found talented designers in the past?*

I frequently receive appeals from designers to publish their work. I have a soft spot in my head and heart for my fellow creative spirits, so will take a thorough look at their sendings. Unfortunately, I have a very specific list of criteria, and very few submissions come close to meeting them. Nevertheless, over the years there have been several designers who have found us—I don't go looking for them—and come up with great ideas that I've been able to develop and style in award-winning ways. I always tell them, though, that they ought to try with the "big" game companies first, since we are a low-circulation niche operation and will not make them rich. The one thing I can promise them is that if I publish it, I will never discontinue it. We pay decent royalties and highlight inventors in our website, so they don't stay "unknown" for long.

Some of our best ideas have come from within our own team of helpers who get inspired by our product line to create compatible designs, like Thomas Atkinson's Hopscotch and Elijah Allen's Four Horses of the Epic Ellipse and MiniTouch-I. I get the fun of naming them. Elijah has a new boardgame we'll be publishing soon of major philosophical import: the cosmic struggle between good and evil.



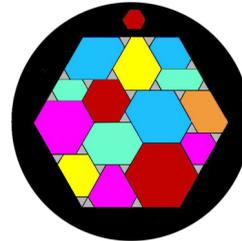
*Hopscotch*     *Four Horses of the Epic Ellipse*     *MiniTouch-I*

Our international stable of talents is quite impressive, and many of our products have quite a pedigree. Our youngest was a high school student! We have inventors from Denmark, Germany, Netherlands, France, Brazil, Serbia, England, Switzerland, Thailand, Canada, U.S., Australia, New Zealand... amazing, isn't it? Sadly, after 40 years a few have passed away; their names continue in the website with an eternal flame.

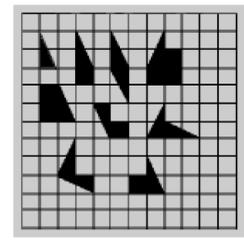
The one unique aspect of our enterprise is that we don't borrow. Everything is financed from within, so a new product has to wait until there is enough saved up to launch it and cover the costs of its production and introduction. So there are always new ideas simmering on a backburner and, right now (2020), two hot items are bubbling over in front.

We introduced four terrific new ones by outside designers in 2019: Hex-Pave by Carl Hoff, Shardinaires-9 by George Sicherman, StarHex-I by Theo Geerinck, and Twenty-Tans by Hans Weidig IV.

Hans Weidig has become a member of Kadon's inner circle of shareholders, helpers, and designers. He is one of the gamemasters at our Maryland Renaissance Festival pavilion, and his Twenty-Tans is a clever take-off on tangrams with four colours and wicked challenges. His new boardgame design is in R&D.



*Hex-Pave*



*Shardinaires-9*



*StarHex-I*



*Twenty-Tans*

I must mention that the Shardinaires-9 set is especially significant because it represents an amazing dissection of a square into nine all-different tiles that can be arranged to form any of the 12 pentominoes (remember those—our first puzzle?) and any of the five tetrominoes (the shapes that Tetris made famous). That means that five squares can be equal in area to four squares. Whee! See the shapes of the tiles with their hypotenuse cutting through the diagonal of... not a square but a domino! This design of George Sicherman's is so brilliant that he wins our Gamepuzzles Annual Pentomino Excellence award for 2019. Continuing research with the set is turning up ever new discoveries of symmetries, convex and concave polygons, and fanciful figures, like this little running man below. The strategy game I invented for it is another non-violent new theme: build a polygon by adding one piece at a time and score the number of perimeter edges you form; then reposition any one piece and score the number by which the perimeter length has been reduced.

Play on! ■



Kadon Enterprises website: <http://www.gamepuzzles.com>.

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*We were very happy for John McCallion to conduct this interview with Kate Jones. John withdrew entirely from the world of games after the passing of his wife, Robin King, in 2013. Only his long and close connection with Kate could entice him to return briefly from retirement for this interview. The story of John and Robin is explained in a BoardGameGeek post (<https://boardgamegeek.com/blogpost/33983/story-john-robin-pt-1>). It was a relationship that began with correspondence Chess and continued with their love of games more generally. I have known John since my days with the correspondence games club, kNights of the Square Table (NOST) in the late 1990's, even before the initial run of Abstract Games. (See also the Super Chess article in this issue.) John was then editor of the NOST journal Nost-algia, and subsequently Traditional Boardgames Editor for Games magazine. He and Robin were close associates in New York of iconic game designer, author, and collector Sid Sackson. ~ Ed.*



# The Movement Protocol of Symple

by David Ploog

**S**ymple is a board game invented in 2010 by Christan Freeling and Benedikt Rosenau. The Dutch eminence considers it one out of six major achievements among his enormous oeuvre. When playing the game for the first time, what particularly stands out is the curious method of placing stones on the board: not one, two or any other fixed number, but a variable quantity depending on the position. This is the so-called Symple movement protocol.



## What is a movement protocol?

Back in the day, this would have been a silly question. In all old games, the two players would take turns with each move being a single action for one of their *own* pieces.

Chess: White moves a white piece, Black moves a black piece, etc.  
Go: Black places a black stone, White places a white stone, etc.

The only meaningful input is who starts, and that is just an arbitrary convention. Castling is a curious one-off double movement in Chess, not challenging the paradigm. One might think that sowing games (mancalas) deviate with their many undifferentiated seeds. But even there, a player's action consists of emptying one pit on the *player's* side.

Many interesting deviations from that traditional dogma have been invented, and some standards seem to have emerged. These are the basic types, in increasing complexity:

- Multiple moves for single pieces.
- Single action for many, pattern-based pieces.
- Multiple, independent moves or placements.

### *Multiple moves for single pieces*

Iterated jumps in the Checkers family are an early instance, and similarly with chained captures in Fanorona. Halma and Chinese Checkers take multiple jumps for movement. In the crossing game Gyges (Claude Leroy, 1985), a single piece can keep moving under certain conditions.

### *Single action for many, pattern-based pieces*

In some games, many pieces can move at once, depending on their pattern. Examples are phalanx movement in Epaminondas (Robert Abbott, 1975), flocks in Volo (Dieter Stein, 2010) or Cannon's cannons (David E. Witcher, 2003). Beyond movement games, a turn in Dispatch (Chris Dissemble & João Pedro Neto, 2002) is the

placement of a pentomino. All these rules provide a single, if large, action for each turn.

Many mancalas are of this type: a player chooses a pit and then proceeds to sow that pit's seeds according to the rules. Potentially very many seeds are moved, but the player's choice was about the pit. Some mancalas double up on this mechanic, by having the player keep sowing, always from the pit receiving the previous round's last seed. The turns take longer but I say these are still single actions because there are no further decisions involved.

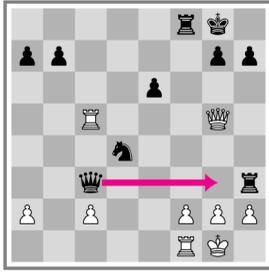
### *Multiple, independent moves or placements*

This is what I believe most people mean by "movement protocol." The reason is that such rules can, in principle, be applied to very many games—these do not depend on particular spatial or movement patterns.

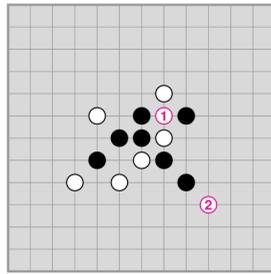
A modest movement protocol beyond the old default is to allow two basic actions per turn. The alignment game Connect6 (I-Chen Wu, 2003) is a good example: players get to place two stones of their colour in each turn, except for the very first turn with only one placement. This is a smart way of fixing the second-player disadvantage in classic alignment games such as Gomoku. This movement protocol is denoted 12\*, as a shorthand for 1222..., where the asterisk \* indicates that the last number is repeated forever.

In fact, many games use double actions in some form, for example Slither (Corey Clark, 2010) with mandatory placement and optional movement, and Amazons (Walter Zamkuskas, 1988) with movement and shooting. Note that in these games the two basic actions are different. Another design making good use of the 12\* protocol is the four-colour territorial game Blooms (Nick Bentley, 2018). The chain-scoring game Catchup (2010) by the same designer follows mostly a double-action protocol but if a player takes a lead, then the opponent is allowed three actions.

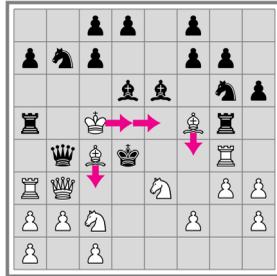
It is interesting to discuss more extravagant movement protocols for a bit. A well-known modern game is Arimaa (Omar Syed, 2002) where each turn consists of up to four actions, i.e., the 4\* movement protocol. Games with turns made up of many actions work better if the single actions are simple. For example, an Arimaa action is to move one piece of the active player exactly one (orthogonal) step. Played with the 1\* protocol, this would give a meaningful, if very slow, game. In the actual, 4\* rules, a player can carry out up to four of these actions. In particular, the same piece can be moved several times, and it is not necessary to use up all actions. Compared to Chess with its single actions, but long-ranging pieces, the branching factor goes up tremendously. This was one design goal of Arimaa's inventor.



Chess: Single action



Connect6: Two actions



Arimaa: Four actions

In theory, one can apply a movement protocol such as 12\* to any game. Generally, this will produce a set of rules that is worse or just does not work. For example, while 12\* Chess is a cute distraction, 12\* Go is a wretched monstrosity. Contrary to that, the 12\* protocol is used in Connect6 to solve a problem, the disadvantage of going second in classic 1\* alignment games. Note that Renju addresses this shortcoming in an entirely different way. In my opinion, the approach by Connect6 is more elegant and commendable—here the 12\* protocol truly shines.



### Games with long turns

Needless to say, people have pushed the envelope. An extreme case is Progressive Chess, where White starts with a single move; then Black makes two consecutive moves; White next gets three moves etc. This protocol is denoted 1234+ where the plus symbol + indicates that the sequence keeps increasing. There are special rules for check and, of course, variants. However, compared to orthodox Chess as a strategy game, this movement protocol is rather an amusing gimmick, I would say. The main website on Chess variants confirms this impression, stating that “Games are intense, and few last for more than seven successive turns.”

Out of an entirely different corner of game design, many war games (combat simulations) and computer strategy games allow the player to move many or even all units in a given turn. I believe that this tradition had repercussions on the design of abstract board games. Of course, a computer interface can make very long turns a lot more amenable. As an aside, one of the great design decisions of the early Heroes of Might & Magic computer games was to restrict movement to at most eight stacks. Not being able to micro manage every unit makes for shorter, clearer and much more meaningful turns.

Let me provide some substance for the claimed connection between multi-action war and abstract games. Of the titles mentioned below, Crosshairs has a World War I aerial fight theme, Fibonacci is science fiction war-themed, and Conquest is essentially a combinatorial war game set in the time of Rome and

Carthage.

Here is a list of interesting titles having eventually three or more actions, sorted by turn length (there are very, very many double action games by now, so I skip those):

2323**	Chain Lightning	(Andrew Juell, 2010)
3*	Push Fight	(Brett Picotte, 2008)
2424**	Unfair	(Stephen Tavener, 2015)
4*	Arimaa	(Omar Syed, 2002)
1122334455*	Crosshairs	(Stephen Tavener, 2010)
123456*	Fibonacci	(Thomas Naylor, 1990)
112233++	Mu Velox	(Christian Freeling, 1986)

The rules may assign different numbers of actions to each side. Of the games in the table, Chain Lightning is an asymmetric connection game and Unfair is an asymmetric alignment game. For all games listed, there is rule-given upper limit on the number of actions. For Mu Velox, the precursor to Storisende, this is not obvious but a player gets to move one piece from each segment controlled by the player at the start of a turn.

### The branching explosion

While any multiple-move protocol can be applied to an existing game, results will be mixed. Beyond 12\* Go, someone might come up with Progressive Go, i.e., Go with the 1234+ protocol; obviously, this is a bizarre failure of a game.

So it is not easy to make a good multi-action abstract board game, for two reasons: First, the rules should work seamlessly without computer aid. With long turns, this can become problematic. Second, multi-action turns increase the branching rate drastically—far more so than increasing the board size! For example, consider a pure placement game such as Gomoku or Hex on an  $N \times N$  board. With the standard 1\* protocol, the branching rate is  $N^2$ . Doubling the length of the board increases the branching rate to  $(2N)^2$ , yielding an increase by factor 4. But keeping the  $N \times N$  board and using the 2\* protocol leads to a branching rate of  $N^4$ . While this is often the desired design goal, it hampers clarity if done carelessly: players simply cannot plan ahead meaningfully.

Through this branching explosion, I believe that speeding up a game, for instance by going from 1\* to 12\*, often ramps up tactical depth. However, I am skeptical about strategic heuristics, and worry that a game not designed for a particular protocol will suffer and have its strategic concepts undermined. One way to deal with this is by accompanying a faster movement protocol with restrictions. This train of thought is explored in the article "Mutators for Restrictive Game Play" by João Pedro Neto and Bill Taylor (*Game & Puzzle Design*, Vol. 1, No. 1 (2015), pp. 1–3).

### Non-partisan movement and placement

There is a different way in which the traditional movement protocol can be opened up: instead of having a player only move or place pieces of that player's colour, it could allow the other colour or, for multi-action protocols, both. For example, in Xodd (Luis Bolaños Mures, 2011), a player's turn consists of placing two stones of either colour on empty points (except for the very first turn which is only a single placement).

Going beyond that, some games have stones or pieces belonging to neither player. There are some interesting designs of that kind but I adhere to the old-fashioned Manichean school where pieces are either black or white, and so I will not dwell on such games. Interesting and fun games of that kind are Nex (João

Pedro Neto, 2004), Santorini (Gordon Hamilton, 2004), and Iquishiqui (João Pedro Neto & Bill Taylor, 2003).

*Action points*

Yet another approach to generalized movement is an action-point system. This means that for each turn, a player has a contingent of points to spend on various actions which can have different costs. This device is often used in proprietary, themed strategy board games. But some of them behave, when restricted to two players, just like abstract games with perfect information and no chance elements.

I mention four examples: Hare & Tortoise (David Parlett, 1973) is a racing game with an action-point engine; Conquest (Donald Benge, 1974) has 20 action points to use on its chariots, elephants, and other units; quite famous is Torres (Michael Kiesling & Wolfgang Kramer, 1999) which, as a two-player game with the master rules, is a luckless tower-scoring game with five action points per turn; Terra Nova (Gaetano Evola & Rosanna Leocata, 2006) is a themed area majority game with three action points per turn.

To me, elaborate systems with many action types are less elegant than sequences of one or two basic actions; similarly, I prefer visual scoring of areas or captives over intricate victory point systems. Irrespective of my opinion, some inventors came up with movement protocols that allow very long sequences of simple basic actions. Of course, there will almost always be an upper bound to turn length, dictated by the dimensions of the board: here I am looking for games where the number of actions (a) can become large, and (b) is not a priori capped by the rules. I will move towards Symple by focusing on games with massive turns



**Protocols allowing very long turns**

Could Progressive Chess or, more generally, the 1234+ protocol applied to any game, be an example? No: Chess was designed for the traditional 1\* and, as the above quote about Progressive Chess shows, turns do not become very long. I am not aware of any game that works well with this protocol. There are two deeper reasons why 1234+ is flawed in itself, independently of Chess. First, in a game using this protocol and having long matches, players are forced to count (or otherwise keep track of) the allowed number of actions; this is tedious. But second, this means that the action contingent is not intrinsic, and an observer arriving at the game could not infer from the board position how many actions a player has.

So here I want to focus on games that have been specifically designed with very long turns in mind. The following three movement protocols have this property, and they allow for long turns in intrinsic and natural ways. Also, they are protocols in the sense that they, in principle, apply to many games.

I am using the word chain to mean a maximal set of one-coloured pieces which are connected to each other. This is called a “clump” in Lines of Action, “chunk” in Wunchunk below, and “group” in many games. (But not in Go, where “group” is a looser concept, a set of stones considered as a unit.) This concept is crucial for connection games such as Hex where players win by building a chain linking certain edges. There are also many point scoring games which assign score values depending in some way on the distribution of chain sizes after game end.

The Wunchunk protocol

The player may place one stone for each chain of that player’s colour of size two or more.

The Oust protocol

The player carries out any number (including zero) of capturing moves, followed by a single non-capturing move.

The Symple protocol

The player either places a stone as a size one chain (“plant”) or extends each existing chain of the player’s colour by one stone (“grow”).

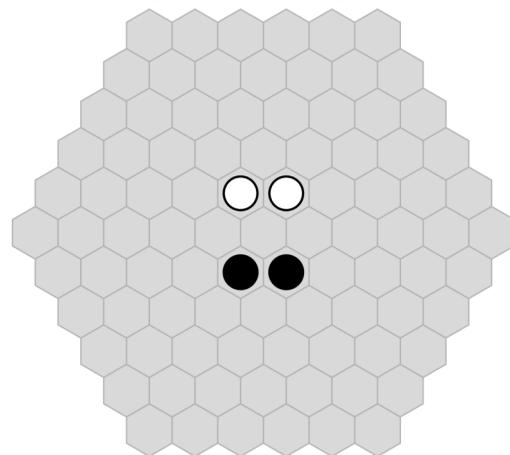
*In actual play*

An obvious question is how to carry out these turns in analogue games, i.e. without computer aid. This is not a problem at all for the Oust protocol, and easy for Symple: for growth turns, simply place auxiliary markers such as coins and replace them with actual pieces at the end. This allows for a convenient check that the proposed move is correct and desirable. This also works for the Wunchunk protocol: place auxiliary markers and before replacing them with actual stones, quickly check that their number corresponds to the number of the players’s chunks.

**Wunchunk**

Craig Duncan, 2019

The game is played on a six-sided hex board of size 6 or more with the shown initial position. Chains of two or more same-coloured stones are called chunks; each player has a chunk count at any time. On a turn, a player places at most chunk-count many stones on empty hexes; placing no stones is allowed and a pass. Each stone placed can be of either colour. The game ends when both players pass in succession or when the board is full. The winner is the player with the smaller chunk count. If these are equal, then the fewer number of smallest chains wins. This is checked recursively: first the number of singletons is compared; if equal, the number of size two chains is compared, etc. Black goes first and the pie rule is used.



*Immediate comments*

The Oust protocol is certainly inspired by Dots & Boxes, a perennial application of squared paper in classrooms. In the latter game, closing (“capturing”) one square allows (and forces) another move. For example, Mark Steere’s Flume (2010) is

another board game strongly related to Dots & Boxes. I have chosen Oust because it is a placement game with capture (making the protocol more universal) and it is an elimination game starting on an empty board, which is quite unusual.

The Wunchunk and Symple protocols generate actions depending on the number of chains of the active player. The differences are: (a) placement is free in Wunchunk and restricted to growing chains in Symple (the latter is a very natural restriction), and (b) when counting actions, Wunchunk disregards single-stone chains. There are a lot of possible variations but I believe these two protocols give a good impression of what I mean by “long turns,” “intrinsic,” and “natural.”

Clearly, Wunchunk is driven by the tension between building many chunks, which allows for strong turns, yet the win goes to the smaller number of chunks. The rules of Wunchunk allow the placement of stones of either colour; this is a design decision independent of the movement protocol. By the way, the game is designed for up to four players.

### Oust

(Previously called Hex Oust, this is the designer’s official version, Mark Steere, 2007)

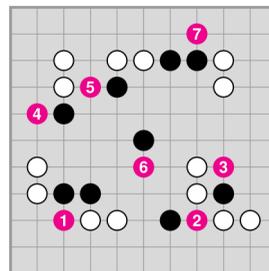
The game is played on a six-sided hexagonal board, initially empty. Players take turns placing at least one stone of their colour on an empty hexagon. There are two types of placement:

- *Silent*: the new stone is not adjacent to any like-coloured stone.
- *Capture*: the new stone is adjacent to like-coloured stones. This is only allowed if (a) the resulting chain is adjacent to at least one opposing chain and (b) is larger than all adjacent opposing chains. In this case, all adjacent opposing chains are removed.

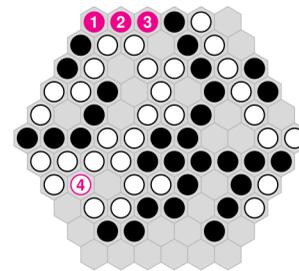
Each capture placement has to be followed by a further placement until the player finally makes a silent placement. A player unable to place a stone has to pass (and in this situation the opponent will be able to make a move). A player wins by removing all opposing stones from the board.

The rules of Symple are given opposite. For both Wunchunk and Symple, the movement protocol is largely independent of the chain-scoring win condition. And indeed, Christian Freeling later designed the connection game Scware and the territory-scoring game Sygo on the Symple protocol. Actually, Phalanx is another territorial game by the same author combining a grow-or-move extension of the Symple protocol with Epaminondas-style captures. Benedikt Rosenau applied the Symple protocol to Hex with no other changes except also replacing the swap rule by Symple’s balancing mechanic, giving rise to Symple Hex. With Itsy, Stephen Tavener twisted the Symple protocol to make a first-capture variant of Go. And while less universal than the other two protocols, the Oust core concept can certainly be used in other games. At the top of the next column are three examples for turns in these games.

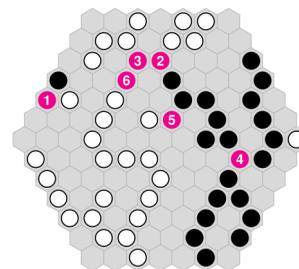
It is worthwhile to point out at that Symple and Oust are very *cold* games. This means that *zugzwang*, i.e., the compulsion to make a legal move, comes up in almost every match, and has to be part of a player’s reasoning from early on. However, while *zugzwang* is indispensable to Oust, allowing passing in Symple still would give a reasonable game, in my opinion. In fact, the two designers of Symple themselves disagreed on this point.



Symple:  
Black grows 7 chains.



Wunchunk:  
Black is about to win.



Oust: Black captures all white stones.



### Symple, the game

Christian Freeling regards Symple as one of his major achievements, along with Grand Chess, Dameo, Emergo, Sygo, and Storisende. Symple can be played online at [mindsports.nl](http://mindsports.nl) and against Stephen Tavener’s AiAi program; either option also conveniently keeps track of scores.

### Symple

Christian Freeling & Benedikt Rosenau, 2010

The game is played on a square board, initially empty. Before game start, players agree on an integer value P. White goes first. On a turn, a player must either

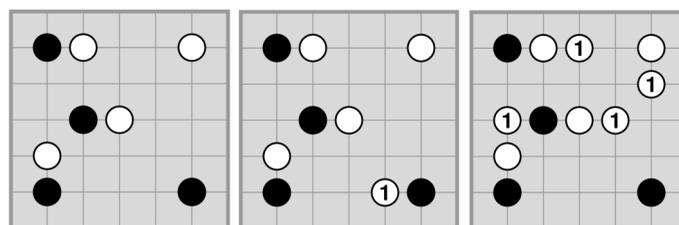
- *plant*: place a stone on a vacant point having no adjacent stones of the same colour, or
- *grow*: extend each chain of the player’s colour by exactly one stone, if possible.

As long as no player has grown yet, Black may first grow and then plant in a single turn.

The game ends if the board is full. At that point, the score of each player is the number of stones placed minus P points for each chain of that player’s colour. The winner is the player with the higher score.

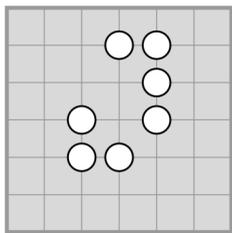
### Diagrams explaining the rules

Symple is eminently scalable, and diagrams will use 7 × 7 boards.

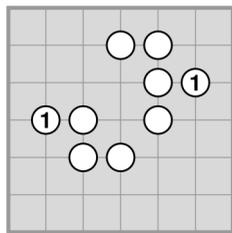


White to play: Either plant one stone... or grow each chain.

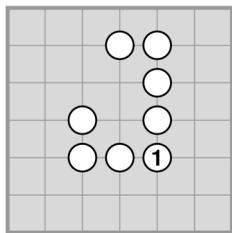
The next set of diagrams show valid growth moves for the two white chains shown. Note that in the bottom right diagram, each of the new stones extends just one chain of the starting diagram.



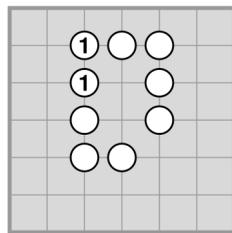
White to grow.



Separate growth.



Unification.



Touching unification.

### The meaning of the penalty P

The rules do not specify the chain penalty for scoring. I do not like keeping players in the dark about such options when they want to try out a game, so here are defaults which work well:

9 × 9 board / P = 4, 13 × 13 board / P = 6, 19 × 19 board: P = 10

The designers consider the choice of P as part of the game. On odd-sized boards, even numbered P prevents draws. As so often, it is interesting to ponder extreme cases on an N × N board:

- P = 0: In this case, the goal is to maximize stone count at the end of the game.
- P = N<sup>2</sup>: Win by smaller number of chains; equality is broken by number of stones.
- P = -N<sup>2</sup>: Win by larger number of chains; equality is broken by number of stones.

Curiously, none of these extreme variants leads to degenerate, entirely trivial games. Without going into details, this follows from the plant/grow protocol, cutting, and connections, and the resulting cold phase (if P ≠ 0). That forebodes well for the real game with modest penalties!

It is even more curious to compare Symple with Weiqi (Go) scoring in ancient China: they used to add up surrounded points and count prisoners—as in modern Japanese scoring. However, a player would hand two prisoners to the opponent for each group. This is very similar to Symple scoring with a penalty P = 2! (There is a minor distinction in that Go groups are not the same thing as chains.) Clearly, these two stones represent the two eyes a group needs to live.

### Plant vs. grow

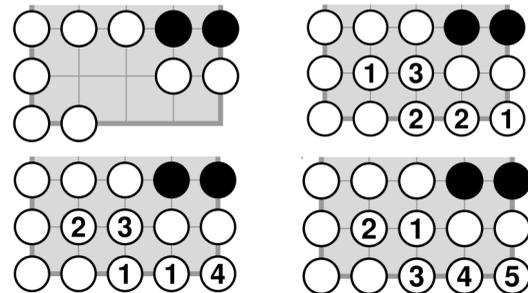
In Symple, the goal is to get as many stones on the board as possible in as few chains as possible. This dilemma carries the game to a large extent: having more chains is good for further growth, hence points, but it becomes a liability due to the score

penalty for each chain. Because players have to move, running out of growth options means that a player is forced to plant inside an opposing territory. The new stone may not out-grow the chain penalty, and thus incur a loss. Therefore, most matches have a *cold phase*, where players try to delay or avoid negative moves. This leads to a nuanced middle game. Roughly speaking, Symple games proceed like this:

1. Opening: planting moves exclusively.
2. Midgame: from first growth until territories are traced out  
Border battles and invasions.
3. Endgame: territory filling and connections. Cold phase.

### Growth order matters

It can happen that a particular choice of growth prevents another chain from growing. For example, White can fill the corner area in three, four or five turns. Filling a region as slowly as possible can be important, especially in a localized shape such as this: during a cold phase both players strive to avoid having to plant a new stone in an opposing territory.



The slowest approach is to connect as early as possible. In a bigger position, matters are more subtle: regarding points on the whole board, delayed connections are preferable.

### Second mover compensation

Black has the privilege of growing and planting, but only if neither player has grown before. This is a compensation for going second, and creates some tension in its own right: in principle, both sides want to delay growth and start planting. But if White does that for too long, then Black will carry out the double action. This provides incentive for White to grow sooner than otherwise intended, which in turn does the same for Black!

As an example, it is not a good idea for Black to use the double action privilege on turn 2. By doing so, Black has placed one more stone but now White can plant without having to worry about a later grow and plant by Black.

### Optimizing agriculture

Now focus on the stone-maximizing part. Obviously, any optimal procedure would start with planting a number of stones, and then keep on growing.

So assume starting with *n* turns planting stones, followed by *m* turns of growing. This leads to *n(m + 1)* stones after *n + m* turns. Also assume that play takes place on a 13 × 13 board and the goal is to reach at least 80 stones, which is roughly half of it. Here are some possibilities:

At least 17 turns are necessary to stake out 80 points, and there are three possibilities for this planting, 8, 9 or 10 turns, before switching to growth. It seems reasonable that nearby values, such

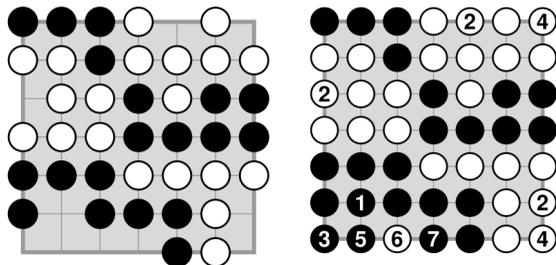
as planting for 7, 11 or 12 turns should also be relevant for good play. All of this supposes that the chains can grow enough—early on, this should be a valid assumption although it is possible to play a close-contact game right away, forcing earlier growth moves than in spaced-out, large-scale openings.

first plant:	n	4	5	6	7	8	9	10	11	12	13	14	15	16
then grow:	m	19	15	13	11	9	8	7	7	6	6	5	5	4
stones placed:	n(m+1)	80	80	84	84	80	81	80	88	84	91	84	90	80
total turns:	n+m	23	20	19	18	17	17	17	18	18	19	19	20	20

Analysis of an endgame position

Let us look closely at a Symple endgame position. This will exhibit the following concepts, although on a tiny scale: *cold phase*, *invasions*, *defensive planting*. The combinatorial complexity becomes enormous for more open positions, and one has to rely on heuristics.

In analysing this position, start with the most naïve approach: both sides just keep growing. In the next step, one has to consider invasions (offensive plantings), counter-invasions, and defensive moves (both growth and planting). This holds for endgame positions. As usual for board games, the opening and middle game are less scripted.

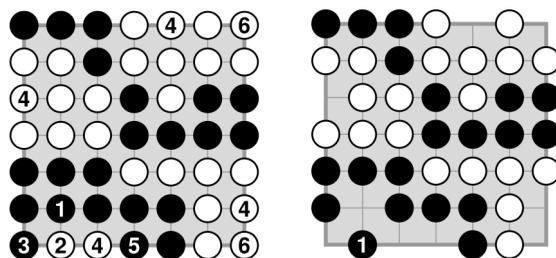


Consider the position above left: Black to play, P=4. Chain sizes: 7 + 7 + 6 = 20 for White and 4 + 7 + 8 = 19 for Black.

There are precisely three chains of each colour which cannot connect anywhere. Moreover, both sides enclose 5 points in their areas, but—and this is an important difference—these make up a single black territory while they are distributed over three white areas.

The first and most straight-forward case to test is where Black and White just keep growing, above right. However, with 5, White has lost the cold war and is forced to plant 6 inside Black's lower left area. The game is won by Black:

Black: 23 - 3 · 4 = 11 points,  
White: 26 - 4 · 4 = 10 points.



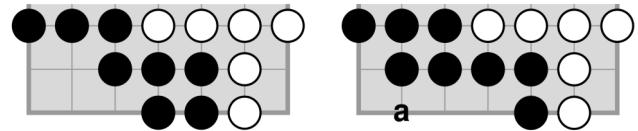
So White must do better. Suppose Black grows and White invades immediately, above left. Since White is forced to plant inside Black's territory anyway, it is best to do it immediately and make the invading chain as large as possible. This secures a one point win for White:

Black: 22 - 3 · 4 = 10 points,  
White: 27 - 4 · 4 = 11 points.

Instead of 2, White can also invade on the point to its right.

Black's correct move is defensive planting, above right. Therefore, in the original position 1 should be planted inside the Black territory. Now White will not be able to grow the invading stone, and hence lose. It is left to the reader to check what happens if White keeps on planting inside Black's corner.

In an actual game, on a bigger board, it depends on overall circumstances when a defensive planting move like 1 is appropriate. Consider the diagram below left.



This solution hinges on the shape of Black's lower left corner. With the 5 point area shown here, no black placement can prevent White's invasion and subsequent growth. In this position, Black will lose, assuming that White plays optimally.

If the lower left region had a more favourable shape, above right then a growth move at a, above right, would have sufficed. This indicates that early defensive growths can prove very beneficial in the long run: aim for flat, linear regions rather than compact, square-shaped ones.

Conclusion

Hopefully I could convince you that discussing movement protocols in general, and Symple in particular, is worth your time. Needless to say, this article only scratches the surface. Much more could and should be said, and also about so many other games. Perhaps you may want to scrutinize a game of your liking! ■



© Princess Soubise playing *peg solitaire*, 1687, by Claude-Auguste Bery. (See *BoxOff* article, page 35.)



# A first look at Push Fight Theory

by David Stoner

**P**ush Fight is an excellent modern abstract designed by Brett Picotte in 1980. Somewhere between Arimaa and Abalone, it is a game which manages to generate considerable intrigue from a very simple set of rules. In this piece we will explore some of the basic tactical patterns and strategic principles in the game.

## Rules

Push Fight is played on an irregularly shaped square grid, as pictured below. Along the top and bottom edges of the board are placed *siderails*, which are shown as thickened lines in the diagrams. Each player owns three square pieces and two circular pieces of her own colour. There is also a neutral piece, called the *anchor*, which can rest on the square-shaped pieces.

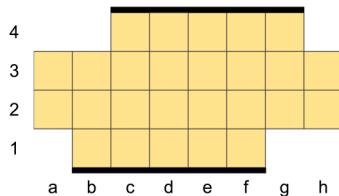


Diagram 1: Game board

Initially, the board is empty. Blue (often White in physical sets) begins by placing her five pieces on the left half of the board (columns a through d) however she likes. Then, Green (often Black in physical sets) does the same with the right half of the board (columns e through h).

After the initial setup, each turn consists of the following two phases, in order:

1) Movement: Up to two times, a player may move one of their pieces. A move consists of a player selecting one of her five pieces, and sliding that piece to an orthogonally adjacent empty square any number of times. Note that movement is optional: a player can move 0, 1, or 2 pieces in any given turn.

2) Push: To end the turn, a player must execute a push with one of her three squares. Pushes can only be executed by squares and can only be done in the four cardinal directions. A push is possible if:

- The immediate neighbour of the chosen square in the chosen direction is nonempty, and
- The line of pieces immediately in that direction terminates either in an empty space or a space off the board, and none of the pieces in that line hold the anchor.

Once the push has been made, the player moves the anchor onto the square which executed the push.

In particular, it is not possible to make a push which would send a piece through the siderail. Diagram 2 below demonstrates legal moves and pushes. Diagram 2a shows all legal moves of the d2 square. In Diagram 2b, Blue's d3 piece could push to the left or to the right, but not up (because of the siderail) nor down (because of the anchor). The result of a rightward push is shown in Diagram 2c

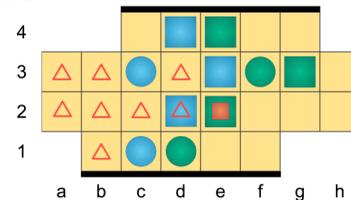


Diagram 2a: All legal moves of the d2 square.

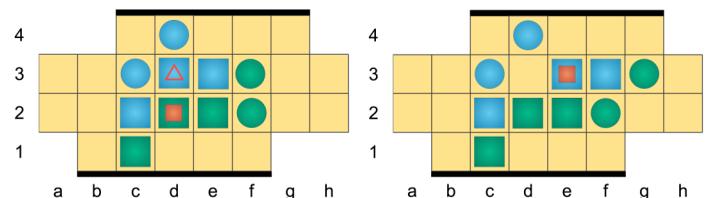


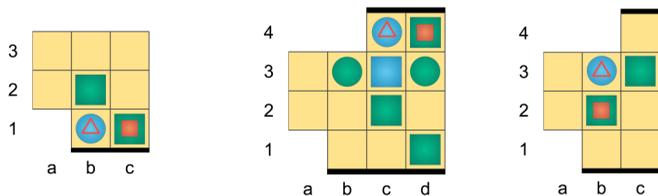
Diagram 2b: The d3 square can push left or right, not up or down. Diagram 2c: Result after the d3 square pushes to the right.

The first player to have one of their pieces pushed off the edge loses, and the other player is declared the winner.

A quick note on terminology: we call the squares b1, g4 the *strong corners* and c4, f1 the *weak corners*. The strategic distinction between the two will be examined later. Also, one advantage of the anchor mechanics is that it is easy to tell which side has the move in a given position. Namely, it is Blue to play if Green has the anchor, and vice versa.

## Traps

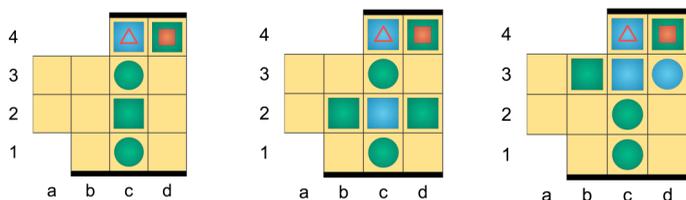
*Traps* in Push Fight are the equivalent of mating patterns in Chess. They are arrangements of pieces which signal unavoidable doom for the opponent. This game's sole win condition is pushing an opponent's piece off the edge, so recognizing these traps (and avoiding falling into them!) is essential to playing the game well. Since circles cannot execute pushes, they are more vulnerable to being trapped. Below are pictured several common examples of circle traps.



Diagrams 3a, 3b, 3c: First, second, third circle traps.

In Diagrams 3a and 3b, the marked blue circle cannot move, and a loss in the following turn is inevitable. In Diagram 3c, the blue circle can move, but none of the three available squares are safe. Note that circles can be trapped in both strong and weak corners, as well as along both the left and right edges.

Squares are more resilient, but they can also be trapped under certain conditions. In particular, squares are susceptible in the weak corners, c4 and f1. This is demonstrated below:



Diagrams 4a, 4b, 4c: First, second, third square traps.

In all three diagrams, the marked blue square is doomed to be pushed off in the following turn. The siderail is instrumental in this setup; without it, Blue would be able to simply push downwards to get out of danger. This explains why squares can only be trapped in the weak corners.

Here are a few sample puzzles, demonstrating various kinds of game-ending traps. The solutions can be found on page 34. All puzzles are Blue to move and win in two.

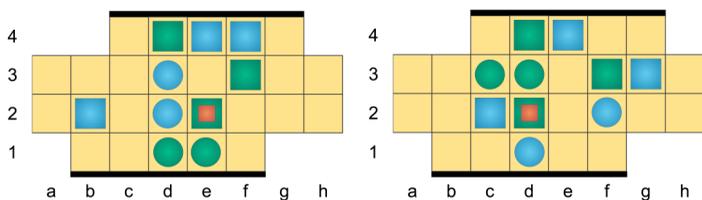


Diagram 5a: Puzzle 1

Diagram 5b: Puzzle 2

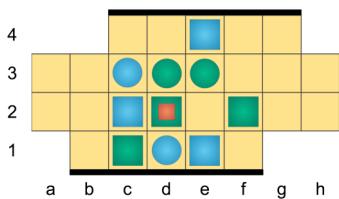


Diagram 5c: Puzzle 3

Since there are normally an enormous number of possible moves per turn, it is rarely feasible to calculate more than a move or two in advance outside of correspondence play. With that in mind, we will discuss now the essential strategic principles of Push Fight.

**Dameo Puzzle Solutions from page 3:**

Puzzle 1: ...a6d3!, 2.c3:e3 b5d3, 3.b3:d5 d3:h1, 0-2.  
 Puzzle 2: 1.f3f4! f5:f3, 2.c1b2 a2:e4, 3.g3:c7, 2-0.

**Strategy**

We start with the game's opening. Openings in Push Fight are characterized by the battle for territory. As its name suggests, a player's *territory* describes the set of board spaces which are inaccessible to any of her opponent's pieces. Expanding one's territory grants greater piece manoeuvrability and piece safety.

Since Blue has the first move, Blue also has somewhat more flexibility in the opening configuration. Green has somewhat less flexibility but does have the advantage of being able to respond to Blue's setup. Green should always place four of their five pieces along the E column in order to cede as little territory to Blue as possible.

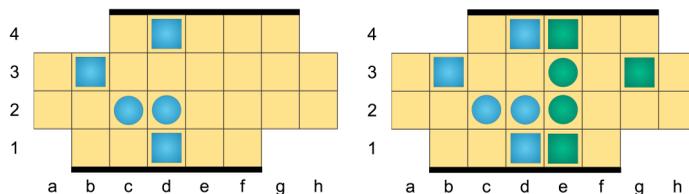


Diagram 6a: Blue's initial placement.

Diagram 6b: Green's response.

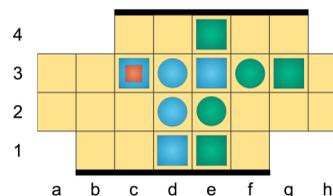


Diagram 6c: Position after Blue's first move.

The progression above shows the typical first stages of a game. Blue's setup here is among the most flexible available (and is my personal favourite!) The usual first move, as above, is 1. c2-c3, d4-d3, b3xc3. This creates a "T"-formation out of Blue's pieces. It may seem like this move is giving up territory along the fourth row, but due to the placement of the anchor there is no good way for Green to take advantage of this. Blue often plans to follow this play up with either e3xf3, breaking into Green's territory, or c3-b3, d2-c3, b3xc3 depending on Green's play.

After the initial moves, the game enters its main phase. Here players try to protect their own pieces while targeting their opponent's. Since circles cannot push, they become very vulnerable when they are separated from all squares of their colour, especially away from the centre of the board. The diagrams below show how this can even happen early on in a game. Here, Blue overextended herself in the opening; Green takes full advantage of this and takes a circle hostage. There is nothing Blue can do to save her e1 circle.

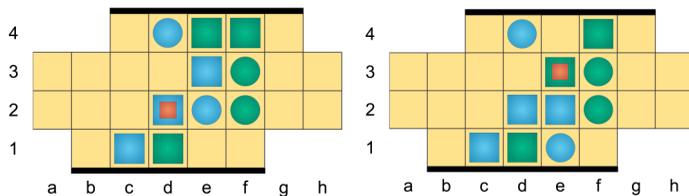


Diagram 7a: Blue has overextended in the opening.

Diagram 7b: Green takes a circle hostage.

Because of the vulnerability of circles, a good rule of thumb is to try to position friendly squares between circles and the closest edge of the board. Squares in this position can make formidable defenders, as shown below. In Diagram 8a, Green cannot avoid losing her circle (and with it, the game) on the following turn. In Diagram 8b, however, Green is doing completely fine since the g4 square acts as an effective defender to the f4 circle.

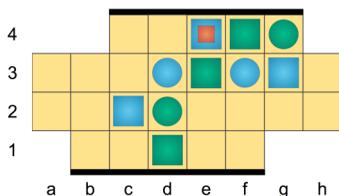


Diagram 8a: Green's circle is in danger.

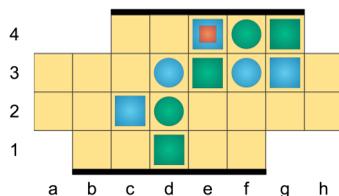


Diagram 8b: Green's circle is safe.

Finally, we touch briefly on the subject of making threats. There is an oft-repeated quote from Chess, originally by Bobby Fischer, "Patzer sees a check, Patzer gives a check." It describes the tendency of newer players to make threats blindly for no good reason. In Push Fight, too, it is not always a good idea to make a threat, as we will see.

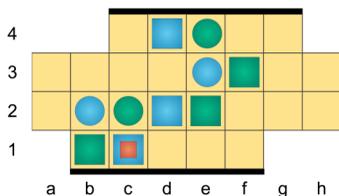


Diagram 9a: Blue makes an ineffectual threat.

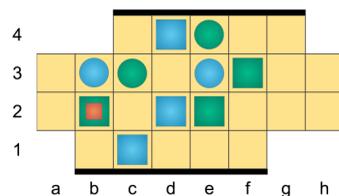


Diagram 9b: Green makes an effective counter-threat!

The diagrams above demonstrate an extreme example of this. Blue threatens Green's square, and Green responds by forming a winning trap on Blue's circle with c2-c3, b1xb2!

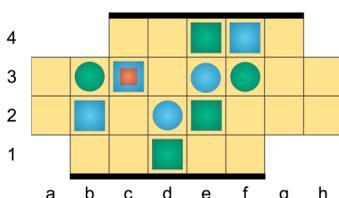


Diagram 10a: The "Sully Trap."

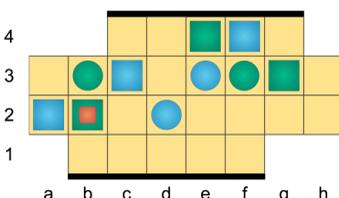


Diagram 10b: Position after e2-g3, d1-c2, c2xb2.

The above demonstrates the "Sully Trap," coined by Jesse Sullivan. It is often an option when one player leaves an unanchored square on either b2 or g3. After Green's move (e2-g3, d1-c2, c2xb2), Blue will need to spend her next two pushes escaping with the a2 square via a3-b3-c3 or a3-b3-b2. In the meantime, Green can make two pushes to capture Blue's f4 square and win the game.

This ends our short foray into Push Fight tactics and strategy. There's still quite a lot yet to be discovered about the game, and I am certainly learning new things with each play. I highly recommend fans of push-based abstracts to try this one. ■

Header image: © A Sumo wrestler performing a bow dance at the end of the day (Kuniaki II Utagawa, 1877).

David Stoner is an abstract game designer and enthusiast from the American Southeast. Push Fight is among his favourite modern abstracts, and he's currently working to develop better bots and opening theory for the game. David is a graduate student pursuing a PhD in mathematics at Stanford University.

In my review of Push Fight in AG18, I mentioned that there were few push games, in my experience, except Push Fight and Shōbu, which we reviewed, and Abalone and Siam. That comment elicited some response, which I have reproduced below. Many thanks to these people for their feedback! Replying to Chris Huntoon's question below, yes, the Unequal Board Spaces Game Design Competition is still a possibility. I'll let you know by AG20. ~Ed.

Just wanted to chime in on the article "Two Pushing Games: Shōbu and Push Fight" in AG18. I found two (maybe three) examples of other push games. The first one is Oshi, by Tyler Bielman and published in 2006, where the goal is to push seven points worth of the opponent's game pieces off the board. It twists the formula a little bit by introducing differentiated pieces (three types that have a different number of spaces they can move, the maximum number of pieces they can push and the number of points they are worth if pushed off the board). If we consider non-combinatorial games in the mix, there is also Epigo, by Chris Gosselin and Chris Kreuter, published in 2011, where the goal is to push three of the opponents' eight pieces off the edge of the board (where the game is for 2 to 4 players). Epigo has a simultaneous action selection phase and movement programming (you select which three of your pieces and how they will move in each round) as mechanisms. I think it is also worth mentioning Arimaa, by Aamir and Omar Syed (2002), where pieces can push (and also pull) weaker pieces to the four trap squares. Elimination is not the primary goal, which is reaching the opposite side with one of your Rabbits, although elimination is a secondary goal, by eliminating all of your opponent's Rabbits, thus making it impossible for the opponent to win. I also wanted to say thank you for reviving the magazine, it's been a joy reading articles focused on abstract games. ~Pablo Schulman

First off, let me say it is good to see you publishing. I appreciate the diverse range of games, as well as the detailed analysis.

Second, in AG18, in your article on push games, you asked readers to name other push games. Well one of my web-published games, Aries, is a push game. Though when I first conceived it, I didn't think of it as a "push" game, but rather as a "ramming" game. Which is why the pieces are called "Rams." Besides eliminating opponent's pieces by knocking them off the edge of the board, a player can also capture enemy pieces by shoving them into a friendly piece.

Third, any plans on carrying through with that "Unequal Board Spaces Game Design" competition you mentioned in AG17? Because I have another web-published game, Andalusia, which would fit that perfectly.

Both push games and games with unequal board spaces are very rare types of games, with only a handful of each in existence. It is nice that you are giving them some attention. ~Chris Huntoon

Concerning push games, there's Kuba variously known by other names including Traboulet. You can play on boardspace.net. Another game which looks similar is Push on BoardGameGeek, but I haven't yet acquired a copy. ~Dave Dyer



# Ed Ginsberg's Super Chess

... a retrospective

by Kerry Handscorn

Chess variants abound. David Pritchard's *The Encyclopedia of Chess Variants* (Games & Puzzles Publications, 1994) describes well over 1,000. A common theme that has attracted the attention even of world champion Chess players over the years is the extension of the orthodox game by increasing the size of the board to 10x8 or 10x10 with the addition of new pieces. The goal is often to overcome perceived deficiencies of the standard game, such as the prevalence of draws among high-ranked players.

Given that the Queen is a combination of Rook and Bishop (R+B), obvious choices for new pieces are to take the Knight's move and combine it with the power of Rook or Bishop. The 10x10 Grand Chess (Christian Freeling, 1984; *AG3 and others*) does just this, with the Marshall (R+N) and Cardinal (B+N). Grand Chess has antecedents utilizing just this solution going back centuries, including Carrera's Chess (Pietro Carrera, 1617), Bird's Chess (Henry Edward Bird, 1874), and Capablanca Chess (Jose Raul Capablanca, 1920's)—see David Pritchard's book. Gothic Chess (Ed Trice, 2000) is a more recent chess variant that uses R+N and B+N.

Other 10x10 chess variants have kept the basic chess army, although supplemented with quite different pieces. Omega Chess (Daniel MacDonald, 1992, *AG8*) is notable in this regard, with Champion and Wizard. Actually, the Omega Chess board contains 104 squares, with the addition of an extra square diagonally attached to each corner. The Wizards, with extended Knight's moves, start in these additional squares. The Champions can jump two squares in any direction or step one square orthogonally.



The new Super Chess pieces compared with a Pawn.

Grand Chess and Omega Chess stand out from many of their competitors because they were commercially produced games that attracted a following. Super Chess (Ed Ginsberg, 1976) is another large chess variant that was commercially produced. Super Chess, too, is played on a 10x10 board and retains the complete army of

standard Chess. The two new pieces in Super Chess, the Cyclops and Archer, are not so powerful as the Marshall or Cardinal, but they are more unusual even than the Wizard or Champion of Omega Chess. In addition, two of the Pawns of Super Chess are replaced with more powerful foot soldiers called Super Pawns, or Deacons. Like Grand Chess and Omega Chess, Super Chess attracted a body of enthusiastic players, at least for a while.



Ed Ginsberg gives a Super Chess set to Anatoly Karpov.

The Super Chess opening setup is somewhat variable, in that the Deacons can be placed on any of the second row squares among the Pawns, and the Cyclops can face in any direction—the orientation of the Cyclops determines its move. The different opening setups make it more difficult for one player to gain an advantage through memorization of opening sequences, although the variability is not so extreme that one has to start from scratch every game when thinking about the opening. Moreover, the Cyclops and Archer both give rise to unusual tactics. Indeed, as we will show below, the Cyclops and Archer are ideally suited to breaking down positions to reach the enemy King. Perhaps it is this feature of Super Chess that has led to the very low proportion of draws among recorded games. As mentioned above, Cyclops and Archer are less powerful than their Grand Chess equivalents, Marshal and Cardinal. Moreover, the Super Chess Rooks can be slower to enter the fray than in Grand Chess. These two factors mean that Super Chess has less of a “wild” feeling than is sometimes the case with Grand Chess—although I know that Christian Freeling was very deliberate in designing the powerful

Grand Chess army, with its highly mobile Rooks. In addition, the Super Chess Pawns start on the second rank and retain the move from standard Chess, unlike in Grand Chess, whose Pawns start on the third rank, and unlike in Omega Chess, whose Pawns can move three squares forward initially. The Super Chess forces are thus slower to engage than either in Grand Chess or in Omega Chess. Nevertheless, the additional powers of the Deacons offer some flexibility and focus in the opening.

The *eccentricity* of games might refer to features of games that are creatively different and unusual. Rodney Frederickson's games *Zhadu* (*AG11*, *AG17*), *Qyshinsu*, and *Karvilaj* all exhibit high levels of eccentricity, which is one of the reasons I like them. The Onyx board design (*AG4* and others) might well be described as eccentric, and the same is true of the Push Fight board (*AG18* and this issue). Eccentricity implies uncommon or even completely original ludemes (see the interview with Cameron Browne in *AG17*). The Cyclops and Archer are certainly more eccentric than the Marshall and Cardinal of Grand Chess, and perhaps this is a good thing.

The variability of the Super Chess opening and the eccentric powers of Cyclops and Archer ensure that Super Chess stands out among the 10x10 chess variants that extend regular Chess. I do not claim that Super Chess is better than the other 10x10 chess variants, merely that it has its own unique character and that it is worthy of comparison with the finest of the genre.

Ed Ginsberg first developed Super Chess in 1976. His wife sculpted the new pieces, Cyclops and Archer, and in 1981 Ed's company, Super Chess Inc., produced 10,000 sets. He introduced Super Chess to kNights of the Square Table (NOST), a prominent society for the play of abstract games by correspondence, and went to Chess tournaments to give sets to highly ranked players. The photograph above, for example, shows Ed giving a Super Chess set to former Chess World Champion Anatoly Karpov, in New York in 1990. After Karpov spoke supportively of the game in the mid-1980's, 3,000 sets were sold in the old Soviet Union, alone. Super Chess underwent extensive testing, with more than 1,500 games played, and it was among *Games* magazine's top-ten strategy games for 1987. After the game caught on, Ed offered a US\$1,000 prize to the winner of a Super Chess worldwide tournament played by correspondence—this was before the Internet, of course. The tournament had 64 players and it took three and a half years to complete. The final game of this tournament is annotated below.

When the 10,000 sets of the initial production run were sold, Ed did not manufacture more. Like many abstract games before and since, Super Chess fell into obscurity. However, Super Chess is historically significant among abstract games, and it is a very good game that deserves a second look.

In my presentation of Super Chess, below, much of the material comes from Ed Ginsberg's own writing on his game, although edited somewhat to fit the context of this article. Effectively, however, Ed is the co-author of this article.

## Rules

(Based on the Second Edition rules, with some edits.)

Super Chess is played on a 10x10 checkered board with a regular Chess set, with the addition on each side of one Cyclops, one Archer, and two Super Pawns, or Deacons. I will usually refer to the Super Pawns as Deacons, because then they need just a "D" for notation—and also I prefer the name! Diagram 1 gives one possible starting position. The piece represented by the eye is the Cyclops, the one-eyed creature of legend. It must always be

oriented in one of the eight directions, as shown by the arrow. The Knight with the arrow is the Archer, and the Pawns with the spiky caps are Deacons.

To set up, the players first place their pieces on the back ranks. White chooses an initial orientation for the Cyclops, and then Black orientates her Cyclops. Then White chooses two positions on the second rank to place her Deacons, and Black follows by choosing two positions on the ninth rank for her Deacons. Set up is completed by filling in the remaining positions with Pawns on the respective ranks. Allowing Black to follow White in choosing the variable set-up is designed to equalize White's advantage of the first move.

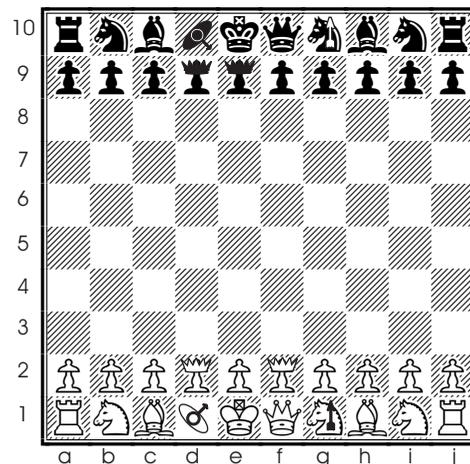


Diagram 1: Possible starting position in Super Chess.

The rules are those of orthodox Chess except for the following:

### Cyclops

The Cyclops can move one, two, or three squares in the direction of its orientation. Any enemy pieces on squares it moves over or lands on are captured, but it can move over friendly pieces without damaging them. Alternatively, the Cyclops can make a "blind retreat" up to three squares in a direction directly opposite to its orientation. In this case, however, all pieces are captured, friendly or enemy, on the squares it moves over or lands on. (When moving forward, the Cyclops cannot finish its move on a square occupied by a friendly piece, but there is nothing to stop it doing so when making a blind retreat.) After locating to its new square the Cyclops' movement is completed by choosing a new orientation, if so desired. The Cyclops can rotate to a new direction on its original square without relocating to another square, and this is counted as a complete move. Note that the Cyclops cannot simply rotate in a complete circle, effectively allowing a player to pass a turn.

The value of the Cyclops is estimated at 4 points (compared with standard values associated with Chess pieces).

### Archer

The Archer moves and captures like a Chess Knight. Alternatively, the Archer may capture without moving: an enemy piece exactly four squares from the Archer in an orthogonal direction is simply removed from play, and this counts as a complete move for the Archer. It does not matter whether there are friendly or enemy pieces interposed between the Archer and the piece it is capturing in this manner. (Note that the arrow on the Archer in the diagrams is for identification only—the Archer is not orientable like the

Cyclops.)

The value of the Archer is estimated at 4 points.

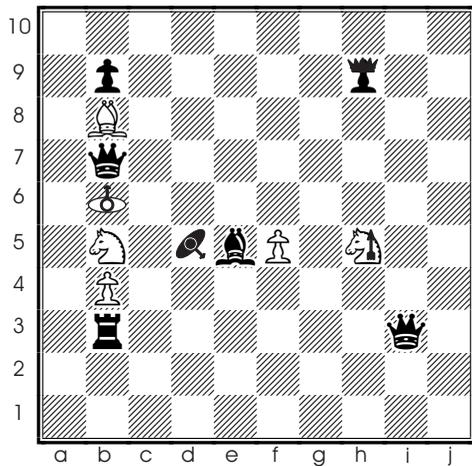


Diagram 2: Examples of Cyclops and Archer.

In Diagram 2, the white Cyclops on b6 can move to b7 capturing the black Queen; or it can move to b9, capturing the black Pawn as well as the Queen, but jumping over the white Bishop on b8. The white Cyclops could also make a “blind retreat” and capture the black Rook on b2, but in this case both the white Pawn and white Knight would also be removed from play. The white Archer on h5 can capture the Cyclops on d5 or the Deacon on h9, without moving. On the other hand, the Archer could simply move like a Knight and capture the Queen on i3.

#### Deacon

The Deacon behaves exactly like a regular Pawn, except for additional features:

- On a Deacon’s initial move of two squares directly forward, it does not matter if the first square is occupied, whether by a friendly piece or an enemy piece. Enemy pieces jumped over are not captured, and of course the square moved to must be vacant.
- A Deacon can capture on a square that is either one or two spaces away diagonally forward. When capturing two squares away, it does not matter if the first square diagonally forward is occupied, whether by a friendly piece or an enemy piece. Again, enemy pieces jumped over are not captured.

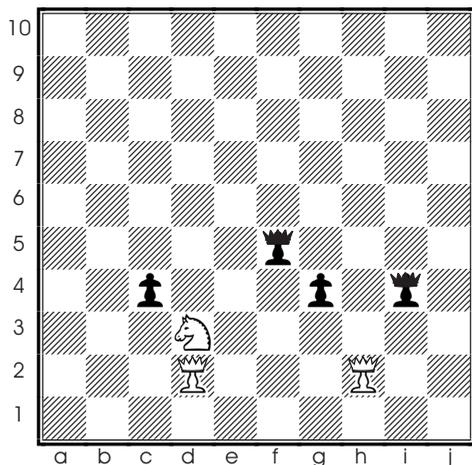


Diagram 3: Examples of en passant.

The *en passant* rules are applicable to Deacons. Thus, Deacons can capture or be captured en passant by regular Pawns or other Deacons. A Deacon can use its extra power when capturing en passant. On the other hand, if a Deacon makes a two space leap over an occupied square, then it is immune from capture by *en passant*.

In Diagram 3, if White moves the Deacon to d4, then Black cannot capture *en passant* either with the Pawn or Deacon. On the other hand, if White moves the Deacon to h4, Black can capture *en passant* with either of the two Deacons or the Pawn by moving to h3.

The value of the Deacon is estimated at 2 points.

#### Promotion

Pawns and Deacons promote upon reaching the opponent’s back rank. Promotion may be to any piece except a Pawn, Deacon, or King.

#### Castling

The regular Orthodox Chess rules of castling apply, except for some necessary clarifications: on the King’s side the King moves to the King’s Bishop position, and the Rook moves to the Cyclops position; on the Queen’s side the King moves to the Queen’s Bishop position and the Rook moves to the Archer position.

#### Strategic hints

(Based on the Chess Variants file, with some edits:

<https://www.chessvariants.com/play/erf/SuperChessRules.txt>)

Black should take some care in placing the two Deacons since that placement somewhat offsets White's advantage in moving first.

The true power of the Cyclops or the Archer will appear only after much experience, but some suggestions about strength may be made. In Chess, Knight and Bishop are considered equal and readily exchanged for each other. On the larger board of Super Chess the Bishop has greater mobility and, consequently, greater value. It should not be exchanged for a Knight without significant gain in position or other material. The Archer is somewhat more powerful than the Knight, but the full usefulness of its arrow requires that it stay near the centre of the board. For instance, King and Archer cannot mate a lone King, the Archer being no more effective in this respect than is a Knight. The Archer might be more or less valuable than a Bishop, depending upon the position.

The Cyclops is probably more powerful than a Bishop, though not as strong as a Rook. A mating position is possible for King and Cyclops against the lone King, but it cannot be reached unless the defender makes errors, unlike King and Rook which can force mate against a King. The Cyclops is valuable in crowded positions where it can make multiple captures and open lines.

Here are a few illustrations to give you an idea or two about Cyclops and Archer.

A possible starting position is shown in Diagram 1. (Remember, the Deacons can be placed differently than shown, and either Cyclops is allowed to face in some other direction.) To record the moves, C is used for Cyclops, A for Archer, and D for Deacon. In parentheses after the Cyclops move will be a compass label (NE, S, SW, etc.) to indicate the direction it faces at the end of its move. North is always the direction facing away from White, so that a black Cyclops facing directly down the board towards White is C(S), for example.

To start off, either Cyclops or Archer can mate from the starting position in three moves.

- For the Cyclops, for example, Cg4(NW)-Ce6(N)-Ce7(N)++ or Cf3(NW)-Ce4(N)-Ce7(N)++.
- For the Archer, for example, Af3-Ag5-Ae6++.

It is important to realize that these are not good ways to open play, being easily countered, but are just included to show how the pieces can be used. They do lead to a more worthwhile observation, too.

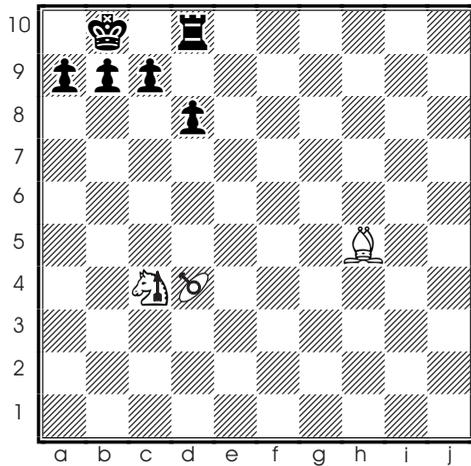


Diagram 4: The Cyclops can deliver mate.

In Chess, castling is used to get the King safely behind a wall of unmoved Pawns. Often the plan of a game is to break through that wall to reach the King. In Super Chess, the Archer can shoot over the wall and the Cyclops can crash right through it, so castling does not provide as much safety as it does in Chess. Look at the position in Diagram 4. Play proceeds, 1.Ab6+ Ka10, 2.Ca7(N)++.

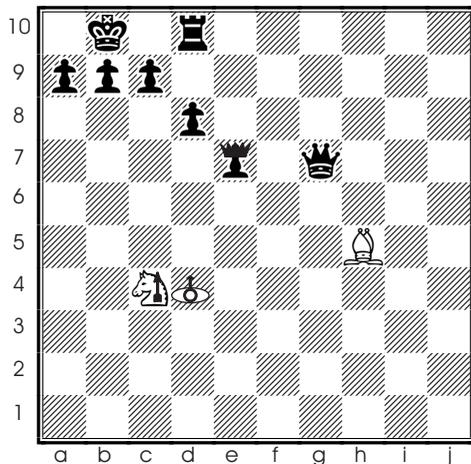


Diagram 5: White can capture the black Queen.

Diagram 5 shows a more complicated version of the same idea. This time, 1.Ab6+ Ka10, 2.Cd7(W). Black's Queen (and Deacon) is threatened, but if she moves to escape, 3.Ca7(N)++, so the Queen falls.

These examples suggest that the King in Super Chess needs more escape squares around him than he usually has in Chess.

The Knight fork is a powerful tool in a Chess player's

arsenal. The Archer, by combining that fork with arrow attacks, can be exceedingly dangerous. The position in Diagram 6 is not likely to appear in an actual game, but something like it is worth watching for. The move Ad6 places Black's Queen, Rook, Bishop, and Cyclops all under attack at once. Unless Black has strong counter-attacks, White will win at least two pieces. The Archer seems to be a good piece to save for the middle game and later. Important defensive pieces can be attacked from a distance, making it harder to maintain a good position.

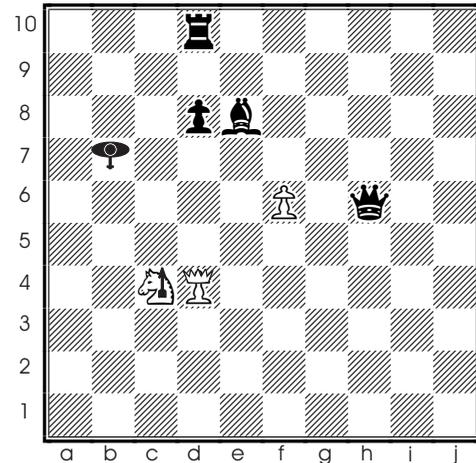


Diagram 6: The Archer can fork multiple pieces.

Diagram 7 shows a position in which the Pawn at g9 is important to Black's Pawn structure and the defence of his King. The move Ag5 leaves no hope for saving it.

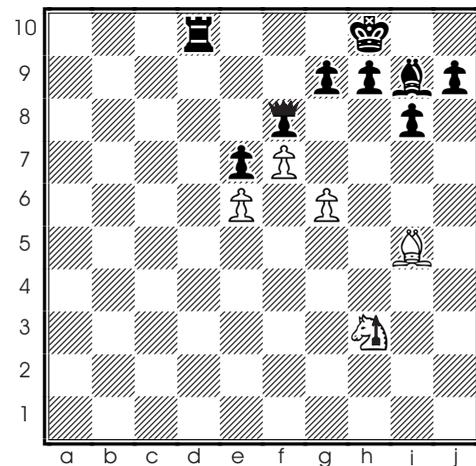


Diagram 7: White can capture the Pawn on g9.

The blind retreat of the Cyclops, which sometimes destroys one's own pieces, seems to be more of a move to avoid, but it can be used as a powerful attacking tool. It may happen that a player's pieces, especially Pawns, can block lines of attack. The Cyclops can be used to get them out of the way. In Diagram 8, White moves Cxe7xc7(N)+. While Black is getting his King out of check, White has the opportunity to take Black's Queen with the Bishop.

Diagram 9 shows a different version of the same idea. Again, White starts with a blind retreat, clearing out the two Pawns which block his attacking Rook and Bishop. 1.Cxe7xc7(N)+ Kb10, 2.Cxc9,c10(W)++. It will be interesting to see how combinations such as these come out of actual games.

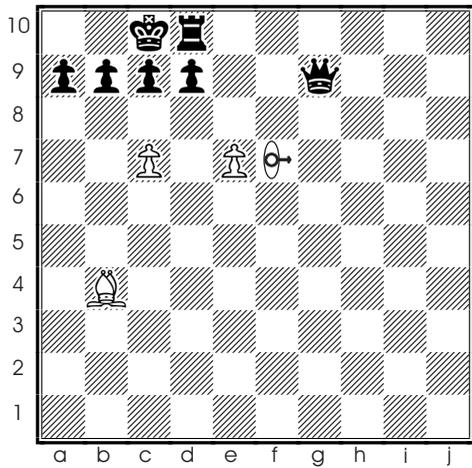


Diagram 8: The Cyclops opens lines of attack.

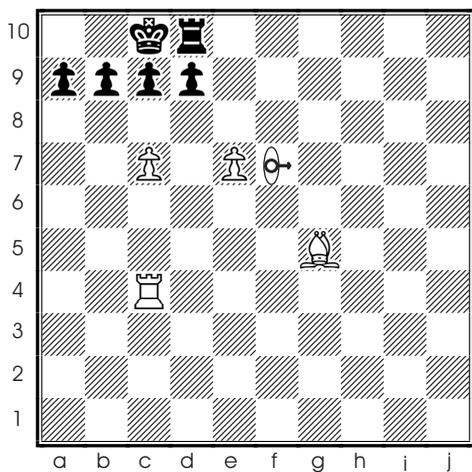


Diagram 9: The Cyclops can mate.

### Championship Final Game

The Super Chess correspondence tournament ran for three and a half years, from 1985 to 1988, as players sent moves back and forth by regular mail. Here is the annotated game of the final match for the US\$1,000 prize. Henry Schmidt from Germany played White; Henk Hellmund from the Netherlands played Black.

There are some inaccuracies in the play of the game, as you will see. Nevertheless, we reproduce it here for its historical significance in the world of chess variants, and for the way that it illustrates some tactics involving the unique Super Chess pieces, Cyclops, Archer, and Deacon. The annotations “!” and “?” are original, and any other commentary is new.

White: Henry Schmidt (Germany); Black: Henk Hellmund (Netherlands)  
 White: C(NE); Black: C(SE)  
 White: Dd2, Df2; Black: Dd9, De9 (Diagram 1)

1.Df4 De7, 2.Pe4 Nc8, 3.Nc3 Pb8, 4.Dd3 Bb9, 5.Nh3 Dd7, 6.Af3 Nh8, 7.Df5 (Diagram 10), 7....Dxf5, 8.Dxf5 Qc7? (Black brings out the Queen too early), 9.Bf4 Nd6, 10.Qd3 Ae9, 11.Nd5 Qd8, 12.Cg4(N) Pf8, 13.Pi3 De6! (Diagram 11).



Original score of the Super Chess Championship Final, 1988.

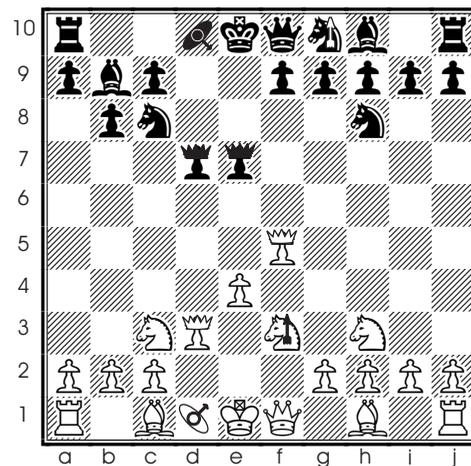


Diagram 10: Position after 7.Df5.

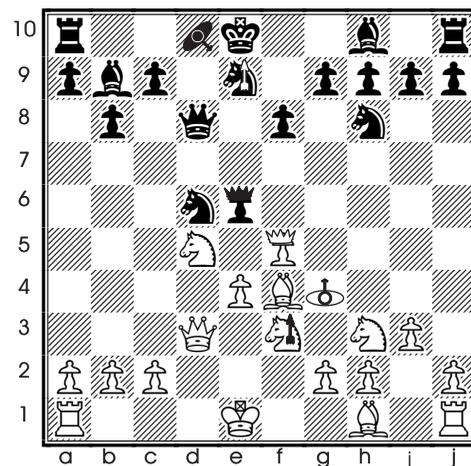


Diagram 11: Position after 13...De6!

14.Cg5(NW) Qe8, 15.Nf6 Qd9 (White continues to chase Black's Queen around), 16.Qxd6 Qxd6, 17.Bxd6 Dxf5, 18.Pxf5 Bxf5, 19.Pc3 Cg7(S), 20.Ch4(N) Cg6(W), 21.Ne8! Kd9 (Diagram 12).

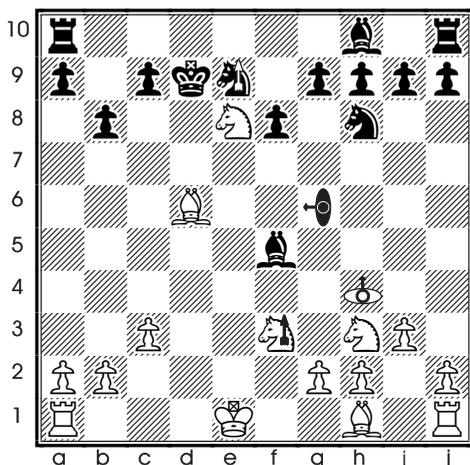


Diagram 12: Position after 21...Kd9.

22.Ch7(N)? Nf7 (So that White must use two moves, not one, to capture N and B), 23.Axf7 Kxe8, 24.Cxh9xh10(E) R(j10)xh10, 25.Bj3!! (Diagram 13—White pins the black Cyclops).

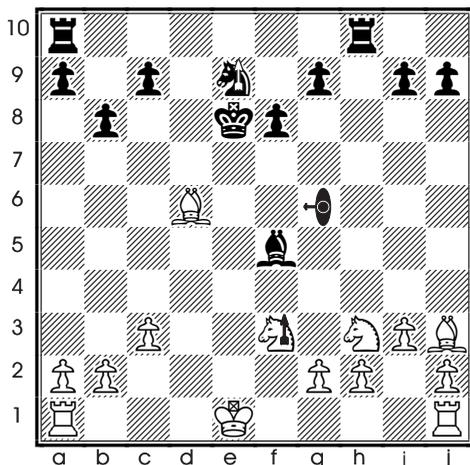


Diagram 13: Position after 25.Bj3!!

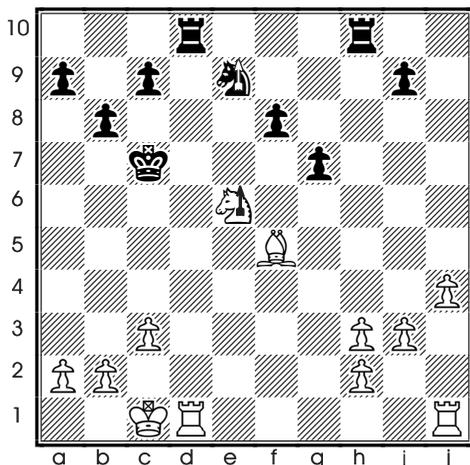


Diagram 14: Position after 33.Ae6+

25...Bxh3?, 26.Bxg6+ Kd7, 27.Pxh3 Kxd6, 28.Ag5 R(h10)g10 (Defending against Axc9), 29. 0-0+ Kc7, 30.Bxj9 Pg7, 31.Bf5 R(a10)d10, 32.Pj4 Rh10, 33.Ae6+! (Diagram 14).

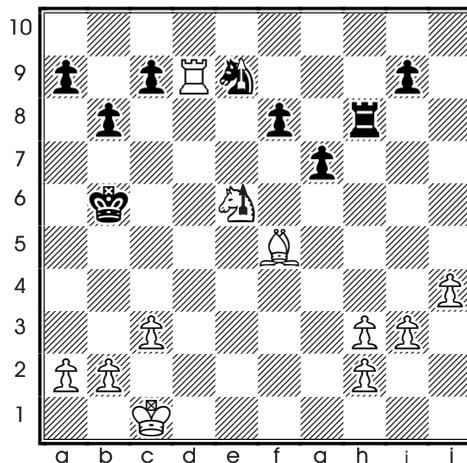


Diagram 15: Position after 36.Rd9!

33...Kb6, 34.R(j1)f1 Rxd1, 35.Rxd1 Rh8, 36.Rd9! (Diagram 15).

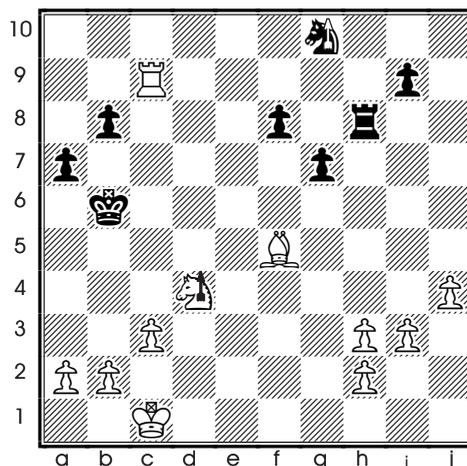


Diagram 16: Final position after 38.Ad4!

36....Ag10, 37.Rxc9 Pa7, 38.Ad4! Resigns (Diagram 16—Black has no attack, he is a Bishop and two Pawns down, and his King is in mortal danger. ■

### Acknowledgements

It was my good fortune to get a Super Chess set from NOST in 2003. I subsequently wrote the original version of this article, which would have gone into the old *AG17*. The current version of the article was produced following a number of communications with Ed Ginsberg himself, and I thank him for the permission to reproduce here some of his material about Super Chess. Over the succeeding years since 2003, my set disappeared, and for planning this article now I tried to acquire another copy. Fortunately, one of my old NOST friends, John McCallion (see the interview with Kate Jones in this issue), came through, and his friend Drew Davidson very kindly donated a Super Chess set to *Abstract Games*. Thank you very much to both John and Drew!

We would be very interested to hear from readers about other chess variants that are worthy of saving from oblivion—modern or historical. Perhaps a game that has eccentric elements...



# The Science of Play in Shatranj

## Part 1: The early game in the Islamic world

by Nikolas Axel Mellem

As we become more mature our understanding of the world grows. We become wiser, more ethical and overall better human beings. There are however two disadvantages to becoming older. First our analytical power drops; second our memory deteriorates. And if that alone was not enough, modern Chess is filled with youngsters and computers, both known for their great tactical skills and memory of sharp opening variations. Chess is no longer the game it was, but there is a solution to all of this—start playing Shatranj instead! The game is slower and more strategic, and you do not need to memorize long forced-move sequences. Just set up a Tabiyah and start to play!

Shatranj, or Chatrang, is the oldest known chess variant, with references and archeology dating back to Sixth Century Persia, and descriptions of the rules dating back to Arabic manuscripts from the Ninth Century. Because it is widely believed among chess historians that Arabic Shatranj only differed from Persian Chatrang in piece design and piece names, the game has a unique continuity of around 1500 years. No other chess variant has close to Shatranj's longevity—the modern Chinese XiangQi being closest, with its history dating from the Eleventh Century up to the present.

In this first part of the article, the main issue is to talk about the science of the game with reference to the strongest Arabic players. In the second part of the article, we will take a closer look at the rule changes in the European Middle Ages. What consequences did these rule changes have for the game? My special thanks go to H. G. Muller for adjusting his Shatranj Tablebase to rules of the European Middle Ages, and for solving the most interesting endings. The final part of this article will also deal with Shatranj and computers, and present my own games against different Shatranj engines.

The second and third parts will be presented in future issues of *Abstract Games*. The reference list for the whole series is given at the end of this first part, although direct citations are sometimes informal or even omitted.

### Shatranj pieces

The Arabic Shatranj game probably did not differ from the original Persian Chatrang that the conquering Arabs found in Persia. However, the piece design became non-figurative due to the aniconism of Islamic art, which avoids the images of sentient beings. Islamic aniconism stems in part from the prohibition of idolatry, and in part from the belief that the creation of living forms is God's prerogative. However, as pointed out by Ferlito (1994) the non-figurative piece form seemed more like a functional fashion than a religious ban. The abstract pieces were more durable, and hence popular even later in Europe.

The design we will use for the diagrams throughout our

discussion of Shatranj is shown below. It follows fairly closely the design of a traditional Arabic Shatranj set, although somewhat more stylized. The colours of each side were typically blue (or black) and red. It did not matter which colour moved first. In our presentation, Blue will have the first move.

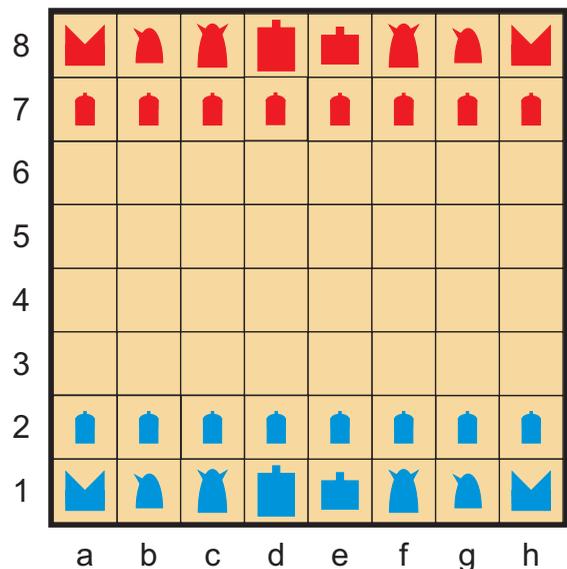


Diagram 1: Shatranj set up for beginning of game.

### Rules

The rules of Shatranj are the same as the standard Western game, with the same setup, except for the following:

- The game is won by checkmate, by capturing all opposing pieces except the enemy King, or by stalemate.
- The Bishop is replaced by the Elephant, which jumps two squares diagonally. This piece is still present in XiangQi.
- The Queen is replaced by the Fers (Advisor) that moves one square diagonally. This piece is still to be found in both Thai Makruk and XiangQi.
- The Pawn moves only one square, even on its first move. There is no *en passant*.
- When the Pawn reaches the last row, it automatically becomes a Fers. Multiple Ferses are allowed.
- There is no castling.
- Instead of the 50 move draw rule, there is a 70 move draw rule (Hooper and Whyld, 1992). In other words, a player can claim a draw if each player has made 70 moves, during which no capture has been made and no Pawn has been moved.

**The Persian heritage**

Ever since the beginning of chess, Persia played the leading role in the development of the game. After the Islamic conquest, in the period 633-651 CE, the leading Shatranj masters continued to come from the original Persian areas of what now became the Islamic Sasanian Empire—including the city of Baghdad, which was earlier the Persian capital and subsequently the residence of the Islamic Sultans. Below, we will refer to “Islamic players,” meaning that they resided in the Islamic Empire.

**Opening and middle game theory**

The Islamic players used Tabiyas—opening piece setups that varied from 8 to 22 moves, and which were more or less independent of the opponent’s moves. In the Tenth Century as-Suli and al-Lajlaj argued for the use of shorter Tabiyas and even abandoning Tabiyas altogether. Al-Lajlaj even published opening analyses stretching up to 20 moves. Modern players, of course, do not have to use a traditional Tabiya.

The skill level of the players seems to have been comparatively high, and we hear about Arabic players in the late Middle Ages playing up to 8-10 games blindfolded (Wilson, 1981; Hearst & Knott, 2009), with Sa’id bin Jubair (665-714 CE) being the first known blindfold chess player ever. In European terms, his achievements are parallel to those of Louis Paulsen and Paul Morphy of the mid-Nineteenth Century.

The Islamic players also created piece value tables and below we can see a comparison of piece-values from as-Suli, a Sixteenth Century Persian manuscript, and the modern Zillions of Games.

	as-Suli	RAS MS	ZoG
	c. 920	16th. c.	2002
Rook	5.00	5.00	5.00
Knight	3.33	3.33	2.90
Fers	1.67-1.88	2.08-2.50	1.67
K- Elephant	1.35	1.25-1.67	1.28
F-Elephant	1.25	1.25-1.67	1.28
e-Pawn	1.30	1.25	0.71
d-Pawn	1.20	1.04	0.71
b-Pawn	1.00	0.83	0.71
cgf-Pawns	0.92	0.83	0.71
ah-Pawns	0.63	0.63	0.70

Three estimates of piece values.

The Islamic players, starting with Rabrab and Abu'n Na'an, and continuing with as-Suli, had a high opinion of the central Pawns, advocating that two central Pawns, or even two random Pawns, were stronger than a single Fers. As-Suli even tells us that some of his contemporaries thought two central Pawns were stronger than a Knight. The Islamic players were also afraid of using Knights and Rooks in the opening due to the risk of these strong pieces being chased back by weaker pieces. This led them to make many

slow Pawn and Elephant moves. The following game is taken from Hesse (2007), and is played between the grand master as-Suli and the reigning Sultan al-Muqtadir.

**Yahya as-Suli vs. al-Muqtadir**

Baghdad, circa 920.

1.g3 g6, 2.g4!?! (A curious move, especially given the fact that none of the as-Suli or al-Lajlaj Tabiyahs place the g-Pawn on its second square. It reminds us of the eccentric Steinitz move in the French defence: 1.e4 e6, 2.e5!?) 2...f6, 3.e3 e6, 4.Ne2 d6, 5.Rg1 c6, 6.f3 b6, 7.f4 a6 (What al-Muqtadir is doing is placing the Pawns on the sixth row, according to the Sayayala Tabiyah, where seven Pawns move one square each. Our champion does not do much different, and as we soon will see, surprisingly, after nine moves on each side only one Knight is out and this Knight is placed on e2.) 8.f5!?! (Diagram 2)

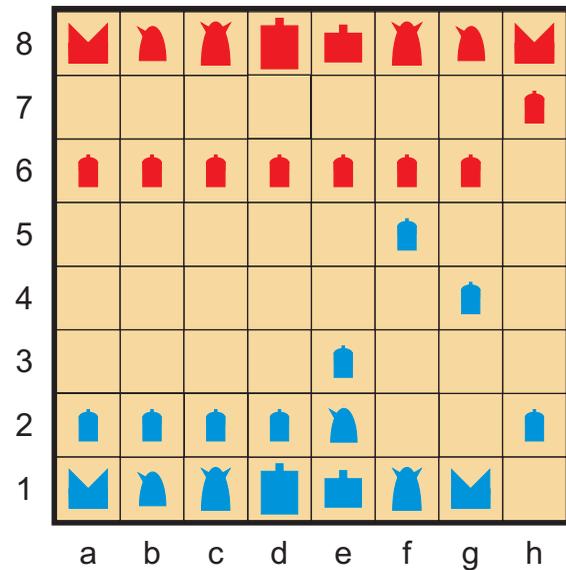


Diagram 2: Position after 8.f5!?!

8...exf5? (Red should have stayed flexible either by playing 8...Ra7, with the idea of ...Rg7 and ...gxf5, or by simply developing the Knight to d7.) 9.gxf5 gxf5?! (Red has created an ugly double Pawn. Better was 8...Ne7.) 10.Eh3 Ne7, 11.Rf1 Rg8, 12.Ng3 Rg5 13.Exf5 (Blue gets a very strong outpost for his Elephant, where it controls the important d7-square.) 13...h6, 14.Eh3? (There was no reason to retreat the Elephant and lose control over the d-square.) 14...Nd7, 15.d3 d5 (Diagram 3—As-Suli as Blue has gained a slight advantage over the Sultan thanks to Red’s weak f6-Pawn. But how shall Blue proceed?)

16.c3?! (Blue initiates static, Pawn-oriented play, not grasping the dynamics of the positions. Placing the Knight on c3 would have been better.) 16...Fc7?! (Red plays to proceed with the Fers into the centre, when the path is ready. However he misses good counter chances after 16...Ne5, 17.Rf2 Ng4 and Blue must already try to solve some problems.) 17.b3? (This however is definitely bad. Blue should have hindered the Knight coming to the e5 square with 17.d4.) 17...Ra7? (Here the Sultan misses the opportunity to seize the initiative after 17...Ne5! 18.Rxf6 Rg3.) 18.c4?! (Again those static Pawn moves!) 18...Ed6?! (Here again Red ought to play the Knight to e5 with the idea of Ng4, threatening the h2-Pawn.) 19.Nc3 Ee6, 20.cxd5 cxd5, 21.d4 (Diagram 4).

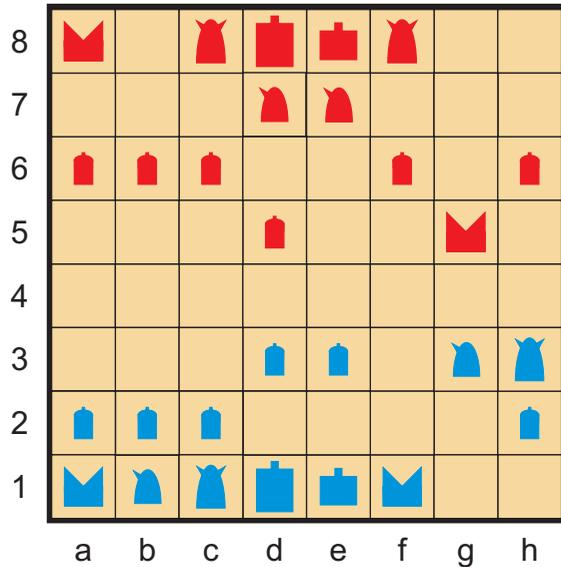


Diagram 3: Position after 15...d5.

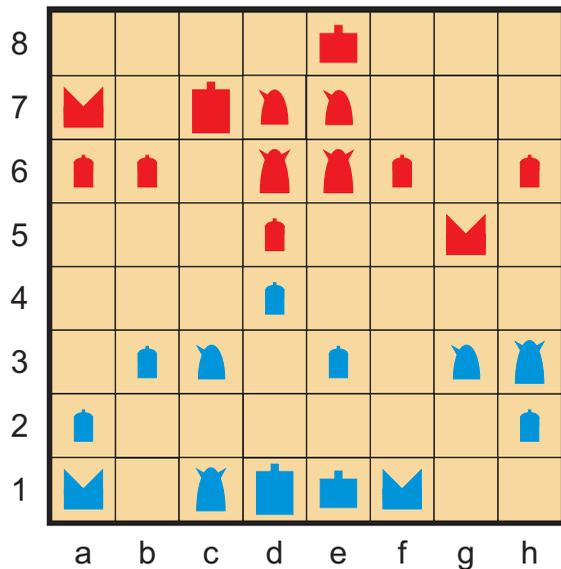


Diagram 4: Position after 21.d4.

21...Ef8? (There was no need to retreat the Elephant. Zillions of Games proposes 21...h5, with the idea of countering 22.e4 with 22...h4!) 22.Rf2 (As-Suli is still better, and after some further grave mistakes, the Sultan lost after 35 moves.)

Here it must be pointed out that prioritizing Pawn moves versus Knight moves is something that dominated the Western Chess world into the middle of the Nineteenth Century, with for instance almost exclusively closed lines in both Sicilian and French defences. 1.e4 c5, 2.Nf3 with the 3.d4 advance started slowly in the 1830's with Alexander Mc Donnel, whereas 1.e4 e6 2.d4 d5 3.Nc3 was first initiated by Louis Paulsen in the 1860's, soon to be followed by Wilhelm Steinitz.

There was also a tendency to discriminate between the different Pawns and Elephants, which the Zillion of Games engine finds faulty. Commenting on the RAS manuscript, Murray (1913) states that the manuscript overestimates the values of the Fers and Elephants. If we take the middle values (Fers 2.29 and Elephant 1.46), Murray's claim makes sense for the Fers. However, this is

true because the Fers is valued too highly compared to the Rook and Knight. The problem could have been solved by reducing the values of Pawns, and keeping the values of other pieces constant.

Both as-Suli and later al-Lajlaj argued for oppositional play, which meant blocking Pawn advances by simply mirroring the opponent's moves. The following game is taken from Gralla (2010).

**Yahya as-Suli vs. Sa'id al-Lajlaj**  
Baghdad circa 920.

1.f3 f6, 2.f4 f5, 3.Nf3 Nf6, 4.g3 g6, 5.Rg1 Rg8, 6.h3 h6, 7.e3 e6 (Diagram 5).

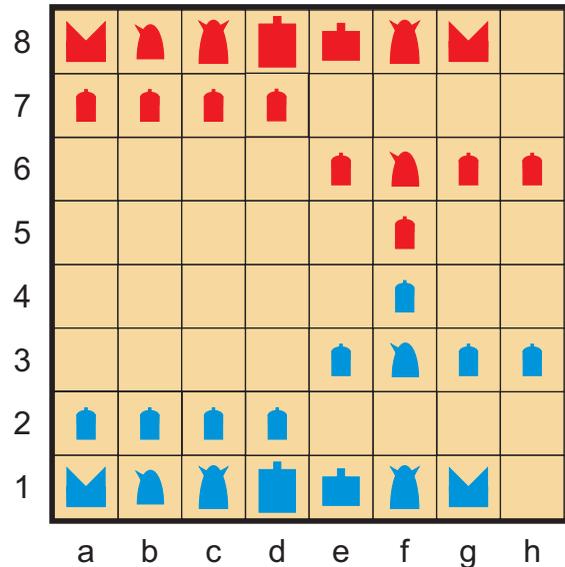


Diagram 5: Position after 7...e6.

8.g4. (We witness a broken Mujannah Tabiya, which is not completed.) 8...fxg4, 9.hxg4 g5 (An obligatory move, because Blue's 10.g5 hxg5, 11.fxg5 seemed somewhat annoying to Red.) 10.fxg5 hxg5, 11.d3 (As-Suli is setting up a central Pawn structure, aiming for the c-Elephant to keep the pressure on Red's g5-Pawn.) 11...d6, 12.e4 e5, 13.Ee3 Ee6. (Al-Lajlaj continues to mirror his more meritorious opponent. Since the piece movement in Shatranj is far slower than in most other chess variants, this strategy can be used to a far more frequent extent.) 14.Nxg5 Ke7?! (There was no reason to move the King, and 14... Exg4 was stronger.) 15.c3 (As-Suli here chooses to play with the Pawns in order to get a central breakthrough. More dynamic was 15.Nc3, followed by a transfer to the King's wing, where Blue could develop an offensive.) 15...Nxg4, 16.Ke2 c6, 17.d4 d5 (Blue is himself threatening the d4-d5 advance.) 18.b3 b6, 19. Nd2 Nd7, 20.Fc2! (Activating the Fers is an important part of the game. Arab masters were therefore careful to make way for it. Moreover, this knowledge was rarely implemented in medieval Europe, where the players neglected the Fers' role completely. Even worse was the view of the Europeans on the Elephant, where it was seen as a useless and suspicious piece that from time to time forked two stronger pieces.) 20...Fc7, 21.Fd3 Fd6 (Diagram 6).



Header image on page 23: © Two Shatranj players in a detail from a Persian miniature painting of Bayasanghori Shahname, 1430.

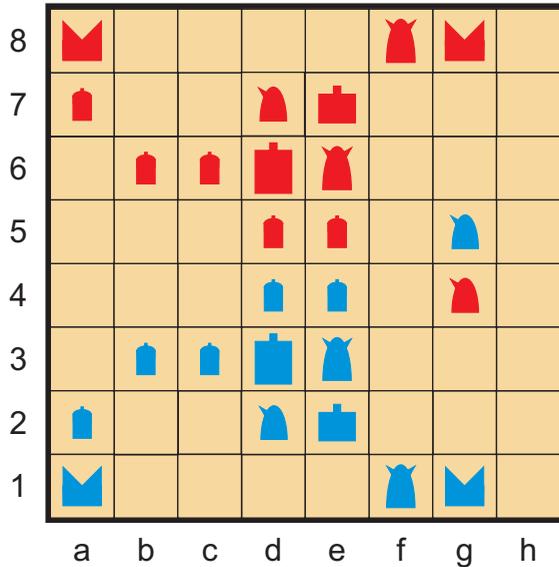


Diagram 6: Position after 21...Fd6.

(The game shows typical Fers placement in the Shatranj middle game. In the first part of the Twelfth Century, the Spanish-Jewish player Ezra introduced the d1-d3 / d8-d6 Fers jump—a rule that became accepted throughout the European continent.) 22.Ndf3 (The Knight ensures that the d4-Pawn will not hang after the future c4 advance.) 22...Ndf6, 23.Eh3 Eh6, 24.Ef5 Ef4 (Diagram 7).

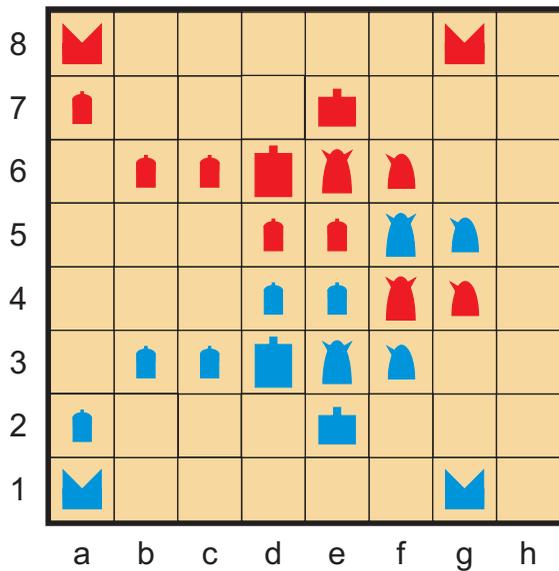


Diagram 7: Position after 24...Ef4.

25.Rac1! a6? (Red wastes a move. The positions would still be balanced after the more active 25. ... Rh8.) 26.c4! (A strong advance, and now al-Lajlaj must play precisely to stay away from trouble.) 26...Rac8? (Now the student gets into trouble. Necessary was 26... dxc4, 27.bxc4 c5, and if Blue advances with 28.d5, Red has a solid position after 28...Ec8.) 27.c5! bxc5, 28.Exc5? (A serious tactical error. As-Suli should have first driven the Fers from d6 with 28.dxe5 Nxe5, 29.Exc5 Ke8, 30.Ne6 with an advantage according to Zillions of Games.) 28...Ke8?? (Gives away the Elephant for free. With 28...Fxc5, 29.dxe5!—29.Rxc5 was far weaker—and then 29...Nxe4, 30.Fxe4 dxe4, 31.Nxe4 Fb4, Red is still fighting, with a small disadvantage, according to Zillions of Games.) 29.dxe5 Nxe5, 30.Nxe6 Rxc1, 31.Rxc1 Nxf3,

32.Kxf3 (Diagram 8—Red is lost after, for instance, 32...dxe4, 33.Fxe4 Ed2, 34.Rg7.)

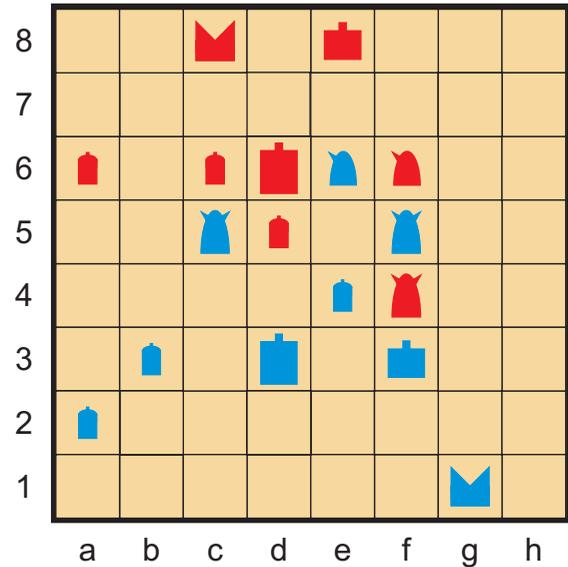
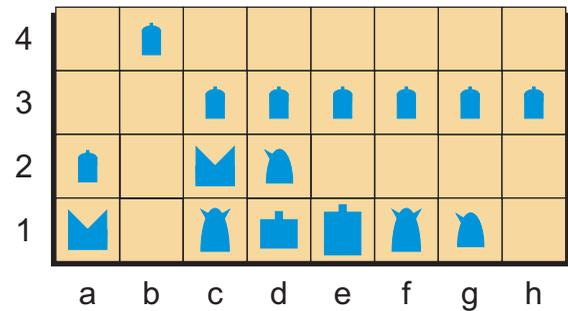


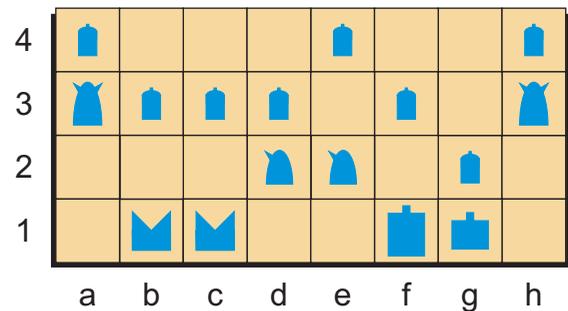
Diagram 8: Position after 32.Kxf3.

### Tabiyah development up to the sixteenth century

Did the Tabiya setups change from the Ninth to Sixteenth Century? It is difficult to make clear statements based on a total of only 50 known Tabiyas. However there are some obvious trends. First of all the Tabiyas continued to be long, despite as-Suli's and al Lajlaj's preference for shorter setups. Also, both the Islamic and European players preferred to move Pawns and neglected Knight development. The only big shift was the King placement. Whereas the King stayed at home in the classical times, starting from as far back as the fifteenth century, both Islamic and European players started to put the King on Elephant or Knight squares. Here are two examples, a classical Arabic Tabiya from the Tenth Century and a Turkish Tabiya from 1501.



Sayyala Tabiya, centre King and no Rook connection.



Gaharibana Maliha Tabiyah, protected King and Rooks connected.

Although modern castling did not appear in Italy before the middle of the Sixteenth Century, the Kraków MS (1422) gives a combined King and Fers jump to g1 and f1, identical with the King and Fers position from the Turkish Gaharibana Maliha Tabiyah.

**Endgame theory**

The most basic endgame understanding seemed relatively well developed among the Islamic players. However, as Murray (1913) points out, the statements about concrete endings were made with reference to well known masters, without giving any analysis. So for instance KNN-KN was a draw according to al-Adli but a win according to as-Suli. This five-piece endgame was solved by H. G. Muller's Five-Piece Tablebase and proved as-Suli right in claiming it was a win. The longest variation was 60 moves long, within the 70 move limit. This shows quite impressive insight as the endgame is difficult for a human player.

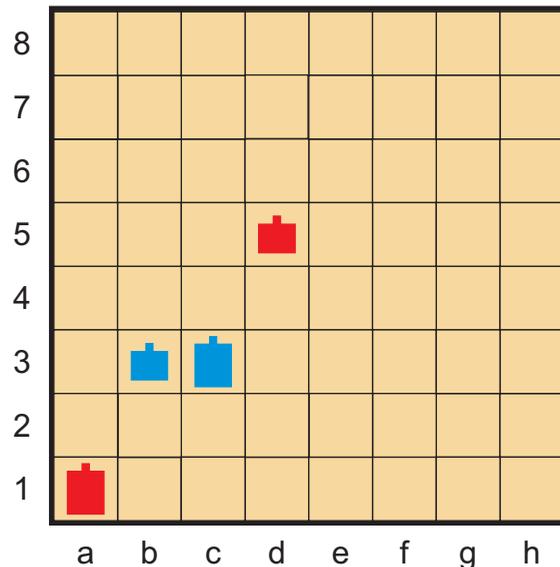
Ending	Arabic MS	Tablebase	Mellem
<b>4 pieces</b>			
KR-KF	Win	Win	
KR-KN	Draw	Draw	
KN-KE	Draw	Draw	
<b>5 pieces</b>			
KRN-KN	Draw	Draw	
KRE-KN	Win	Win	
KR-KFE	Win	Draw	
KR-KFF	Draw	Draw	
KNN-KN	Draw/Win*	Win (60)	
KFF-KF	Win	Win (73)**	
<b>6 pieces</b>			
KRE-KNE	Win		
KRF-KNF	Dependent		
KRR-KRE	Draw		Win
KNF-KFF	Dependent		
KFF-KFE	Win		Draw
KNN-KFF	Win		
KRFE-KR	Win		Draw
KRFF-KR	Win		
<b>7 pieces</b>			
KNN-KFEE	Win		
KRFF-KRF	Dependent		Draw
KRN-KNN	Not mentioned	Chess draw	

*Shatranj endgame patterns.*

\* The KNN-KN ending was drawn according to al-Adli, but a win according to as-Suli.

\*\* Some KFF-KF positions exceed 70 moves and are drawn.

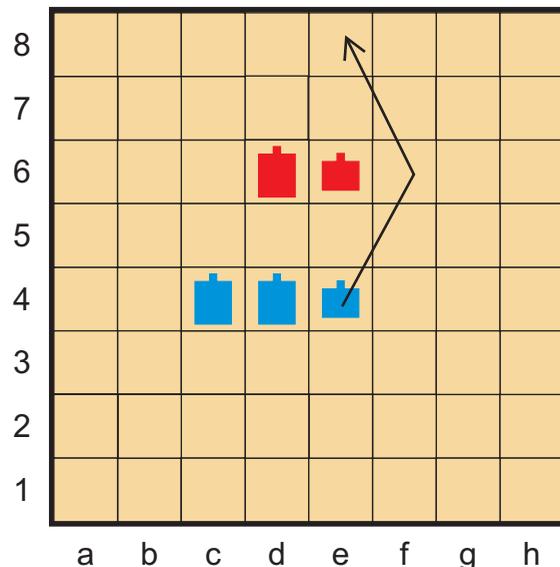
When in the beginning of the Tenth Century the Grand Master Yahya as-Suli constructed as-Suli's diamond it took more than 1,000 years before the Soviet Grand Master and endgame expert Juri Averbach solved it.



*As-Suli's Diamond, Blue to play and win..*

We will not give the solution to as-Suli's Diamond here, but the interested reader may research it!

In my practise, the KFF-KF endgame has occurred many times. Winning this endgame requires knowledge of a rather counter-intuitive plan—a King march around the enemy King leading to *zugzwang*. The longest KFF-KF win exceeds the 70 move limit rule by 3 moves. However, this is due to the first phase of the ending, where the stronger side uses time to defend the Ferses from the opponent's King and Fers.



*The blue King must march around the red King to win.*

We must also add that by the Twelfth Century, several locations in the Islamic world practised promotion to a King-moving piece instead of to a normal Fers. This rule change favoured the promoting side considerably, as the King-mover seems slightly stronger than the Knight, with a value of 3.40 given by Zillion of Games. (Continued on page 32.)



# Jetan Re-evaluated



by Fredrik Ekman

**A**bstract Games magazine Issue 6 (2001) contained no less than two articles about Edgar Rice Burroughs' chess-like game Jetan, introduced in his 1922 novel *The Chessmen of Mars* (*CM*). One article was by Kerry Handscomb, the other by L. Lynn Smith.<sup>1</sup>

The game's popularity over time is impossible to measure, yet I have a feeling that around the time of the *Abstract Games* publication, the game was rising in popularity. Smith had just created his own Jetan web site, and he was also moderator of the new Jetan mailing list on Yahoo! There were unofficial Jetan matches at the Edgar Rice Burroughs conventions, Jetan was featured on the new and expanding Chess Variants web site, the second Jetan implementation for Zillions of Games was released that same year, James Killian Spratt was producing his famous Jetan sets, and so on. And Jetan's popularity was still growing.

But this growth was fated to come to an end. Five years later, the mailing list message volume had passed its peak, updates had ceased at several new Jetan web sites, Spratt stopped making his sets, and a few more years later Jetan was no longer played at the conventions. What happened?

There is no simple answer, but I think one important aspect is this: Jetan was perceived to be too diversified and complicated; there was no generally accepted set of standard rules. Now, Jetan had always been played a little bit differently by players, but looking at older Jetan articles, there was a broad consensus about the most important rules. Those who played wildly different variants were probably very few.

Smith came around and changed all that. He proposed an elegant and complex nomenclature for Jetan variants, and he proclaimed on his Jetan mailing list, "Jetan is not a game which has variants. Jetan is a game of variants."<sup>2</sup> Smith's enthusiasm at first raised interest in the game, but I think in the long run that his hardcore insistence on the game's complexity hurt its popularity more than it helped. As late as 2019, the Wikipedia article "Jetan" began: "Jetan is a chesslike game with unclear rules."<sup>3</sup>

Fortunately, even though interest in Jetan waned, research on the game continued. Last year, I tried to sum up all that is known about the rules of Jetan. The result was published in *ERBzine*,<sup>4</sup> the main on-line repository for all things Edgar Rice Burroughs. In that article, I tried to show that Jetan is not really all that difficult. At least no more so than Chess.

So, in the light of these new findings, how do Handscomb's and Smith's old articles from *AG6* hold up?

Both Handscomb and Smith put focus on Jetan as a wagering game. For example, Handscomb writes "Jetan is usually played by the Martians as a gambling game" and Smith says "Jetan is designed to be a game of wagers"; also interesting in this context is a letter in *AG7*, where Mark Thompson suggests a very interesting gambling variant called Contract Jetan. Now, there is

nothing wrong with using Jetan with gambling, but I think this intense focus upon the gambling aspect of the game is unwarranted, at least as originally described by Burroughs. In his entire canon, Burroughs only mentions Jetan gambling in passing once, in his rules appendix to *CM*. Gambling is never mentioned in direct connection with characters actually playing the game, nor is it mentioned in the condensed but complete rules in Chapter 2. Smith's claim that "Burroughs states this [gambling] often within the novel [*CM*]" is simply incorrect. The natural assumption must be that gambling is optional, not part of the core game.

Both Handscomb and Smith suggest the idea (first proposed, I believe, by Smith) that Jetan is usually played in a series of ten games. This originates from *CM*, but is a misreading of Burroughs' words. True, Burroughs does mention a series of ten games, but always in connection with the number of games a criminal can, at worst, be sentenced to in the living Games of Jetan. This seems to be connected with the number of games (apparently two per day during five days) that are played in the annual Jeddak's Games in Manator, and those games are normally played by different players. In another passage, Burroughs writes, "If serving a sentence the number of games he [the convicted soldier] must play is also indicated [by what he wears]."<sup>5</sup> This suggests that the sentence's length is variable, so that it can be anywhere between one and ten. Hence, there is no rule, or even tradition, that Jetan between two players should be played in a series of ten games.



Warrior mounted on a Throat (Daniel Bauer, *AG6*).

Handscomb recommends using the so-called "chained" move for the pieces, i.e., a piece always has to move its full count of steps. This is the normal interpretation made by most players, and in fact the only possible one if you read Burroughs carefully. Burroughs states, "Three squares is a Chief's move—three squares in any direction or combination of directions, only provided that he does

not cross the same square twice in a given move.”<sup>6</sup> For a “free” Chief, it would be pointless to say that the same square may not be crossed twice, since the piece can stop anywhere. This quote, in combination with my analysis of the final move in the Jetan game in Chapter 17 of *CM*,<sup>4</sup> shows that the variant termed “Chained Wild” by Smith is the one that Burroughs must have intended.

In fact, my opinion is that the term “chained” does not need to be used at all. Since this was obviously the intended application by Burroughs, the so-called “chained” move should be considered standard. Non-standard rules, such as the “free” and “civil” patterns, and others described by Smith, have been used historically and deserve mention, but should be considered as variants, aside from the norm.

Handscomb and Smith, as many writers before them, make the compulsory comment about the Panthan, that it will be useless when it reaches tenth rank. However, I have never yet seen a Panthan reach farther than eighth rank, so that entire discussion appears academic. Since there is no promotion (nor should there be, as indeed both Handscomb and Smith are quick to point out), there is no reason to race toward the end of the board. Panthans tend to remain in mid-board, where they are often used to protect the power pieces, or for short-range attacks on enemy power pieces.

Handscomb remarks about the Warrior that due to the game’s logical structure, “... it is better to disallow diagonal step moves”. While this is accurate, there is an even better reason to stick to the more restricted version preferred by Handscomb and most other Jetan players: the Warrior with diagonal steps in its move is based on a typographic error from the first book edition, as I have shown in my ERBzine article. In the original pulp publication, the Warrior’s description in Chapter 2 matches that in Appendix, and it also harmonizes much better with the other piece descriptions in Chapter 2.

The Thoat’s jumping ability is about the only rule ambiguity that cannot be resolved in any satisfactory way. In Chapter 2, Burroughs says that the Thoat can jump; in the appendix, he says nothing on that subject, implying that the Thoat cannot jump.

Handscomb prefers the jumping Thoat because the Thoat, like the other jumping pieces (princess and flier) is not a foot soldier. That makes sense (although see below about the Odwar). I prefer the non-jumping variant because the appendix is a more formal and detailed set of rules. That also makes sense. We are both in the right, and it comes down to a matter of taste. In that context, it should be mentioned that the Thoat’s jumping is much less important in Jetan than the similar Knight’s jumping in Chess. Probably due to the Jetan board’s greater size and the Thoat’s greater agility, I have the impression when playing that the Thoat’s jumping or not only very rarely makes a crucial difference to the game’s outcome.

While on the subject of the appendix, allow me to dispel a myth about Jetan: Burroughs did not add the rules Appendix for the late 1922 book publication of *CM*—it was present already in the early 1922 pulp magazine edition, and was at that time identical with the version later published in the book. Hence, there is no way for us to say what version came first. Burroughs may well have written the Appendix before he started writing the book, or he may have added it as an afterthought. My guess is that he formulated the rules as part of writing his worksheets (his normal means of planning his writing, in this case detailing over 70 separate items and said to be “one of the most involved he had ever prepared”<sup>7</sup>) before starting on the novel itself. The Appendix is probably closely based on those worksheets.

Going back to the Thoat, its order of steps (free order, or orthogonal step first) is another case where there is genuine lack of clarity in Burroughs’ rules, but the latter interpretation nevertheless has a slightly stronger case when you analyse Burroughs’ wording: “2 spaces, one straight and one diagonal in any direction” (Appendix); “may move one straight and one diagonal” (Chapter 2). Both these quotes explicitly put the straight (orthogonal) step first. This is also the preference of practically all rule standards and analyses that do not opt for the jumping variety.

Another popular Jetan myth concerns the Odwar (the Flier in the Manatorian variant of Jetan), which Handscomb (along with many other Jetan scholars) assumes “moves as a Flier but may not jump,” while Smith claims “has the same move as the Flier but cannot jump.” This is incorrect, as I have shown in my analysis of *CM* Chapter 17<sup>4</sup>: The Odwar has exactly the same jumping ability as the Flier.

An interesting and rarely mentioned quirk in Burroughs’ rules concerns the escape move, which is a ten-space move in any direction or combination. The reasonable assumption (with which Handscomb agrees) is that Burroughs intended for the Princess to be placed on any unoccupied and unthreatened square on the board. Although, even if the Princess is to be moved from one corner to the opposite corner, it will take no more than nine steps. A tenth straight step would take the piece off the board. Burroughs must have forgotten to consider that the Princess is already standing on her first square, so he just gave the maximum size of the board as the escape move’s capacity. Even though Smith tries to give a number of optional interpretations, none of them sound convincingly like something that Burroughs might possibly have intended.

Both Handscomb and Smith mention the possible interpretation that the Princess may not move across a threatened square, even if she does not remain there (called a “Frightened Princess” in Smith’s nomenclature). I find it hard to understand how Burroughs’ text can be thus interpreted. Burroughs clearly states in the Appendix: “The Princess may not move *onto* a threatened square” (my emphasis). *The Oxford Universal Dictionary* defines “onto” thus: “To a position on or upon.” This appears to leave little room for any interpretation involving movement through a square.

Smith’s analysis of the variant moves is brilliant, profound and beautiful. Unfortunately, as I have shown in my own analysis of the game, it is insufficiently anchored in the “reality” of the novel text. There is no need for Smith’s elaborate classification system, simply because only the Thoat is truly ambiguous.

It may be true that it will never be possible to make every Jetan player stick to one standard set of rules, and perhaps it is not even desirable. But the opposite view, that there can never be a common standard and that every possible variant is equally relevant, is just as extreme and potentially even harmful. I have experienced several times that interested would-be players have turned away from the game when they realized that the rules can be interpreted in a multitude of ways, and that many different variants will have to be learned if they wish to play.

Several proposed standards exist. One was created as early as the 1960s for The National Fantasy Fan Federation,<sup>8</sup> although as far as I know it was never officially adopted. Most writers about Jetan since then have expressed one preferred rule interpretation, or another. One of the latest was my own suggestion in 2019.<sup>9</sup> The interesting thing is that the great majority of proposals share the same ideas, and they just so happen to be the same as mine: Most pieces are “chained”; Chief and Princess are “chained wild”; no backward step for the Panthan; no Panthan

promotion; Chief taken by non-Chief is a draw; escape goes to any free and unthreatened square.

Why are they all so similar? Well, for the simple reason that Jetan rules are not random. Even though Burroughs was a bit vague at times, it is perfectly possible to understand what he meant, and as a bit of analysis will reveal, such intuitive understanding can in most cases be supported by facts.

On the whole, Handscomb has the right idea about Jetan. He proposes a standard, and (just like so many other standards before and after him) he hits the right ideas about most things. Smith's theory about endless Jetan variants, on the other hand, is not only impossible to reconcile with Burroughs' book, but also potentially stifling to the game's popularity and growth.

**Sample game**

A summary of the Jetan rules, according to the discussion above, is given on pages 31-32.

John Gollon's classic book *Chess Variations: Ancient, Regional, and Modern* (1968) contains the oldest published Jetan game.<sup>10</sup> Each chapter in the book describes one chess variant, and for each variant is one game the author had played. The J. Miller he met here was one of his most regular opponents in these games.

Gollon plays Orange (first move) and Miller plays Black. The setup is unorthodox, with Orange playing from "south" (ranks one and two) and Black from "north" (nine and ten). Gollon suggests a number of other unorthodox rules, e.g., Thoat and Panthan moves, but none of these play any significant role in the game here played. The starting position is shown on page 31, although the colours are reversed for the sample game, below.

Abbreviations

T – Thoat, W – Warrior, Pd – Padwar, Pt – Panthan, D – Dwar, F – Flier, C – Chief, P – Princess, + – Princess threatened, e – Princess escape.

1. T-b4 T-b7, 2. W-a3 W-a8, 3. Pd-b3 Pd-b8, 4. Pt c2-d3 Pt c9-d8, 5. D-c4 D-c7, 6. F-d4 F-d7, 7. Dxc7 Ptxc7? (Txc7 would have been better, and would have saved black from Orange's next move.)
8. Pd-d5! (Diagram 1)

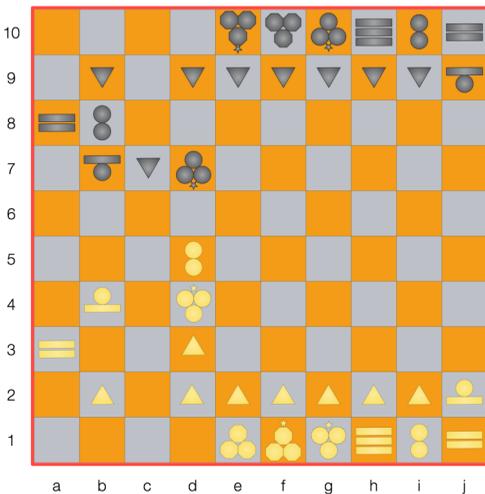


Diagram 1: Position after 8.Pd-d5.

- 8....F-g8, 9. Pdx7 Ptxb7, 10. F-g5 Pt f9-f8, 11. Pt h2-g3 Pt h9-i8, 12. D-h4 D-h7, 13. Pd-i3 Pt i9-j8, 14. T-i4 C-f7, 15. Dxh7 Ptxh7

(All Dwarfs have now been traded off. Early trades of fliers and Dwarfs are typical of beginners' games, since the beginner fails to recognize that the Panthans need to advance.) 16. Pt e2-e3 F-g7, 17. Pd-i5 F-d6, 18. F-e4 Fxg5, 19. Txg5 Cxi5 (Diagram 2—Blinded by the chance for some quick material gains, Black begins his march to doom. Even here, his position is precarious with a Chief far out on the flank and far away from his Princess.)

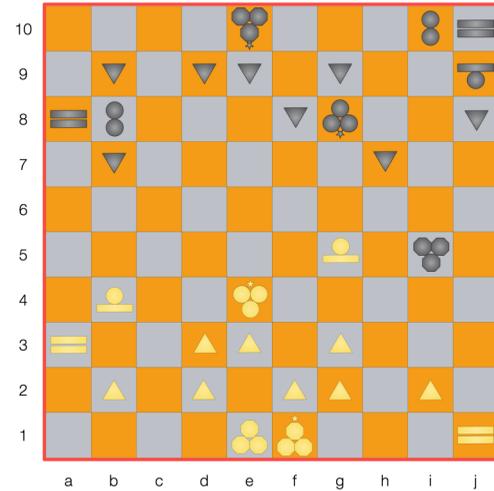


Diagram 2: Position after 19....Cxi5.

20. Pt-g4 Cxi2?! (Black risks a draw through Wxi2) 21. P-c1 Cxj1?? (The Black Chief is now stuck in the corner which he will never leave. He should have retreated instead.) 22. Txh7 (Fhx7 would have been better, forcing the Black Flier to leave its spot. Gollon was probably unaware that this was one of his most important moves in the game.) 22....Fhx7?? (Black makes a double mistake: a Thoat for a Flier is a poor trade, and black lets go of the important square d7. This will prove fatal.) 23. Fhx7+ P-c9, 24. Fxi10?! (A pointless move. Orange should have gone immediately for his next move.) 24....T-i7, 25. C-e4!! (Diagram 3—C-f4 would have been even stronger, but even as it is, the Black Chief is stuck and cannot do much.)

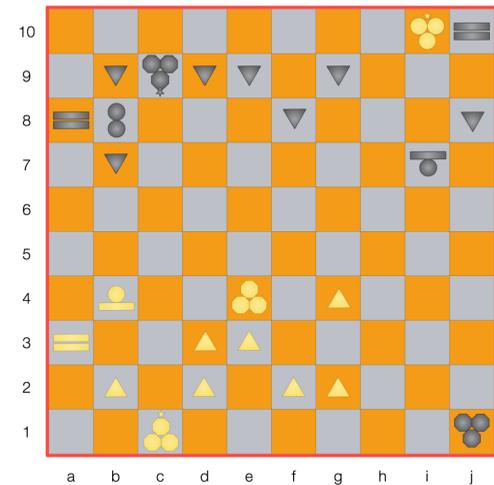


Diagram 3: Position after 25. C-e4!!

25....W-i9?, 26. C-d7+ P-f1e (Black had few options, but P-a9 or P-j2e could have taken the game to a draw. The Black Princess has nowhere to go after the next move and the game is over.) 27. C-f4+ Resign.

Many have said that Jetan is too easy to draw, since a Chief can go berzerk, killing everything until his opponent feels forced to draw by capturing the rampaging Chief. This game shows that it is not quite as easy as all that: the Chief who eats into his opponent's ranks will also leave his own forces without protection. ■

## References

Header image: Edgar Rice Burroughs (1922). *The Chessmen of Mars*. A. C. McClug. [front cover]

All citations of *CM* refer to the Gutenberg edition.

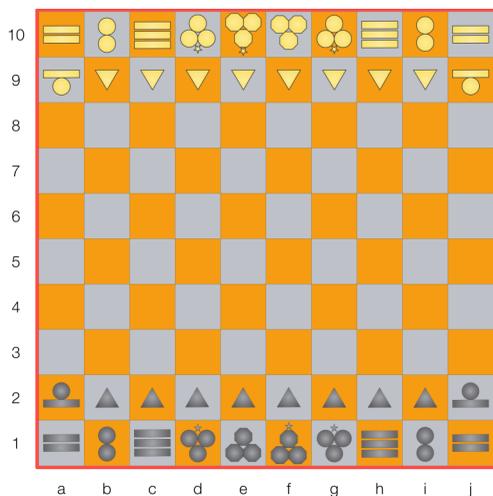
1. Kerry Handscomb, "Jetan – Martian chess" & L. Lynn Smith, "Commentary on the Rules of Jetan," *AG6*, Carpe Diem Publishing, 2001, pp. 6–11
2. L. Lynn Smith, "Re: Rule implications of Burroughs' jetan game," e-mail to jetan@yahoo.com, October 11 2002
3. "Jetan," Wikipedia (the quote in question was added on 2011-10-28 and removed on 2019-12-25) (<https://en.wikipedia.org/wiki/Jetan>)
4. Fredrik Ekman, "Exploring Jetan," ERBzine, 2019 (referenced on 2020-02-21) (<http://www.erbzine.com/mag70/7030.html>)
5. Edgar Rice Burroughs, *The Chessmen of Mars*, Gutenberg edition, Ch. 13 (<http://www.gutenberg.org/ebooks/1153>)
6. Edgar Rice Burroughs, *The Chessmen of Mars*, Gutenberg edition, Ch. 17 (<http://www.gutenberg.org/ebooks/1153>)
7. Irwin Porges, *Edgar Rice Burroughs: The Man Who Created Tarzan*, Brigham Young University Press, 1975, p. 348
8. George Fergus, "Jetan (Martian Chess)," *The Gamesman* #1, The Games Bureau, circa 1965
9. Edgar Rice Burroughs (writer) & Fredrik Ekman (editor), "The Rules of Jetan, or Martian Chess," ERBzine, 2019 referenced on 2020-02-21) (<http://www.erbzine.com/mag70/7030a.html>)
10. John Gollon, *Chess Variations: Ancient, Regional, and Modern*, Charles E. Tuttle Company, 1968, pp. 212–213

# Rules of Jetan

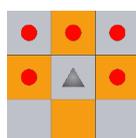
by Kerry Handscomb

Here is a summary of the rules of Jetan, based on *AG6* and adjusted slightly according to the analysis of Fredrik Ekman in the Jetan article above. The pieces in the diagrams in *AG6* were the design of Jean-Louis Cazaux. Subsequently, Fredrik Ekman, writer of the Jetan article, and I came up with the representation below opposite, which is inspired by an L. Lynn Smith design.

The black and orange chequered design and the two armies coloured black and yellow are traditional on Barsoom, and we have kept it. Note, however, the anomaly that Burroughs always used "orange" to describe the colours of both the pieces and the squares, and we have maintained this convention here and in the sample game. The bottom-right square is orange. Either Black or Orange can move first, and the players alternate turns, where a player moves one of his pieces on a turn. The powers of each piece are shown in the diagrams below.

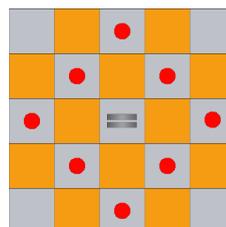
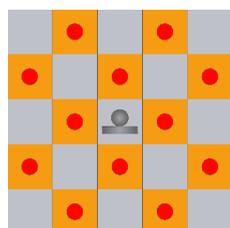


Jetan starting position

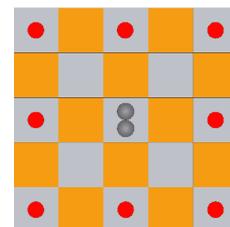


Panthan

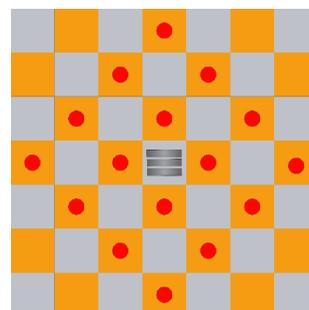
Thoat



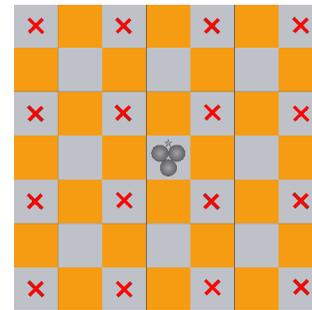
Warrior



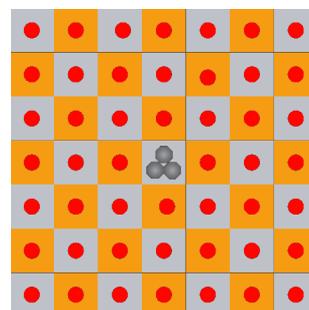
Padwar



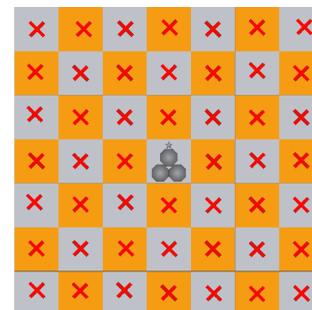
Dwar



Flier



Chief



Princess

A piece's movement follows in large part from its representation. Each piece completes its move in a series of one-square step moves, either orthogonally or diagonally. The number of steps a piece can move in a turn is equal to the number of distinct symbols in its piece representation (aside from the stars for the Flier and Princess). Thus, the Panthan moves one step; the Thoat, Warrior, and Padwar move two steps; the Dwar, Flier, Chief, and Princess move three steps.

Each horizontal bar refers to a one step orthogonally; each circle refers to one step diagonally; each octagon refers to a single step either orthogonally or diagonally. The triangle representation of the Panthan is exceptional, referring to a one-square step move either sideways or to one of the three forward squares. Pieces must move the number of steps specified, not less, and can change direction with each step. The Thoat must make an orthogonal step first and then a diagonal step.

A piece cannot make a "null move," by simply returning to its starting square. A piece cannot end its move in a square occupied by a friendly piece, but may end its move in a square occupied by an enemy piece, thereby capturing the enemy piece.

The exception to the capturing rule is the Princess, who cannot capture enemy pieces and cannot finish her move on a square threatened by an enemy piece. Once in the game, the Princess can make an exceptional escape move, to any unoccupied square on the board that is not threatened by an enemy piece.

The red circles and crosses indicate which squares a piece can reach in a single turn. The stars in the representations of the Flier and Princess show that these pieces can jump, and can reach the specified squares no matter if there are intervening pieces, of either colour. For this reason, possible destination squares for the Flier and Princess are represented by red crosses, not red circles. If a piece cannot jump, every square in its series of steps must be empty, except possibly the last square, which may be occupied by an enemy piece.

Once you understand the simple symbol system, you can tell how a piece can move by looking at its representation. A difference from the rules in *AG6* is the non-jumping Thoat. I have accepted Fredrik's analysis and preference that the Thoat should not be allowed to jump. Likewise, I accept his recommendation that there is no distinction between Odwar and Flier, both can jump, and they are different names for the same piece.

The game is won by capturing the opponent's Princess. The game can be won also by capturing the opponent's Chief with your own Chief. If a Chief is captured by any piece other than the opposing Chief, the game is drawn. The game can be drawn also when both sides are reduced to three pieces or less of equal value, and neither side wins in the succeeding ten moves, five moves each.

### Proposed variant

Burroughs does not specify what "equal value" means for pieces. I will assume that a piece's value is the number of step moves it can make on a turn. I propose that when both sides are reduced to three or fewer pieces of unequal total value, then the player with the higher total valued set of remaining pieces wins. According to Burroughs' rules, of course, if the total value is equal, then the players have five moves each to finish the game decisively. Note that the three pieces on each side must include the Chief and Princess each, for otherwise the game would be decided already. The value of the third of these pieces on each side is what determines a win or potential draw. Of course, further study and experience of Jetan may indicate that the proposal needs to be adjusted or eliminated. ■

(*Shatranj*, continued from page 27.)

Another endgame that occurs often is KRFE-KR. The Arabic MS claims this endgame is a win, no matter if the Fers and Elephant are connected. Still, we know of a story where the Grand Master Rabrab played this endgame against a weaker opponent, trying to win it for almost one day before giving up in disgust.

Unfortunately we still do not have six-piece Tablebases for Shatranj, but my practise against both myself and the Zillions of Games engine leads me to believe that the weak side is able to hold the strong side to a draw. ■

### Literature list

All sources listed below were used as background material for this article, although direct citations in the text are informal or sometimes omitted.

- Benary, Walter (1910). *Zur Geschichte des Matsieges*. In *Deutsche Schachblätter*. Coburg.
- Bubczyk, Robert (2009). *Gryna szachownicy*. Lublin.
- ChessCoach (2015). Philidor's Pawn Phalanx Strategy in a Game of Shatranj. Youtube (Retrieved May 4, 2020).
- Ferlito, Gianferlice (1994). "Old Islamic Chessmen." *München*. (Retrieved May 4, 2020).
- *FinalGen—Endgame tablebase generator* [Broken link].
- Golombek, Harry (1976). *A History of Chess*. Routledge and Kegan Paul.
- Gralla, René (2010). "Oldest chess game recorded." (Retrieved May 4, 2020)
- Hearst, Eliot S. & Knott, John (2009). *Blindfold Chess — History, Champions, Psychology, Records*. McFarland, USA.
- Hesse, Christian (2007). *Expeditionen in die Schachwelt*. Nettetal: Chessgate, Germany.
- Hooper, David & Whyld, Kenneth (1984). *The Oxford Companion to Chess*. Oxford.
- Kluge-Pinsker, Antje (1994). "Brettspiele, insbesondere 'tabuale' und 'schacchis' im Alltag der Gesellschaft des 11. und 12. Jahrhundert." *Homo Ludens*, 4, pp. 69-79. München.
- Kohtz, Johannes (1910). "Von Ur-Schach." *Desutsches Wochensschach*. Potsdam.
- Kohtz, Johannes (1916). *Kurtze Geschichte des Schachspiels*. Dresden.
- *Logistic Regression calculator*. (Retrieved May 4, 2020)
- Müller, H. G. *Shatranj 5-man tablebase*.
- Murray, H. J. R. (1913). *A History of Chess*. Oxford. (Retrieved May 4, 2020)
- Murray, H J R (1911). *Über die Erfindung des Schachspiels und die Geschichte de Beraubnungssieges*. Postdam
- *Nalimov Endgame Tablebases* (Retrieved May 4, 2020)
- Pickthall, Marmaduke (1930). *Quran*. Cambridge. (Retrieved May 4, 2020)
- Regan, Kenneth W., Maciejaja, Bartolomiej, & Haworth, Guy McC. (2011). "Understanding Distributions of Chess Performances." *Warszawa*. (Retrieved May 4, 2020)
- Sadler, Matthew & Regan, Natasha (2019). *Game Changer: Alpha Zero's Groundbreaking Chess Strategies and Promise of AI*. New in Chess..
- Soltis, Andrew (2014). *Soviet Chess 1917-1991*. McFarland Publishing, England.
- Watson, John (1998). *Secrets of Modern Chess Strategy*. Gambit Publications, London.
- Wilson, Fred (1981). *A Picture History of Chess*. Dover Publications, New York..



# Random in the Abstract

## Part 2: On dice and life

by Mitchell Thomashow

In the beginning there were two. Two dice, that is. Can you enter the bottomless well of your childhood and remember the first time you encountered dice. If you are an avid gamer I am sure you can. Where did you first encounter them? Was it Monopoly? Or Risk? Or a simple childhood game? Did you roll those dice and say, “This is good”? I surely did.

In the late 1950’s I played a game called Dice Baseball. You threw two dice and different combinations resulted in various outcomes. Two sixes was a home run. A four and a three was a ground out. I would organize my baseball cards into lineups and play multiple games. It was all luck based, but with just a little bit of imagination it seemed very real. I would invent all kinds of sporting games with dice—hockey, football, and basketball. I figured out a way to approximate the scores of pro games. If you roll four dice twice, the sum will be very close to one quarter of a professional basketball game. I am convinced that my arithmetic skills emerged from countless games of Dice Basketball.

In fourth grade, I went to my friend Lenny Volin’s house. He had an exotic game called APBA Baseball. I discovered the meaning of the term realistic. APBA cards of baseball players would simulate their professional performances. Of course, I eventually graduated to even more sophisticated, dice-based sports simulations.

There were many other dice games. Yahtzee was the most interesting. Then there were the dice with letters. My first such dice word game was Spill and Spell. You can no doubt recall your own experiences with dice. Depending on your age and when you discovered board games, I am sure you have a unique dice autobiography. An entire generation was reared on the polyhedral dice required for Dungeons & Dragons. Then I discovered Backgammon, its many variants, and through the years I have explored some of its many iterations—Chebache (*AG3*), Tatsu, Dodecamente.

In the last decade along with the boom in Eurogames, we are enjoying the proliferation of dice games, many of which present wonderful new ways of using traditional dice. It seems that all the top designers have at some point utilized so-called dice mechanics in their designs. Reiner Knizia wrote an entire book on the mathematics of more traditional dice game, *Dice Games Properly Explained*, and we have games such as *Grand Austria Hotel*, *The Voyages of Marco Polo*, *Castles of Burgundy*, and countless others. We have seen an almost unimaginable variety of custom dice for games such as *Roll for the Galaxy*. Dice are used to simulate buildings or art works in *Blueprints*, *Cubist*, and *Sagrada*. Or they are used to build things (*Das Spiel*). And there are dozens of new pure dice games like the *Quixx* series, *Ganz Schön Clever*, *Birth*, *Dizzle*, and *Dice Stars*. We have fairly complex dice rollers like *Favor of the Pharaoh* and *La Granja: No Siesta*. Readers know I am merely scratching the surface here. For a more

comprehensive look at the “roll and write” genre of dice games, check out this BGG list (<https://boardgamegeek.com/geeklist/213815/roll-n-write-games>).

There are quite a few abstract games that use dice as playing pieces. These games do not involve any random factors, rather they use dice as intriguing ways to claim territory, move, and establish patterns. *Chase (AG9)* is among the best of these efforts. One of my favourites is *Colliding Circles*. For a somewhat dated list of these games, check out this BGG list (<https://boardgamegeek.com/geeklist/111594/item/1995030#item1995030>)



*Sagrada*

I would like to offer some ideas on the meaning of dice, and why they are so important in many cultures through space and time. Dice (and their predecessors) simulate random processes. In his comprehensive *Oxford History of Board Games*, David Parlett surveys the extraordinary predecessors to dice, stretching back to antiquity: “The Indians of Asia have been using cowrie shells from 2300 BCE to the present day and those of the Rig Veda (c.1500 BCE) used multiples of the naturally binary vibhitaka nut.” There is a lovely illustration displaying Amerindian binary lots, including sticks, sea shells, walnut shells, plum stones, bone, wood, corn grain, and beaver teeth, from native cultures throughout North America. Parlett also discusses the relationship between divination, soothsaying, and games of chance, hesitant to draw any conclusions about the relationships.

However, John Minford in his recent *I Ching* translation describes the game-like character of the *I Ching*. If you have never experienced the *I Ching*, it is a sophisticated divination system, linked to centuries of Taoist, Buddhist, and Confucian wisdom. It

consists of eight trigrams of dashed and solid lines, representing natural systems—heaven, earth, fire, water, wood, mountain, lake, thunder, and wind. Through a divination process, these eight trigrams combine to form 64 hexagrams. Each hexagram represents a metaphor, ripe for interpretation. Historical commentary on the hexagrams is comprehensive, rivalling the *Bible*, the *Torah*, the *Koran*, and *Buddhist Scriptures*. What is unique is how the divination process reflects a unique circumstance at any given point in time. It is worthwhile to read how John Minford compares the process to a game:

“The *I Ching* is a game, a most demanding game. One does not just read it, one does not just translate it. One plays it, one plays with it, one interacts with it. It plays, too, in deadly earnest.... The act of reading creates a new dynamic, triggering reflections and conversations that might otherwise never take place. To call this a game is not to be irreverent, it is not to trivialize it. On the contrary, it is to elevate it.”

Intriguingly, one proponent of the *I Ching* has found a way to use one d20 die and one d8 die to simulate the traditional yarrow sticks divination method (<http://www.castingiching.com/2016/07/iching-two-dice-1.html>).



*Colliding Circles and Chase.*

A recent issue of *Abstract Games* magazine (AG17) describes SanQi, a game inspired by the *Ling Ch'i Ching*, an oracle system designed as a more accessible version of the *I Ching*. Playing pieces are Heaven (Shang), Man (Zhong), and Earth (Xia). You can play the excellent game and then learn about the system in Ralph D. Sawyer's translation.

I do not think this is far fetched. We play games for many reasons—to exercise our minds, to build social connection, and for entertainment. But we also play to learn about life. Why else would you spend the countless hours that you do playing games, thinking about them, collecting them, and adoring them? Why do we treasure a game that is filled with mystery, that is accessible but unknowable, that is beautiful to behold and play, and that allows us to grow with it? I would not say that life is a game, but games do resemble life. Perhaps a great game designer will use the *I Ching* as the basis of a wonderful, unsurpassed Eurogame, or develop an entirely new genre of abstract game, combining the eight archetypes with dice.

Let us get back to dice. When you roll the dice, whether they are d6 or d20, whether it's just one or a handful, whether it's custom made with unique icons, you are setting the conditions of your turn, or a round, or perhaps the entire game. You have to deal with it. There is no other choice. So you make the best of it. Is it just a matter of probabilities for you? If you are a mathematician or statistician it might be, and if you like, you can use mathematics and statistics to form a philosophy of life. Max Tegmark, in *Our Mathematical Universe; Our Quest for the Ultimate Nature of Reality* believes that the universe and all it contains is a glorious

suite of wonderful equations. I would rather get my wisdom from the *I Ching*. Or at least roam back and forth between the two approaches by letting them inform each other. Either way, dice are a fascinating tool to help you discover who you are within the boundaries of a game. To put it briefly, you have to learn how to go with the flow!

Here is a silly thing I sometimes do. Often I cannot choose what game to play. So I find a way to divide my shelves into a division of six, and roll a die to locate a specific shelf. And then I count the number of games on that shelf and turn them into a division of six. Voila! I've chosen a game for the evening. It is a better process than staring blankly at my shelves, feeling increasingly incapable of making a choice among so many possibilities. Let the dice decide. Or as the instructions to Chebache, a Backgammon variant suggest, “Be one with the dice.” [The author's decision-making process is reminiscent of *The Dice Man* by Luke Rinehart, 1971. ~Ed.]

Dice, like playing cards, are one of the great inventions of human culture. They are global in scope and extent. They span cultures and time periods. Playing games with dice and cards (not necessarily gambling) brings people and cultures together. My goodness, we sure can use more of that!

Dice teach you about risk, what it means to take chances, and how random processes are linked to everyday choices. What is the role of random processes in quantum physics, in evolutionary biology, or in presidential elections? How many times do you encounter a fork in the road, a crucial life decision, or some other kind of meaningful choice? What would have happened if you chose an alternative? What informed your decision? This is where the *I Ching* comes in. Through the divination process you arrive at a hexagram that provides a metaphor that helps you make your decision. It taps into what you already know. So do dice. When you reach that crucial point in a game, you might already have a strategy. The roll of the dice interferes with it. Do you go with your original approach? Or does the die roll force you to consider creative alternatives? This is what distinguishes the meaningful use of dice from sheer luck. How do random processes appear and how do they help you structure your decision tree?

The most wonderful aspect of dice is how much fun they are. And how pretty they can be. The dice in Sagrada are lovely to behold in action and there is no doubt that the bag of colourful dice is the game's best feature. Then you get to roll them. Every roll is a new prospect—irony, humour, hubris, outrage, satisfaction, and delight. What will your response be?

So the next time you roll dice, think about how it connects you to many human cultures through space and time, how it is a way to reflect on your own behaviour, and how it is the source of so much fun. Dice matter, games matter, and they are both a window into what it means to be human. ■

Push Fight Puzzle Solutions from page 15

Puzzle 1: b2-c1, f4-f2, c1xd1. Green's f1 circle is toast.

Puzzle 2: d1-b3, f2-c1, e4xd4. Green's c4 square is toast. Instead targeting Green's c3 circle with e4-e3, d1-b2, e3xd3 is tempting, but it actually loses immediately for Blue. Can you see how?

Puzzle 3: c3-b2, e4-f3, f3xf2. The only way for Green to save the f1 square is to push left, but then she will lose the b1 square since it cannot escape.



## Steve Meyers' BoxOff

by Kerry Handscomb

Steve Meyers' BoxOff has the feel of a classic solitaire abstract game. Brightly coloured pieces are distributed on a rectangular grid of squares and removed in pairs of like colour until the board is empty. It reminds me most of the old peg Solitaire, which dates back at least to the Seventeenth Century, which also handles pieces a pair at a time, albeit by jumping, unlike BoxOff. Peg Solitaire (see the image on page 13) has the same objective as BoxOff, to empty the board—except of course for the very last piece in Peg Solitaire. In my opinion, Steve's game is much better. The randomization of the board position supplies endless variety, like card solitaire. Moreover, the size of the board and number of colours used can be scaled up or down to suit the player, thereby altering the game's length and difficulty. Interesting strategies are emerging as I continue to play the game. Importantly, it is very easy to make a beautiful-looking BoxOff set inexpensively.

BoxOff was first presented in *Games* magazine in August 2013, and BoxOff puzzles ran in its successor, *Games World of Puzzles*, in May 2017, February 2018, and October 2018. However, I think we can complement the original *Games* article here, and BoxOff is so good anyway that it deserves a second look. I do not think we need to present puzzles on this game, because it is so easy to construct your own set and produce puzzle after puzzle for yourself.

There is a BoxOff app available for iOS, as well as a separate app available for Android. In both apps 100% of boards are solvable, and there is the option to take back your moves. Cameron Browne and Frederic Maire wrote a scholarly article about BoxOff called "Monte Carlo Analysis of a Puzzle Game." It appeared in *Advances in Artificial Intelligence* and describes some interesting mathematical results, including the fact that 8x6 BoxOff with three colours—the format given in the original *Games* article—is unsolvable in only about one in five thousand random initial setups.

### Rules

BoxOff can be played with sets of pieces consisting of three colours, four colours, or five colours. The fewer the colours, the easier the game. The number of pieces of each colour must be the same and must be an even number, because the pieces are removed from the board in pairs of the same colour. For example, four colours with 14 pieces each makes a good game on a 7x8 board, or five colours with 12 pieces each makes a more challenging game on a 6x10 board. Steve recommends five colours with 36 pieces each on a 12x15 board. I use a Renju board (15x15 points, so 14x14 squares) on which different board sizes can be marked off with painter's tape for experimentation—see the header image. The largest size I have tried, using the Renju board, is 10x12, with

24 pieces each of five different colours. Beautiful glass "gem" pieces can be sourced from craft stores, or even from dollar stores, quite inexpensively.

The pieces are shuffled and distributed randomly on the squares of the board. Pairs of pieces of the same colour are removed, pair by pair, until (hopefully) the board is empty. If you get stuck with pieces still on the board, which cannot be removed, the game is lost. Shuffle up the pieces and start again!

To remove a pair of pieces, they must lie at opposite corners of a rectangle that is otherwise empty of any other pieces. See Diagram 1 for examples. Rectangles of length or width 1 also count. The smallest rectangle is 1x2 (or 2x1), in which a pair of like-coloured pieces are orthogonally adjacent. Your only choice at the beginning of a game is to remove such a pair. And those are all the rules. BoxOff is important as a solitaire game, because it is so natural and minimal.

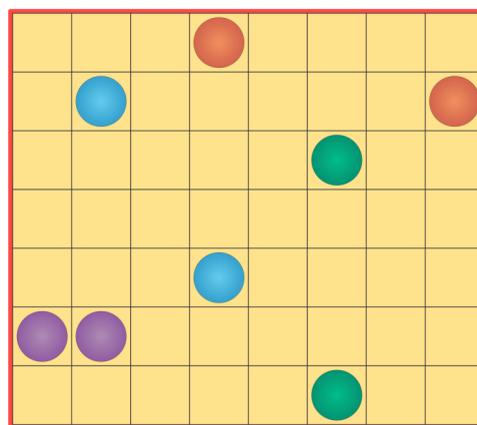


Diagram 1: Each of the four pairs of pieces can be removed.

### Entanglements

Now, if you set up your board and start removing pairs of pieces randomly, you are likely to run into positions that I refer to as *entanglements*, that will ruin your chances of winning. Diagram 2 shows some examples of simple entanglements. As it stands, this position at the end of the game would illustrate a lost game. However, consider the entanglement of green and blue pieces in the top left: there may be green or blue pieces elsewhere on the board that can relieve the situation. If, for example, there is another blue piece in the bottom left of the board, then the pair including C could be removed. Subsequently, the green pair A and B can be removed, and there will be another blue piece somewhere, hopefully not too entangled itself, by which the blue D can be removed. A similar scenario can be envisioned with the green B first removed, using another green piece on the right. However, if green A or blue D are first removed, with a green or blue piece outside this arrangement, respectively, the remaining pieces are still entangled. The pattern of red and white pieces is given to show the very simplest and smallest kind of entanglement.

Of course, entanglements can be more complex than these, and Diagram 3 gives some examples. To the left of the board, the red, purple, and blue pieces are entangled. If purple E can be eliminated, with another purple piece outside the position, then blue C and D fall, followed by red A and B, and lastly a fourth purple piece, hopefully, takes care of purple F. If any other piece is removed first, by another piece beyond this position, it remains entangled.



Diagram 2: Simple entanglements

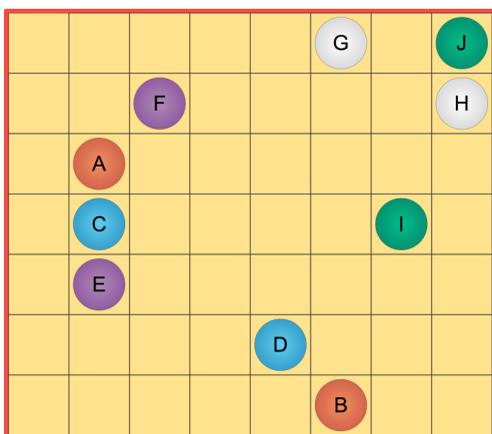


Diagram 3: More complex entanglements.

The green and white pieces in Diagram 3 are a simple entanglement, but, importantly, an entanglement in the corner. Entanglements rely on external pieces to be resolved. However, in the corner of the board like this, there can be no other pieces above or to the right that can unravel this entanglement—it must rely on external pieces below or to the left. There are fewer options to resolve corner entanglements, and corner entanglements are therefore often more tricky.

Of course, the board at the outset is one massive entanglement, aside from any pairs of orthogonally adjacent like-coloured pieces. Starting with one or more of these pairs, the goal is gradually to unravel the whole arrangement step by step.

### Board size and number of colours

With the discussion of entanglements out of the way, I can explain the influence of the number of colours and the size of the board on how the game plays. With more colours, there are simply more and more difficult entanglements to unravel. Or look at it this way, with a greater number of colours, proportionately, there will be fewer pieces of the colour you need to unravel each entanglement.

Three colours makes for an easy game, generally, whereas five colours leads to much harder games. Four colours is a good medium choice, although keen players will prefer five colours for the challenge.

Regarding board size, larger boards have more pieces. Therefore, when trying to resolve a particular entanglement, there will simply be more pieces beyond this entanglement that can help

unravel it. For a given number of colours, larger boards make for easier games, whereas smaller boards make for harder games. On a 2x2 board, for example, with two colours, the game is unsolvable if the red and white position occurs from Diagram 2—not all opening positions have a solution! A 7x8 board with four colours, as in the diagrams, works well for an easier game. If you want a tougher game, you can try five colours on a 6x10 board, or larger. As I mentioned above, sometimes I play on a 10x12 board with five colours for a long and challenging game!

### Strategy

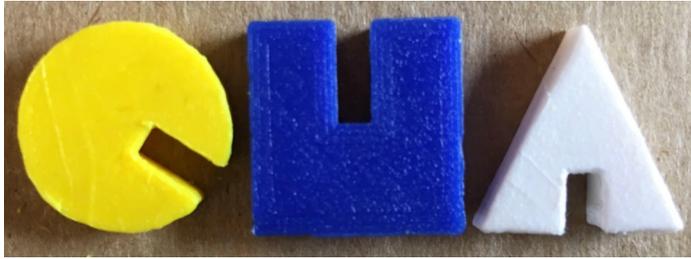
Steven Meyers, designer of BoxOff, made the following points about strategy:

- The beginning of the game can be compared to acupuncture—the goal is to relieve the pressure points, which in BoxOff can be considered localities where several colours are tightly interlocked. If you wait to attend to these pressure points, you will likely run out of matching options later and therefore be stuck in an impossible position. Pressure points in the corner are the most urgent, then along the short sides, and then along the long sides. It is rare for there to be a pressure point in the centre that requires immediate attention, because of the plethora of matching options afforded by the favourable geography.
- Be aware when a single piece of a certain colour is a considerable distance from its fellows. Don't wait too long to think about what you're going to match it with, or you might very well run out of options.
- Be aware when one colour is getting low. For instance, suppose there are 12 black stones left, 14 white stones left, and just 4 red stones left. You could be in big trouble with regard to eliminating red because of the very limited number of matching options. Don't get low on a colour when there are still numerous stones of other colours on the board, unless you can see ahead exactly how the colour is going to be eliminated.
- When resolving a local pressure point early in the game, resist the temptation to play out the entire sequence. Leave a move or two undone. You can always come back to them later, but you will sometimes find—to your surprise—that these pieces end up being key to resolving a situation elsewhere.

I can add for clarification that if you can see a way to eliminate a colour completely, then do it! In fact one strategy at the outset is to examine the initial setup to see if you can find a way to remove one colour completely. If you can, then many potential entanglements are automatically resolved, and it is far easier to deal with the remaining colours. ■



*Steven Meyers was a valued contributor to the old series of Abstract Games. We covered his game Anchor in AG5 and then Orbit in AG12. His game BoxOff has a level of minimalism close to that of Hex, as well as the flexibility to make a solitaire abstract gaming experience as easy or as difficult as you like. BoxOff should become a classic. If you would like to discuss BoxOff with Steve, he is happy to receive email enquiries: [swmeyers@fuse.net](mailto:swmeyers@fuse.net). ~Ed.*



## A three-dimensional connection game

by Woody Pidcock

Qua is an ingenious three-dimensional (3D) connection game for three players. The Qua game board is a 3D grid of cells called a *Qua Cube*. The game uses three different identifying marks, called *qua*, one for each player. The Qua Cube does not start out empty. Some of its cells are permanently filled in with one of these three qua. A qua has colour and shape and is also used to identify a player's ownership of opposite faces on the Qua Cube game board and their game-play pieces. One set of choices for qua are yellow circles, blue squares, and white triangles modified slightly to form the letters Q, U, and A, as shown in the title, above.

### Qua Game Board Layout

An alternative choice for qua are white circles, gray squares and black triangles, as shown in Diagram 1. The starting position for a 3x3x3 game of Qua is shown in the lower left. The starting position for a 5x5x5 game is constructed by repeating the permanent qua pattern of filled in cells in all three orthogonal directions.

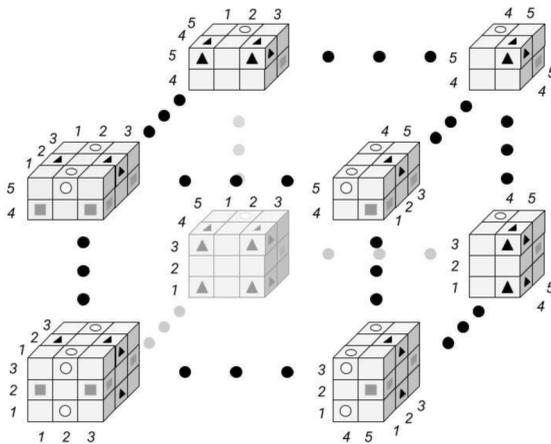


Diagram 1: The 5x5x5 Qua Cube Game Board Layout.

A Qua Cube game board can be of arbitrary size and has an  $N \times N \times N$  cube structure composed of  $N^3$  cells. Each of these cells are  $1 \times 1 \times 1$  cubes. A cell is adjacent to a neighbouring cell if it shares a cell face with it.  $N^2$  cells in the shape of a square are adjacent to each of the six Qua Cube faces.  $N$  cells in a straight line form a Qua Cube edge, where each of the 12 edges is adjacent to two Qua Cube faces. One cell in each of the eight Qua Cube corners is adjacent to three different Qua Cube faces.

For the 5x5x5 Qua Cube game board, 54 cells are initially filled-in with qua and 71 cells are empty. The assignment of cube faces to players is not shown in Diagram 1. Left and right cube faces belong to the White Circle player. Front and back cube faces

belong to the Black Triangle player. Top and bottom cube faces belong to the Gray Square player.

### Rules

At the start of a game, players choose their qua and decide who will go first, second and third. Players take turns placing qua in an empty cell, which must be adjacent to two cells already containing their qua or one such cell and one of their cube faces. This forms or adds to a chain of qua in either a straight line or right angle turn, depending on which cells are adjacent to the cell being occupied by a player that turn. The first player to complete a chain of qua that connects their two cube faces wins.

### Notes

The initial arrangement of qua in the 5x5x5 Qua Cube game board shown in Diagram 1 guarantees there will always be a winner. This is true for all Qua Cube game boards using the same arrangement pattern for odd values of  $N$ . For an  $N \times N \times N$  Qua Cube,  $3 \times (N-1)/2 \times ((N+1)/2)^2$  cells are initially filled-in using the rotationally symmetric pattern shown in Diagram 1. Hidden from view are cells on the left, back and bottom of the eight parts. The qua for these hidden cells are identical to corresponding cells on the right, front, and top.

### Strategy and Tactics

Because this is a three-player game, the second player does not need to block single threats by the first player, the third player does not need to block single threats by the second player and the first player does not need to block single threats by the third player. However, if the player before you makes a double threat, block the one the next player cannot block, if there is one.

In a 3x3x3 Qua game, the first player has a significant advantage. The second and third players need to cooperate to avoid a quick win by the first player. For the 3x3x3 Qua game, if the first player's first move is to occupy a cube corner cell, the second player's first move should be to occupy the 3D orthogonally opposite cube corner cell.

If the player before you makes a threat, it is important to notice and block it if it cannot be blocked by the next player. Avoid making threats when the next player can make a double threat of their own. When in doubt, take away the next player's best move.

### History

Martha Pidcock came up with the game idea in 2016 as a 3D extension of the Game of Gale (Gardner, 1987, p.84), marketed as Bridg-It (Browne, 2005, p.15-17). The novel idea involved combining the identifiers for bridges and posts into a single identifying mark, and replacing the interspersed grids of pegs with a single 3D matrix of cells. Also, instead of having end posts along the sides of the board, these were replaced by assigning the identifying marks to cube faces. For a more detailed description on how this was done, see the Appendix.

In 2019, Sherwood Pidcock prototyped the 3D game on a 3D printer and named it Qua® (Pidcock, 2019). A prototype of the Qua Game is shown in the picture below. The Yellow Circles (Q) player wins by completing a chain from left to right; the Blue Squares (U) player wins by completing a chain from top to bottom; the White Triangles (A) player wins by completing a chain from front to back.

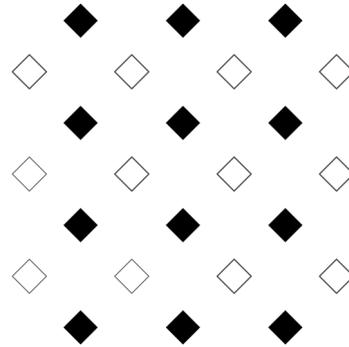


Diagram 2: A 3x3 Bridg-It Game Board.

### Dice Qua

Players roll a die to decide which qua they will play each turn. A player may win on an opposing player's turn!

Dice Qua is also a way to play the game with two players. Players choose their qua at the start of the game and then roll a die each turn to determine which qua game play piece to play. A player wins when a complete chain of their qua connects their two cube faces. This may happen on the opponent's turn. If the unselected third player's qua completes a chain between its two cube faces, play continues. The game is a draw if neither of the game's players has a complete chain between their two cube faces before all the empty cells on the game board are filled (unlikely).

### References

- Browne, C. B. (2005). *Connection games: Variations on a theme*. Wellesley, MA: AK Peters.
- Gardner, M. (1987). *The 2nd SCIENTIFIC AMERICAN book of mathematical puzzles & diversions*. Chicago, IL: The University of Chicago Press.
- Pidcock, S. C. (2019). Qua, Retrieved February 11, 2020.

### Appendix: Extending Bridg-It into 3D to create the Game of Qua

Diagram 2 shows a 3x3 Bridg-It game board with interspersed grids of black and white pegs. In Bridg-It, players take turns placing a bridge that connects two pegs of their colour and goes between two pegs of the opposing player's colour, blocking them from becoming connected (Browne, 2005, p. 15).

White's sides are left and right; Black's sides are front and back. The Bridg-It game in Diagram 2 has  $9 + 4 = 13$  possible bridge placement locations, where either the White player or the Black player can place a bridge to connect their pegs while blocking the other player from doing the same. Placement of a bridge at nine of these locations goes perpendicular to the player's two sides, and placement of a bridge at the other four locations goes parallel to the player's two sides. To extend this into 3D, imagine gray pegs above and below the nine locations where bridge placement will be perpendicular to a player's sides. A third Gray player placing a vertical bridge at any of these 9 locations would block both the White player and Black player from placing a bridge at that location. Note that a bridge placement at these locations by this Gray player would be perpendicular to the bottom and top faces of an imagined cube, which would belong to Gray.

A bridge placed by the White or Black player at the other four bridge placement locations in Diagram 2 are parallel to these players' two sides. Since the Gray player cannot place a bridge to connect two gray pegs at these locations parallel to the gray player's two cube faces, only the White player or Black player can place a bridge at these locations.

The Bridg-It game board shown in Diagram 2 is redrawn in Diagram 3 using circles and triangles instead of pegs, and the pegs along the sides are placed outside of a 5x5 square matrix.

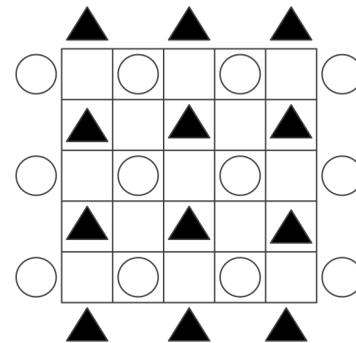


Diagram 3: A Circles and Triangles Representation of the 3x3 Bridg-It Game Board.

This representation facilitates extending Bridg-It into 3D by replacing the white and black overlapping rectangular grids with a 5x5 square composed of empty cells and cells filled-in with white circles and black triangles. The 13 bridge placement locations from Diagram 2 become the 13 empty cells inside the 5x5 square game board shown in Diagram 3. The white circles and black triangles outside this game board, which identify the sides of the game board belonging to the White Circle and Black Triangle players, will be removed.

Using the terminology Layers, Ranks and Files will help describe 3D orientations when forming the Qua Cube game board extension to the Bridg-It Square game board.

In Diagram 3, visualize the 25 cells inside the square as 1x1x1 cubes, which form the horizontal bottom, middle, and top Layers of the 5x5x5 Qua Cube Game Board shown in Diagram 1. Diagrams 4 and 5 are two more Bridg-It Square game board representations of Diagram 2. The 25 cells inside the 5x5 squares in these figures can also be visualized as 1x1x1 cubes. Diagram 4 forms the front, middle and back vertical Ranks of Diagram 1. Diagram 5 forms the left, middle and right vertical Files of Diagram 1.

*"I've always been passionate about geometry and the study of three-dimensional forms." ~ Erno Rubik, inventor of Rubik's Cube*

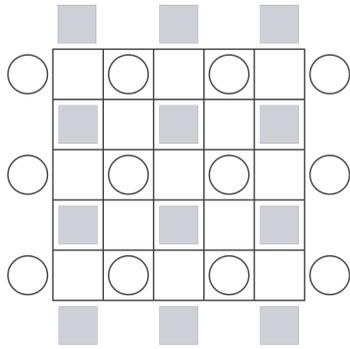


Diagram 4: A Circles and Squares Representation of the 3x3 Bridg-It Game Board.

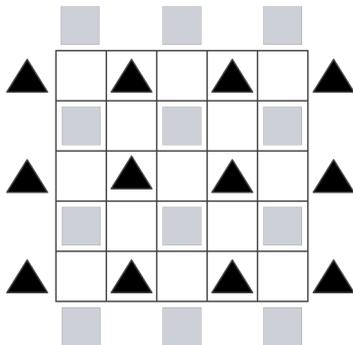


Diagram 5: A Triangles and Squares Representation of the 3x3 Bridg-It Game Board.

Inside the 5x5x5 Qua Cube Game Board shown in Diagram 1, there are four cells in each of the even numbered planes (Layers, Ranks and Files) that correspond to the locations above and below the four parallel bridge placement locations in Diagram 2. To maintain 3D rotational symmetry, they could not be filled in with any of the three qua identifying marks. They could have been specified as null cells, unavailable for game play. However, to guarantee there is always a winner for a 5x5x5 Qua game, it is necessary for these cells (eight total) to be empty and available for game play when two adjacent cells are occupied by the same qua.

Proving there is always a winner for Qua Games where N is odd is a challenge to the reader. Another challenge is constructing an alternate initial Qua Cube game board layout where N = 4 that avoids frequent draws or a forced win by the first player. An example is given in Qua (Pidcock, 2019). ■

Sherwood Pidcock, who goes by Woody, currently lives in Washington State. Woody is a lifelong student and teacher who loves mathematics, especially geometry. Martha is Woody's daughter.

Qua is a most unusual three-dimensional game. As I mentioned in the description of 3D XYZ Chess, genuinely three-dimensional games are a rarity, perhaps with two exceptions, three-dimensional alignment games and three-dimensional chess games. Qua is the first three-dimensional connection game, at least in my experience. But somehow, it makes complete logical sense—there are three pairs of opposite faces on a cube, each pair to be connected by one of the three players. Just as Qua is a translation of Bridg-It into a third dimension, are there any other square-based connection games that can likewise be extended to three-player games? How about Slither? ~ Ed.

Fred Horn, author of the Labyrinth article overleaf, is a Dutch game player, collector, and developer. He is a specialist collector and scholar, particularly, of abstract games originating in the Netherlands. In 2007, the Stichting SP&L (Spellen, Puzzels & Ludotheek) was founded to manage his collection of over 10,000 items, and through this foundation in 2009 Fred donated his entire game collection to the Flemish Games Archive (Vlaams Spellenarchief) in Brugge, Belgium. At the moment, the collection is being sorted and documented. In addition, Fred has 30 published games, and many ideas waiting.

The original Labyrinth rules on page 41 are sparse, and needed to be interpreted, with Fred's help. The main uncertainty is what happens when a token is moved to a one- or two-dot space, to the red goal space, or to a space occupied by an opponent's token. The interpretation below is chosen for consistency and to emphasize the possibility of blocking manoeuvres.

Before the game starts, each player pays five tokens into the cashbox. The game is playable with two to six players. The players each choose one of the six pieces, in any manner they like. A player's piece starts on the first line of the board on the space that has the same colour as the piece.

For the "relay" version, the players pick a number between one and six (by choice or by rolling a die), and this number corresponds to the number of spaces a player moves her piece on each turn. For the "luck" version, each player rolls a die each turn before moving her piece to determine how many spaces she has to move.

On a player's turn, the complete number of spaces specified must be utilized to move her piece, unless the piece reaches a one- or two-dot space, the red goal space, or a space containing an opponent's token; the piece must immediately stop moving in these three cases.

After landing on a space with one or two dots, the player loses one or two turns, respectively. On the turn after landing on a space with one or two dots, a player can pay one or two tokens to the cash box, respectively, to unfree her piece. If the tokens are paid to the cash box, the player does not lose the one or two turns. A piece reaches the red goal space by finishing its turn in that space. After landing on an opponent's pieces, the opponent cannot move until after the player moves off the next turn. A player wins by getting her piece back to its home base, which does not have to be reached by exact count.

The requirement that the contents of the cashbox is split if both players reach home in the same turn implies that the game was played in a series of turns, in which each player makes a move. The winner wins the contents of the cashbox, including the five tokens each player paid into it at the beginning of the game and any additional tokens paid into it by players to unfree pieces. The cashbox presumably was an instrument for gambling, although it is clear that Labyrinth plays perfectly well without gambling.

A curious story is associated with Labyrinth. John McCallion, interviewer of Kate Jones on page 4 in this issue, sent me an email in which he asked about the letter concerning Labyrinth in AG15. I didn't think we ever received any further information, but I was just starting to check, when I received an email from Fred Horn, unsolicited and out of the blue, with the article above about Labyrinth. Fred and John swore they did not collaborate, and subsequently I introduced them to each other. The force of this coincidence was astounding. I knew then we had to write about Labyrinth in AG19, and await further developments. We are glad to provide a response to Mr. Tung, albeit 17 years later. I do hope this article somehow comes to his attention. ~ Ed.

# James Joyce's Labyrinth Game

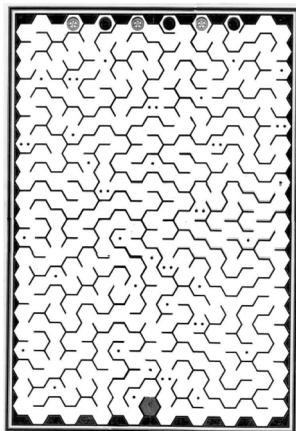
An investigation by Fred Horn



Het DOOLHOF-SPEL (The Labyrinth Game).

In 2005 I heard about a famous games magazine called *Abstract Games*. Because of my fascination with and interest in abstract strategic games it struck me hard that I had missed this one completely! After some asking around I obtained the name and address of the publisher and ordered the complete set. Sixteen issues were shipped. Subsequently, in *AG15*, from Autumn 2003, I discovered a letter from Mr. Charles M. Tung asking for information about a game:

I am a Berkeley Ph.D. candidate, writing on James Joyce's *Ulysses*. While writing one of his chapters, Joyce played a board game called Labyrinth. I have obtained a copy of the board, which I enclose.



I have not been able to find or figure out myself the rules to this game, and I would like to ask for help. The reason it is important is because Joyce discerned six errors of judgment it was possible to make while playing this game with his daughter. Do you have any ideas? Any help would be much appreciated.

Charles M. Tung, USA

In this letter, he refers to his research on James Joyce and the latter's book *Ulysses*, in which he found the game mentioned. He gave a copy of the board and the name of the game "Labyrinth." But he wanted to know more and especially how the game was played. The main reason he asked for help was that he found it important to know how, as Joyce stated, it is possible to make six errors of judgement while playing the game.

When I saw the board, I quickly recognized the game Mr. Tung was asking about as Het DOOLHOF-SPEL, a game that has been in my collection for decades. I had always thought it was a Dutch game from the late Nineteenth Century, although the set I have is not dated and neither does it include any information about the publisher. After reading Mr. Tung's letter, I began to see Labyrinth in a completely different light.

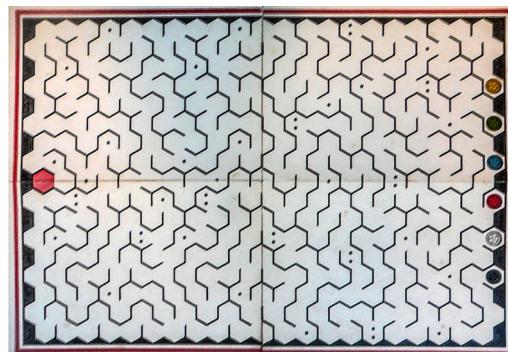


Labyrinth box and game.

Recent research by Rob van Linden (*Historical Overview of Dutch Games*, website no longer available) has given some insight into how the game entered the book. James Joyce bought a German version of the game, which was named "Labyrinth Spiel," at the Franz Carl Weber Game-shop in Zürich, located in the Bahnhofstrasse. Rumour has it that he thereafter played the game every evening with his daughter. Joyce's copy of Labyrinth is now exhibited by the James Joyce Society in Zürich.

Are we to suppose from Mr. Tung's letter that Joyce discerned six errors of judgement while playing Labyrinth with his daughter, and then these six errors of judgement somehow have correspondences in *Ulysses*? Seeking clarification in 2011, I tried to trace Mr. Tung, but to no avail. By the way, I have played the game many times, but I have no idea about those six errors of judgement.

I do hope I have made you curious about this game and its rules. For your convenience I will do my best to translate the rules from old-fashioned Dutch into modern English (see page 41). When you want to play the game, use six different coloured pawns, one die, and the reconstructed Labyrinth board on the back cover. ■



## Labyrinth Game

This party game, which 2-6 persons can take part in, has objective to find a route through the crooked paths of the labyrinth to the red endpoint and all the way back. Whoever returns first at the starting point of his journey, becomes winner.

### Regulations

Each player pays 5 game-tokens into the cashbox. The checker-discs are placed on the six starting-points and by throwing the die it is decided who begins. (That is, he, who throws the highest score.) There are two ways for play.

#### a. Relay race

In this race each player is only allowed to move [in his turn] the same number of [hexagonal] fields. The number is beforehand set by using the die or by agreement [between the players]. When a player ends his turn on a field, which is marked with one or two dots, then he has to pass for one or two turns, unless he prefers, by paying the cashbox one or two game-tokens, to redeem himself.

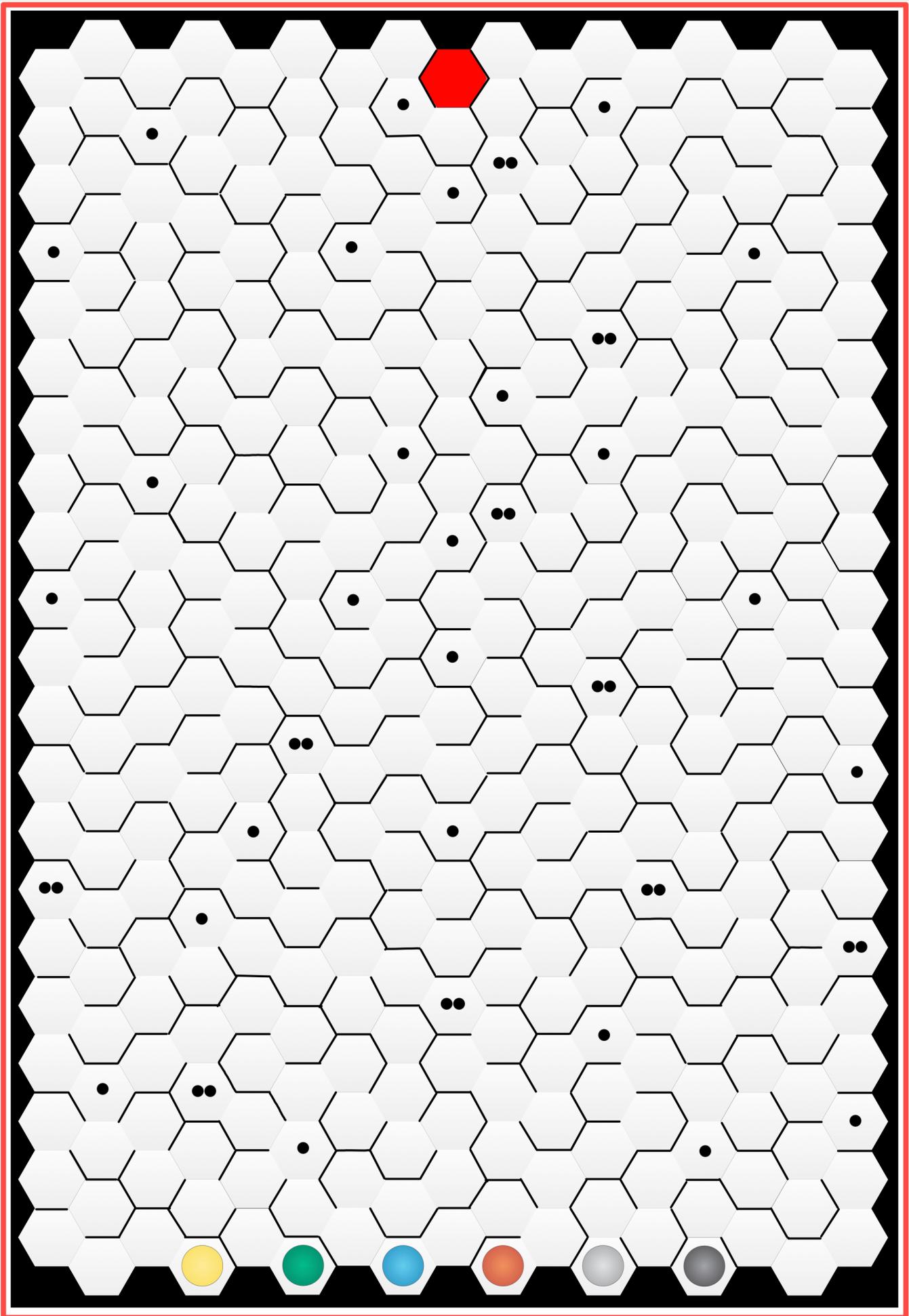
#### b. Luck race

In this race the steady movement forward is set by the die, that means, the number he throws gives the number of fields he can play forward. For the rest the same rules apply as for the relay race.

The winner of the cashbox is he who first returns to his starting-point. If more players in the same turn return, the cashbox is divided into equal parts among them.

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*James Joyce's Labyrinth Game*