Issue 12 Winter 2002
US$5.00/CDN$7.50

Abstract Games

... for the competitive thinker

~ Janggi: the Chess of Korea
~ Game Design Competition: Simultaneous Movement
~ Strategic Mancala from India
~ A Beautiful Move in Pente

Front Cover

In past issues of this magazine we have covered Dameo, Hexdame, and, of course, Grand Chess, all games from the fertile imagination of Dutch game inventor Christian Freeling. In the next issue we will have an article about Emergo, Freeling's version of column checkers. Havannah is another of his games. It is a connection game with multiple objectives; the first player to achieve one of these objectives wins the game. It contrasts well with Unlur, a game presented in this issue and in *AG11*.

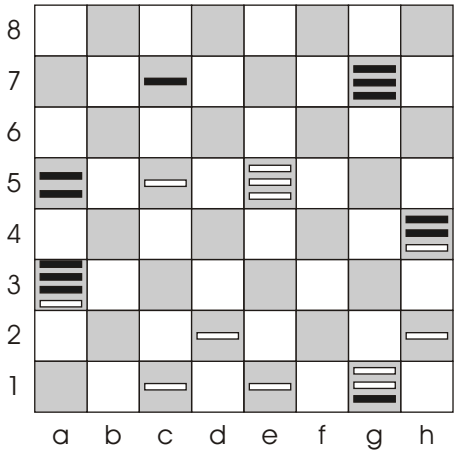
The cover shows the version of Havannah published by Ravensburger in 1981. Expert players now prefer to play on a hexagonal board with 10 spaces on each side, but otherwise the game is unchanged. Havannah is for two players, Red (or White) and Black. The board begins empty and the players, beginning with Red, take turns to place a piece of their color on an empty space. The first player to complete a Ring, a Bridge, or a Fork of pieces in his color wins the game. A Ring is a closed loop of pieces, of any shape, surrounding at least one space. It is immaterial whether the surrounded space is occupied. A Bridge is a connection between any two corner points. A Fork is a connection between any three different sides. In contrast with other connection games, a corner point in Havannah belongs to neither side that meets at that corner. Examples of these formations are shown on the board on the front cover.

Havannah has a sophisticated and varied strategy. (The elements of Havannah strategy and tactics can be found at http://www.mindsports.net/Arena/Havannah/.) According to Freeling, the perception of strategic advantage in Havannah is primarily intuitive. Humans are very good at this, but computers are very poor. In *AG10* the inventor offered a prize of €1,000 for anyone who, in the next ten years, could produce a program that could beat him just *once* in a series of ten games. So far no one has risen to the challenge. It is interesting to speculate what other games also have this kind of intuitive strategy. Perhaps Go is one—are there others? – KH

BASHNE PROBLEM

by Anatholy Zbarj

White is to play and win by blocking the black pieces. The solution is on page 29.



Contents

Publishers
Connie & Kerry Handscomb

Editor
Kerry Handscomb

Cover Photo & Back Cover Design
Connie Handscomb

Copy Editor
Alice Liddell

Contributors
Jorge Gomez Arrausi, Gary Barnes, Larry Back, Tony Gardner, Ralf Gering, Mark Mammel, Malcolm Maynard, Steven Meyers, Carl Johan Ragnarrson, Taral Guldahl Seierstad, L. Lynn Smith, Anatholy Zbarj

Game Testers
Marcello Convertini, Malcolm Maynard

Published by
Carpe Diem Publishing
Box 33018, 1583 Marine Drive
West Vancouver, BC, Canada V7V 1H0
e-mail: conniekerry@telus.net
http://www.abstractgamesmagazine.com

Subscriptions
Annual subscription (4 issues):
Canada CDN$35 (GST incl.), USA US$23, elsewhere US$26.
Back issues:
Canada CDN$9 (GST incl.), USA US$6, elsewhere US$7.
Airmail delivery included.
Checks/money orders payable to Carpe Diem Publishing (address above).
Visa/MC accepted online through Paypal.

Advertising
Rates available on request.

ISSN 1492-0492

Webmaster
Vkool Communications

Printer
Print and Run

Pre-Press
Stellar Graphics

A Note on Gender
Pronouns "he," "him," etc. have been used in many non-gender-specific situations. We realize that women play games, too, and this is merely to avoid awkward constructions such as "he/she."

Editorial

This issue marks three years of *Abstract Games*, and we are still going strong. We have a small but enthusiastic readership from around the world—enough anyway to support a compact operation like ours—and the number of readers is still growing slowly. We won't conquer the world, but it's nice to share an interest in one of the neglected byways of human activity with a group of like souls.

One correspondent mentioned to me recently that he was concerned there would not be enough material for us to keep going. Quite the opposite! Articles on Emergo, Bashne, Go variants, Steppe, Jetan, modern mancala games, Hex, and the rather strange Sleeping Beauty Draughts have been held off until the next issue—if they all fit! There'll be some surprises, too, so I haven't let all the cats out of the bag.

This issue is unusual in that we have hardly returned to games that have been covered previously. Grand Chess and Unlur are the only representatives in this regard. Instead, we have devoted a lot of space to Janggi (Korean Chess). The article by Malcolm Maynard sets down the complete rules, which, as far as I can tell, have never before been given in English. Certainly the clarification of the Facing Generals Rule is nowhere else to be found in the printed literature or on the Internet. I am sure that Malcolm will return to Janggi in future issues since we are considering a column similar to Grand Chess.

I feel it is risky giving a lot of space to this game because many Western players (and our readership is primarily North American and European) are frightened off by games using Chinese characters for their pieces. However, I am encouraged by the fact that Shogi and Xiangqi seem to be growing steadily in the West. So please don't be put off—the piece designations are really not that difficult to learn.

I expect Malcolm will soon be writing about another of his favorite Asian chess games, Mak Ruk (Thai Chess). He is still in the process of persuading me of the merits of this game. Whenever we get together he tells me that the lack of long-range diagonal pieces makes it tactically interesting. Nearly every time I lose. But it was only when I had won a game or two of Janggi against Malcolm that I began to say, "Maybe this game has potential after all." There is hope yet for Mak Ruk!

I am happy to see the "A Beautiful Move in...." series continue with Pente. I am not sure where to go with this series next, but we're open to suggestions. Perhaps a modern game such as Dvonn would be appropriate.

This issue also contains the two very playable games Orbit and Vai lung thlân. The former is a new Go-like territorial game by Steve Meyers, inventor of Anchor, while the latter is a traditional Indian mancala game that seems to be in the same class as Wari in terms of strategic interest.

"Forgotten classics" is represented in this issue by Domain. We have Steppe, Pagoda, and Universe lined up for future issues. If you have any favorite old games with interesting features or strategy you would like to share with others, then please us know.

It is time to announce the next game design competition, in what is becoming a very successful event. Last year's winner, Unlur, is attracting a lot of attention. Unlur may well come to be recognized as a great game. I am proud that the competition has thrown up a game of this caliber. Next year's competition is based on the concept of simultaneous movement. The inventor of Unlur has said that he believes there are still *completely original* game concepts yet to be developed. Why not give it a try?

Kerry

Notation

A standardized notation is used for all games when possible. In diagrams, squares are named using an algebraic system. Starting from the bottom left of the diagram, columns are identified by the letters a, b, c ... and rows by the numbers 1, 2, 3 .... A colon ":" is used to indicate captures. A threat to win, or check, is indicated by a "+" sign after the move.

Moves in Chess variants are indicated by the initial letters of the name of the piece moving together with the destination square. ("N" is used for knights, and sometimes the "P" for pawn is omitted.) Sometimes the start square is indicated to avoid ambiguity. Captures are noted with "x."

With Shogi variants we will follow the traditional Japanese way of identifying squares. From the top right, *rows* are a, b, c ... , *columns* are 1, 2, 3 .... If the value of a piece changes at the end of a move, we will use "=" and the new value; a plain "=" at the end of a move indicates a piece choosing not to promote. "+" is used for promotion in the Shogi variants (and Checkers variants). "x" indicates capture, and "x!" capture by *igui* in Chu Shogi.

Letters

Abstract Games *welcomes your views. We wish to reflect accurately the concerns and interests of the readership. Letters may be subject to editing for clarity and brevity.*

In *AG6*, p.2 Ralf Gering had some very interesting remarks on Pentagonia (see *AG2*, p.4 and *AG3*, p.2). He says, for example, that this game is like Fünfeck-Mühle and Armenian Morris mixed together. (I can add that the Armenian, Morris board with diagonal lines connecting the corners, is also quite common elsewhere.) Pentagonal Morris has been played in Switzerland for decades. In the nice little book *So gewinnt man Mühle* by Hans Schürmann and Manfred Nüscheler (Ravensburg 1980) Fünfeck-Mühle, played with 2x11 pieces on a board with five lines connecting the inner and outer pentagons, is described with sample games. It is not mentioned if this is an old, traditional Swiss game, or if it is a newer invention.

In Mongolia there is a traditional morris game, played on exactly the same game board as Pentagonia. This is named Tavan Tal (the five sides) and is played with 2x14 pieces, while Pentagonia is played with 2x15. This Mongolian game is described in an article by Assia Popova: "Analyse formelle et classification des jeux de calculs Mongols," Etudes Mongoles, Cahier 5, Paris, 1974, p.32.

One must agree with Kerry Handscomb and the Pentagonia inventor Jacob Zunti that this "is not a very original game." The rule that the jump phase starts when a player is reduced to five pieces is probably the only original feature.

I can add that Nine Men's Morris is still very popular in German-speaking parts of Switzerland, with clubs in Bern and Zürich who arrange European championships. The book mentioned above can probably still be ordered from Manfred Nüscheler, Bernastrasse 65, CH-3005 Bern, Switzerland. A strong computer program, which plays both the ordinary game as well as triangular, pentagonal and hexagonal morris, Muehle23exe, may be ordered from Richard Fischer, Langrietstrasse 10, CH-8212 Neuhausen a. Rhf, Switzerland.

Peter Michaelsen, Denmark

A letter from Peter Michaelson in *AG11* asks if the Hawaiian game Konane described by R. C. Bell in *The Boardgame Book* (1979) is a modern reconstruction of a lost game or if authentic rules are presented. It turns out this is an interesting question.

I became aware of Konane two years ago during a visit to Hawaii when I saw the stone Konane board at the Place of Refuge National Historical Park (Pu'uhonua o Honaunau). A "modern" version of Konane is taught today in the Hawaiian schools. A quick web search shows that this modern version of Konane is generally played on an 8x8 board, the squares filled with alternating black and white stones (pebbles). A black and a white stone are removed (there may be some variations concerning how these are chosen) and then players take turns jumping over opponent's pieces orthogonally to capture them. The player who has no capture at his turn loses. Thus the game is a two-player version of peg solitaire. At least one computer version of this game seems to be available.

Konane was observed in Hawaii by Captain Cook on his third voyage (Cook, 1784) but described only as being similar to draughts. This is nearly meaningless since no rules were given. In fact, the rules were handed down in Hawaii by oral tradition, and by 1924 there was just one person, a native Hawaiian woman from Kailua named Kaahaaina Naihe, who was credited with knowing these rules. In 1924 anthropologist Kenneth P. Emory interviewed Kaahaaina Naihe and wrote down the rules of Konane as told to him.

Before we get to these playing rules a description of the board is in order. This presents our first difficulty, as the rectangular playing boards (or "papamu") were of variable size. Three boards in the Bishop Museum (in Honolulu) are all 26 inches (66 cm) long but one of them has ten rows alternating six and seven holes (squares) for a total of 65; the other two have 12 rows of 15 holes each (180 squares). Some or all of the holes in these boards were originally inset with human teeth (Buck, 1964). Emory describes boards of 8x8, 9x9, 9x13, 11x11, 9x10, 10x10, 8x13, 11x13, 8x11, 13x15, 13x20, 13x13, and 15x15 (Emory, 1969). Boards were made of wood or stone. The size of the board seems to have made a difference only in how long it took to finish the game. According to Emory, Kaahaaina Naihe preferred a board with 100 squares, and this is the size board that R. C. Bell has in *The Boardgame Book* (Exeter Books, New York, New York, 1983).

For the playing rules I will quote Emory directly to avoid yet another layer of interpretation:

"In the game of konane the two players sit opposite with the papamu set end on between them. Both players participate in setting (komo) the pebbles (ili) on the dots until they are all covered alternately with the black pebbles ('ka eleele' or 'ele') and the white pebbles ('ke keokeo' or 'kea'). Then it is decided who shall pick up the first ili, which must be one at the center (piko) one laterally next to it, or one at the corner. If the first person to choose picks up a black next to the center ili, then his opponent must pick up the white center ili; but, if he picks up a black corner ili, then his opponent must pick up a white one from one side or the other of the corner. If a player removes a black at the beginning he plays with the blacks and removes the whites which he jumps. 'Lawe ili keokeo, paani ka eleele.' (Removing the whites is playing with the blacks.)

"The game now proceeds by each player jumping in turn. If a person cannot jump in turn, the game is ended, and the blocked man loses. Jumping must proceed away from or towards the player, to one side or the other, but never in two directions in one move and never diagonally. One may jump over and remove a line of men of rival color, provided there is a vacant position at the end of the line and providing none of the men are separated by more than one vacant position." (Emory, op. cit.)

According to Emory, Kaahaaina Naihe was nearly ninety at the time of his interview with her. There are several points to be made here. Of course we do not know how well Kaahaaina Naihe actually remembered the rules of the game. Also Emory's description could be clearer. There is apparently a comma missing after "(piko)." (I have not checked the original printing for differences). Apparently, from the final sentence, more than one enemy group can be captured provided the jumps are in the same direction and the enemy groups are not separated by more than one space. This rule is usually omitted from the "modern" version. More importantly, if the starting position is so standardized (a board with alternating black and white pieces), why is it seemingly vital that both players participate in setting it up, and why is there a separate term for this (komo)? Perhaps there was a social reason for specifying that both players set up the board, since Hawaiian society was stratified. This may have been the Hawaiians' way of insuring that both players were socially equal at the board—the game was not "tapu" (taboo)

for commoners, and men and women often played the game together according to Emory. But on the other hand, maybe in the original game there was the possibility of other piece arrangements. Perhaps "alternately" in the first sentence should modify "setting" rather than "covered." This could change the game dramatically. Unfortunately we will probably never know. Ultimately you must decide for yourself whether you consider Konane a lost game.

Interestingly, Bell cites Culin (1899) rather than Emory in his bibliography to *The Boardgame Book*. Bell also allows multiple captures. If anyone has access to the Culin reference I hope they will write to clarify whether Culin recites rules for Konane, consistent with Emory's above. According to Murray (1978), Culin "quotes various mentions (of Konane), none of which gives any clear indication of how it is played." Murray was apparently unaware of the 1924 edition of Emory.

Another intriguing possibility arises. The sizes of some of the Konane boards are close to Go boards. Is it possible that Konane and Go are somehow related? There do not appear to be any other Polynesian board games of that size, as one might expect there would be if there were a connection—Hawaii was one of the last of the Pacific islands to be discovered by the Polynesians. Like the Hawaiian islands themselves, Konane does not readily give up its secrets.

References

Buck, Peter H. (1964). *Arts and Crafts of Hawaii*, Section VIII (Games and Recreation).

Bernice P. Bishop Museum Special Publication 45 (reprint of the 1957 edition), pp. 369-372.

Cook, James (1784). *A Voyage to the Pacific Ocean*, vol. 3, pp. 144-145 (Volume 3 by James King). This may be in Book 4 in some editions.

Culin, S. (1899). "Hawaiian Games," American Anthropologist, New Series, I (2), pp. 201-247.

Emory, Kenneth P. (1969). "The Island of Lanai, a Survey of Native Culture," Bernice P. Bishop Museum Bulletin 12 (reprint of the 1924 edition) pp. 84-85.

Murray, H. J. R. (1978). *A History of Board-Games Other than Chess*, Hacker Art Books, Inc., New York (Reprint of the 1952 Oxford edition) p. 97, 4.11, "War-games of which we have no certain knowledge." Cites Culin (1899), p. 243.

Also see Michael D. Ernst, "Playing Konane Mathematically: A Combinatorial Game-Theoretic Analysis," http://pag.lcs.mit.edu/~mernst/pubs/konane-tr9524.ps.

Michael H. Dickman, USA

Joe Celko got a few facts wrong in his Phalanx article in *AG11*. Firstly, S.S. Kresge Co. (right spelling) is still around today (so to speak). We now know it as Kmart Corp (name changed in 1977). Secondly, Whitman did publish other "original" games. Whitman was the first to publish Sid Sackson's Focus!

Peter Loop, USA

The rules given for Phalanx in *AG11* are incomplete since they fail to address the situation where a player makes a move such that one of his own pieces is completely bordered on two or more sides by enemy pieces, or "phalanxed." In such a case the opponent simply removes this phalanxed piece at the beginning of his turn. This capture is considered to be a complete turn.

Also, a player may move a piece into danger, but then capture one of the enemy pieces that would have phalanxed his own piece. Although my copy of the rules is not specific on this point, it seems clear that this temporary phalanxing does not endanger the friendly piece.

Incidentally, my rules are dated 1964, which is prior to the 1965 publication date mentioned in the article.

Phalanx, by the way, probably does not deserve the appellation "modern classic" since a player can quickly set up a completely impregnable position and then shuffle pieces back and forth behind it. The game is thus a forced draw.

George Saunders, Canada

Readers of *AG11* who wish to try Entropy can obtain a free download from http://thad.notagoth.org, which is Thad Frogley's site. This is a zip file which yields entropy.exe, playable off-line, plus some graphics files. The program plays a reasonably strong game both as Order and as Chaos

Eric Solomon, England

I opened my *AG11* package today, and was delighted to see Feudal (an old favorite) on the cover. I used to play this with my brothers in the 1970's, and always thought it was a great game. Over the past few decades I've also played some correspondence games. It sadly never gained much of a following in the US, perhaps because of the extra preparation time, or the bother of handling the board. The clips provided that were supposed to fasten the quadrants together were not very good, and would often crack or break; and even when working properly, they produced kilters on the board. However, it is worth noting that there are 6,144 possible board combinations!

I believe the best version is two players with one set of pieces each, although occasionally positions may become static. A few times I've tried two players with two armies apiece, but it seemed to bog down the game rather than enhance it.

Tony Gardner, USA

Congratulations for your excellent magazine, which is unique in the world! It should be protected like a patrimony for mankind! What I like the most in your magazine is the fact that you dive deep into the strategy of some games and give some examples of best play.

I found, while surfing, an essential paper from J. Mark Thompson, "Defining the Abstract" (http://www.thegamesjournal.com).

Michel Vidal, France

I would like to thank you for your gracious review of Zhadu in *AG11*. I look forward to the forthcoming insights of your readers and yourself concerning Zhadu. As you've already attested to, I give special attention not only to the depth of the game-play in my designs, but to the aesthetic appreciation as well.

Also, Zhadu will now be offered via http://www.zhadu.com. Information regarding my other collections will be at http://www.rafrederickson.com.

Rodney Frederickson, USA

Correction to Hackaback Rules

It was nice to see Hackaback featured. Personally I don't think of it as a mancala game but then lots of games in *The Encyclopedia of Chess Variants* aren't chess games either!

It seems to me that your version of the rules is not totally clear regarding getting seeds home. I've rewritten a couple of your sentences and added a third to clarify this:

If during a move the home cup is reached, the player continues to sow round the board in the other row of cups. If the player still has one or more of his own seeds left to sow—at the point when he reaches the home cup—then one of these MUST be placed in it. It is never allowed to sow an opponent's seed in home.

Andrew Perkis, England

Game Review

Knockabout

Designed by Greg Lam

Knockabout is one of series of games, many of them using dice, from Pair-of-Dice Games. It is a tactical battle between dice of various shapes, reminiscent of Chase, although unlike Chase there is a small element of chance.

Knockabout is played on a hexagonal board with six hexagons per side. Completely surrounding this board is a ring of hexagons called the "gutter." Each player has two octahedral dice, three cubical dice, and four tetrahedral dice. The dice maneuver around this board, moving as many spaces in a straight line as the number they have showing uppermost. If a die runs up against another die, of either side, before it has used up all its movement points, then the moving die stops, and the die it collided with is moved on the unused number of points. This die in turn may collide with another die, and so on. The last die bumped in such a chain is re-rolled. If a die is moved into the gutter or collides with a die already in the gutter, any unused momentum is lost. Dice in the gutter must stay there for the rest of the game, but may move around the gutter in circular fashion, colliding with other dice there as usual. The objective of the game is to be the first to knock five of the opponent's dice into the gutter.

Dice with high numbers can be very powerful as they can muscle enemy dice into the gutter from some distance away. It makes sense, therefore, to set up collisions such that your own low dice are re-rolled or your opponent's high dice are re-rolled. In the initial position, with the two dice armies facing each other across the board, the tetrahedrons are at 1, the cubes at 2, and the octagons at 3. It seems to be the focus of the first few moves in the opening to bump your own cubes and octagons in the hope of getting higher numbers. Since the tetrahedrons can only go up to 4 anyway, there is less urgency in trying to upgrade them. On the other hand, dice with large numbers can sometimes be difficult to maneuver, so it does well not to have too many high-valued dice on the board. Very soon the game progresses to a wild melee in which there is plenty of scope for tactical planning. If one of your dice is being threatened, interposing another piece will not work, as the momentum will simply be transferred through the intermediary piece. Sometimes a move in the gutter is all that will work to block one of your dice from being bumped out of the ring.

The board is made of purple felt, and the two chunky dice armies are in black and yellow plastic. The game packs up compactly into a small tube. I would have preferred a wooden board, but as it is there are significant advantages in portability and price.

The blurb on the tube suggests the element of chance is 15%, and that seems to be about right. Abstract games purists should not let this deter them from giving the game a try. It seems to me that this easily portable game is ideal for play in a coffee shop or on the beach. Knockabout is a well-designed, fun game. – KH

Pair-of-Dice Games, 110 Boston Avenue, Somerville, MA 02144, USA. Website: http://www.pair-of-dice.com.
Price: US$12.50 + US$3.00 shipping and handling.

Mamba

Designed by Christophe Berg

Subtitled with the warning, "This game is alive!" Mamba is a game of amoeboid armies that battle for control of the 9x9 board. Two to four players may participate. We were only able to try the game for two, although I suspect the two-player game is the best version. Each player starts off with seven pieces, or amoebae as I like to think of them, arranged close to his side of the board.

The amoebae can slither two spaces orthogonally in a turn. They may change direction with the second space, making a *de facto* diagonal move. An amoeba can spawn another amoeba in an adjacent cell if it has no neighbors. But also, if an amoeba is so surrounded that it would be unable to move, it dies of "asphyxiation." So far the game is reminiscent of The Game of Life, but remember, this is a battle, and a line of friendly amoebae that is adjacent to a smaller line of enemy amoebae can transform the enemies to their own slimy cause. (Each piece is round with a projecting pseudopodium that points to the player that controls it. It may be rotated to show ownership by another player.) However, if a line is greater than five amoebae long, those at the end die through "overcrowding." A player wins by reducing the opposing army to four or fewer members.

The actions of birth, movement, death by overcrowding, death by asphyxiation, and transformation can obviously affect each other. For example, a move can create a line ready to transform an enemy line, but this same move may also create a death by overcrowding that destroys the line. In this case, death must take precedence over the transformation, which will not then occur. To prevent confusion, there is a rigid order in which the various actions of the game must be performed.

There are clearly a number of interesting tactical elements to the game. For example, a combination of birth and movement can quickly create an attacking line almost from nowhere. Or you may move a piece so that an enemy dies of asphyxiation, and then perhaps this weakens an enemy line so that you get a transformation. But be aware that a transformation may kill some of your own pieces through overcrowding. Sometimes the effects of a simple move can reverberate around the board, with far-reaching consequences.

Strategically, it makes sense at the start of the game to spread out one's army as much as possible so that they may give birth to new pieces. Actually, we were unable to formulate any strategy aside from this simple one of spreading over as much of the board as possible. Mamba struck me as being quite similar in feel to the old game of Guerilla by David Wells. In Guerilla there seemed to be a lack of strategic depth, despite the excellent conception of the game. To be fair, however, our play testing of Mamba was of necessity insufficient to investigate the game in any great depth, and strategic ideas may well emerge with greater familiarity with the game. In any case, the tactics of Mamba are varied and interesting, certainly more so than those of Guerilla. With some (all?) games true strategy can only emerge after adequate tactical familiarity. In Mamba there is a real fascination in watching one's colony of "living" pieces battle across the board in a struggle of life and death. We enjoyed this game; it is worth a try. – KH.

Toodoo Editions, Hôtel d'entreprises, 5 rue de la Trinquette, 17000 La Rochelle, France.
Website: http://www.mambagame.com.
E-mail: info@toodoo.net. Price: €34.00.

Book Reviews

The Zen of Magic Squares, Circles, and Stars
An Exhibition of Surprising Structures across Dimensions

Clifford A. Pickover
Princeton University Press, Princeton, 2002.

I have not thoroughly read all of this densely written volume of 405 pages, although I have dipped into it many times. It is an amazing book. As I write this, I randomly open the book to a description of Meyers' Eighth-Order Magic Cube, for example, to find the comment, "Think of this magic cube as a hunk of precious cheese whose internal symmetries are produced by a mathematician dairy farmer high on LSD." And then, intrigued, I read a little about the incredible properties of this mathematical delicacy.

A magic square is a grid of numbers, each of whose rows columns and diagonals totals the same number. Of course, there are many other interesting properties that a magic square may have. Also, the magic square concept can be applied to a host of other shapes, or may be extended into three or more dimensions.

One of the most appealing aspects of this book for me is the unusual perspective from which it is written. Pickover writes,

"These patterns are koans for scientific minds. I enjoy meditating on them.... Arithmetic satori *[enlightenment] is the psychological result and aim of the practice of magic square meditation. At the risk of appearing overly mystical, let me quietly say that this practice induces an awareness, and experience of joy emanating from a mind that has transcended its earthly existence. Experience is no longer mediated through concepts.... The existence of a separate self is viewed as a fiction."*

Hence the title's reference to Zen is most appropriate. I began to wonder whether an analogous "ludic satori" was possible. I had heard that some Zen monks used Go as part of their spiritual practice. Perhaps this rumor was true after all. Perhaps the joy of game playing is a foretaste of enlightenment. Certainly there is a kind of beauty in games as there is beauty in the mathematical structures that Pickover is describing, and the very best games for me are those that invite an intuitive approach to strategy in addition to detailed tactical analysis.

However, this book is not a hodge podge of flaky ideas. It seems to me that it is an in-depth scholastic investigation of the history and theory of magic squares. The mathematics is detailed and rigorous, although within reach of a reader with no more than high school mathematics. The author clearly delineates the open problems, so that it would be possible for a reader to tackle real unsolved problems after studying this book.

Although this book is not about games, it should appeal to many of the types of people who appreciate abstract games. It might even inspire ideas for new games. I recommend it. – KH

Correction

On p. 14 of *AG11* the second Kyoto Shogi diagram has a *tokin* upside down: the *tokin* on 2c belongs to White, not Black.

장기 Janggi

The Chess of Korea

by Malcolm Maynard

Janggi (Korean Chess) is a game little known outside of the Korean peninsula. Janggi, as far as can be determined, evolved from Xiangqi (Chinese Chess), although for lack of records, there seems to be no clear idea exactly when or how it was that Janggi appeared. To those familiar with Xiangqi, Janggi may seem much the same game. However, the differences in rules make for two quite different games, despite the obvious similarities.

When I found out about the game of Janggi, I sought out as much information on the game as I could find. Stemming from the fact that Janggi does not enjoy as much prestige in Korea as Shogi in Japan or Xiangqi in China, there was very little written on the game in English. However, thanks to the Internet, I was able to gather a modest amount of information from what few web sites could be found on the topic. Also, I was able to contact some Korean Janggi enthusiasts who could understand English and who were kind enough to show me what they could of the game.

Since Janggi is such a fine game in its own right, I thought it a pity that there was so little information available on the game in English. I will therefore try to redress that by presenting the rules of Janggi, as well as giving you some idea of how to play the game properly.

How To Play Janggi (Korean Chess)

This article is intended for those who have never come into contact with Janggi. Any references here to Xiangqi are intended as a matter of interesting trivia for those familiar with that game and otherwise have no bearing on the information on Janggi.

The Pieces

The playing pieces in Janggi are not figurines, as you would find in Chess. Instead, they are flat octagons with Chinese ideograms carved into their surfaces. The ideograms are somewhat different for both players, so each player could still tell which pieces belonged to him after the colored paint had worn off—quite a common occurrence before the advent of plastic.

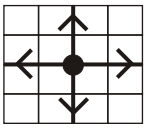
There are three different sizes of pieces—the largest and thickest piece is each player's General, the smallest and thinnest are the Ministers and Pawns, and the middle-sized ones are the Rooks, Cannons, Horses and Elephants.

Each player is either the *Cho* or *Han* "country." Traditionally, *Cho* pieces had blue or green ideograms and *Han* had red. I will show *Cho* pieces as black on white and Han pieces as white on black.

The movement of each piece is illustrated with a stylized diagram. This is intended as a mnemonic. Starting point and destination point are represented by large and small dots, respectively. Unlimited movement in a direction is shown with an arrow. The fact that the Cannon needs a "screen" is represented by dotted lines. The moves of the Rook, Cannon and Pawn within the "fortress" are not shown.

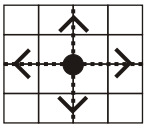
Rook (*Cha*)

The Rook moves any number of unobstructed points orthogonally (that is, horizontally or vertically). It captures by landing on the first opposing piece in its path of movement. However, the Janggi Rook can also move along the diagonal lines within either player's fortress on the board (see board description). The Rook is the most powerful attacking piece in Janggi.



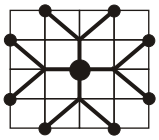
Cannon (*Po*)

The Cannon is similar to the Rook, but can only move or capture by jumping over a "screen" piece of either player. A Cannon can neither jump over nor capture another Cannon. The Cannon can also move along the diagonal lines of either fortress (see board description), which means a screen must be in the central point. Neither player can move a Cannon on his first turn. Less powerful than the Rook, the Cannon is difficult to master. It is used for both offence and as a defense against opposing Cannons.



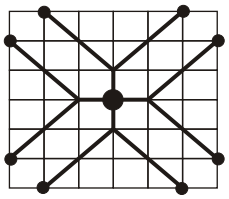
Horse (*Ma*)

The Horse moves one point orthogonally and then one point diagonally forward from its point of origin. It is similar to the Knight of Chess, but the Horse *cannot* jump over any intervening pieces. Each player can vary the starting position of either of his Horse pieces prior to play.



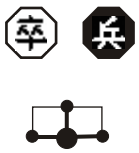
Elephant (*Sang*)

The Elephant moves one point orthogonally and then *two* points diagonally forward from its point of origin. The Elephant cannot jump over any pieces in its path. Since its path is so easily blocked, the Elephant is a relatively weak piece. Unlike Xiangqi, the Elephant in Janggi is not restricted to its own side of the board and can therefore be used for both offence and defense. Just like the Horse, each player can vary the starting position of either of his Elephant pieces prior to play.



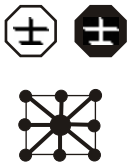
Pawn (*Jol*)

Actually referred to as the "Soldier," we will use the more familiar term "Pawn. The Pawn moves and captures by moving one point forward or sideways and cannot move backward. A Pawn reaching the furthest rank on the board can only move sideways. The Pawn can also move forward along the diagonal lines of the opposing fortress (see board description). The Pawn is a strong defensive piece. Two or more Pawns beside each other prove to be a stout obstacle! A player does not want to lose too many Pawns!



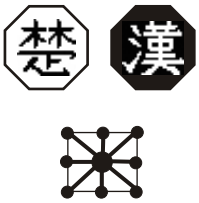
Minister (*Sa*)

The Minister moves along any orthogonal or diagonal line within a player's fortress. The Minister is unable to leave the fortress and is strictly a defensive piece. While similar to the Xiangqi Guard, the Janggi Minister has much better mobility.



General (*Gung*)

The General is the equivalent of the Chess King. The objective of Janggi is to trap the opposing General. The General's movement is identical to that of the Ministers, able to move along any orthogonal and diagonal line within the fortress while confined to it. Unlike Xiangqi, opposing Generals *can* face each other across the board. However, this is a forced draw or stalemate, rather than a win or loss, as in Xiangqi.



The Board

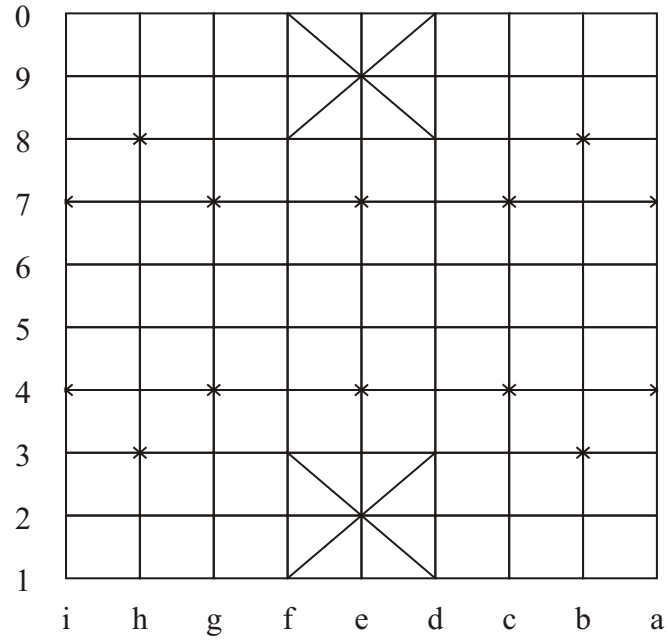
The board of Janggi is a grid of 9x10 points. Unlike Xiangqi, there is no "River" dividing the board. The lack of a river means that there is no promotion (of Pawns) or restricting the Elephants to one side of the board.

The "fortress" of either side is the 3x3 grid with an "X" pattern, marking where the General and Minister pieces are restricted to throughout the game. All other pieces in Janggi can move anywhere on the board.

There are 14 small "x" markers on the board as well. These are simply to show each player where his Pawns and Cannons are to be placed on the board and make the set-up faster. They have no bearing on play. However, players often use these points for orientation, just as you would with landmarks.

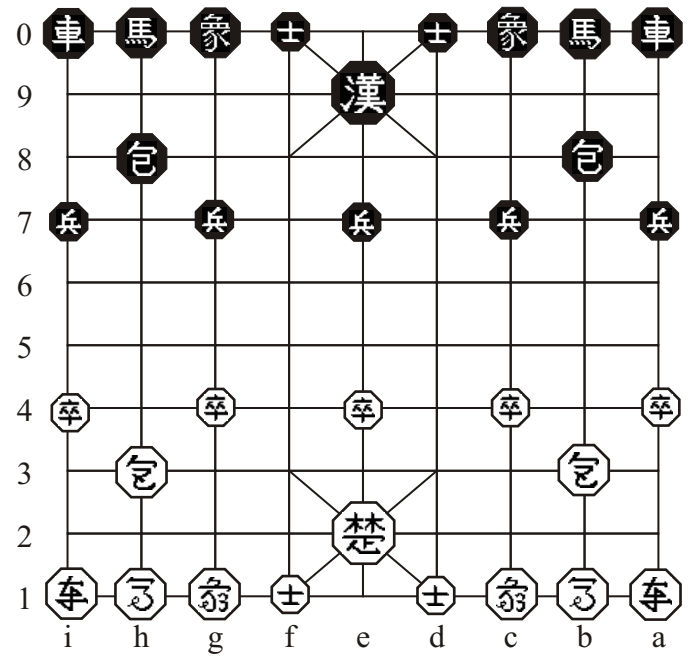
Just as with Xiangqi, the pieces in Janggi are played on the intersections on the board, not within squares, as you would have in Chess. A slight refinement of Janggi over Xiangqi, though, is that the pieces, within their limits of movement, can move along the lines on the board. This results in the increased powers of Generals, Ministers, Rooks, Cannons and Pawns within fortresses. It is a very logical extension of the movement of the pieces.

Traditional Janggi boards are oblong, with the width greater than the breadth. The rationale is that it is thereby easier to reach pieces at the opponent's end of the board. For recording games the rows and columns are assigned numbers and letters according to standard forms of notation for Janggi games in Korea.



Janggi Board

Initial Set-Up



Default Set-Up

The initial set-up for pieces in Janggi, as shown above, is similar to that of Xiangqi. The most obvious difference is that the General for each player does not start on the back rank of the board, but the more vulnerable central point of the fortress.

Further, prior to play, players can, if desired, alter the placement of their Horses and Elephants, as explained below. This is also done in the order of movement. That is, *Cho* sets up, then *Han*, and then play commences with *Cho* making the first move.

Neither player is obliged to make changes to this default set-up, of course. But the exact kind of opening moves you will make are heavily dependant on the kind of initial set-up you choose prior to play.

Optional Set-Up for Horses & Elephants

In Janggi, players can change the arrangement of their Horses and Elephants. Before play begins, each player can swap either, neither or both pairs of Horse and Elephant on either side of his fortress. This is done at the whim of each player before play actually starts. *Cho* makes his changes, if any, first, then *Han*. Play can now begin, with *Cho* moving first.

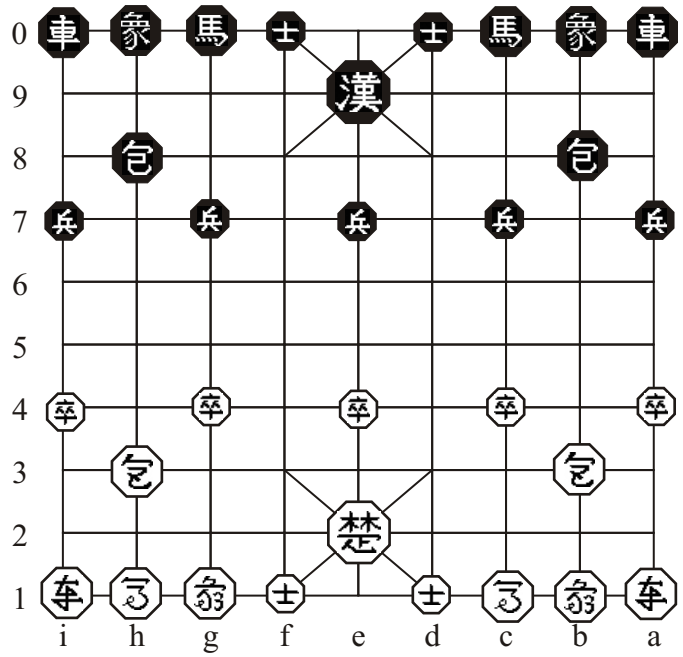
This leaves each player with four options of set-up. The kind of opening moves that each player will make depends on the choices both players made in arranging their Horses and Elephants before play begins. Each has its own advantages and drawbacks. These are as follows:

I. Twin Ma: From left to right, Horse, Elephant, Elephant and Horse. This is identical to the Xiangqi set-up. This allows for the fastest development of your Horses, allowing them quick access to the opponent's side of the board, with your Elephants in strong defensive positions. This is the default set-up for both players, shown above.

II. *Twin Sang*: From left to right, Elephant, Horse, Horse and Elephant. This allows for speedier development of your Elephants, although your Pawns on either flank will lack their protection. This is the set-up for *Han*, below.

III. *Ma-Sang-Ma-Sang*: From left to right, Horse, Elephant, Horse and Elephant—often referred to as "mixed forces." One of each is in a strong defensive position and poised for speedy development. This is the set-up for *Cho*, below.

IV. *Sang-Ma-Sang-Ma*: From left to right, Elephant, Horse, Elephant, Horse. This is the same as *Ma-Sang-Ma-Sang*, simply with the Horses and Elephants in the opposite order.



Examples of Set-Ups
Han *has* Twin Sang, Cho *has* Ma-Sang-Ma-Sang

Game Notation

The notation used here is basically the same as that used for other chess-type games in this magazine, but draws on the standard forms of notation for Janggi games in Korea for labeling the points. The ranks are numbered from 1 to 0 (instead of 10) from top to bottom, and files are numbered from left to right from the perspective of the Han player. The only other notation we have to add to this is something for the optional set-up of the Horses and Elephants prior to play. For example, Hbg means the player's Horses start on the *b/g* files (so his Elephants start on the *c/h* files).

Objectives of Janggi

The objective of winning a game of Janggi is much the same as any other kind of chess: Trap or checkmate the opposing General.

Checkmate

This is to simply to trap the opposing General in a position where it cannot avoid being captured the next move. In some ways, this can be easier to achieve than in Western Chess, since the General is severely restricted as to where it can move on the board. For those familiar with Xiangqi, a checkmate in Janggi can be a bit more difficult than in that game because of the greater mobility of both the General and Ministers.

Draw

The forced draw, or *bigjang*, rule of Janggi allows players in an otherwise hopeless position to salvage a draw out of a game, rather than lose. In *bigjang*, if both Generals are left on the same file without any intervening pieces of either player on that file, then the game is a forced draw.

In tournament play, the *bigjang* rule is somewhat different, to reduce the number of draws. In tournaments *bigjang* also requires that *both* players must also have greatly reduced forces. Namely, both players must have less than 30 points of pieces based on the following values: Rook 13 points, Elephant 3 points, Cannon 7 points, Minister 3 points, Horse 5 points, Pawn 2 points. Otherwise, both Generals on the same file with no intervening pieces has no effect.

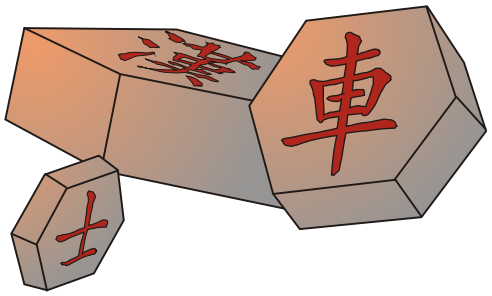
It is elsewhere reported that these piece values are used in tournament play in drawn games, presumably when neither player is able to capture the General of his opponent. In this case, the player with the greater total piece value remaining on the board wins the game. The Cho player must deduct 1.5 points from his total for moving first (Cazaux).

Endgame Problems

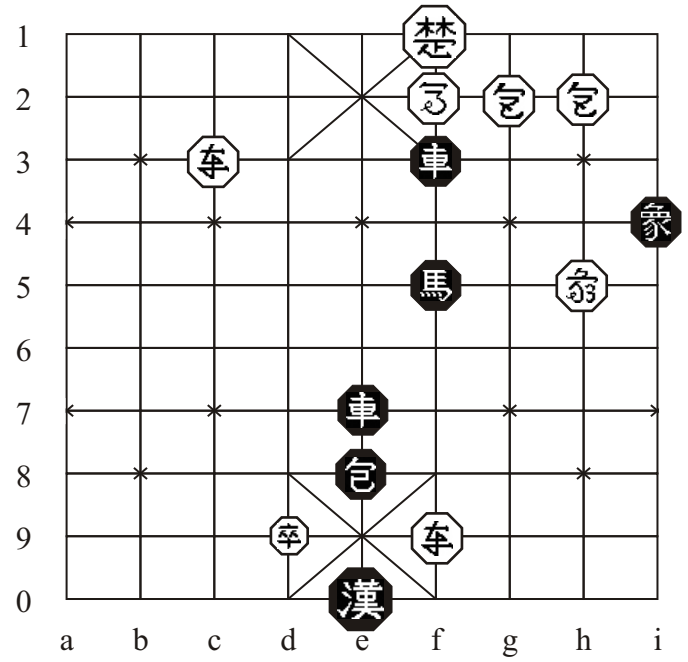
In Janggi mating or endgame problems, or *bakbo*, are just as popular as they are with other forms of chess. Books are published in Korea devoted solely to these problems. The conventions for *bakbo* are as follows:

- The *bakbo* is viewed from the *Han* side of the board (so the board is reversed).
- *Han* moves first and is the player to win.
- All moves force the *Cho* player to make a certain move to allow *Han*'s win.
- *Han* is just one move away from being checkmated at the start.

The following two examples are not very complex, but do give you an idea of the format of *bakbo* problems. One is a straightforward win by *Han*, and the other is meant to illustrate how the *bigjang* rules work since *Han* salvages a draw out of what would have otherwise been a defeat:

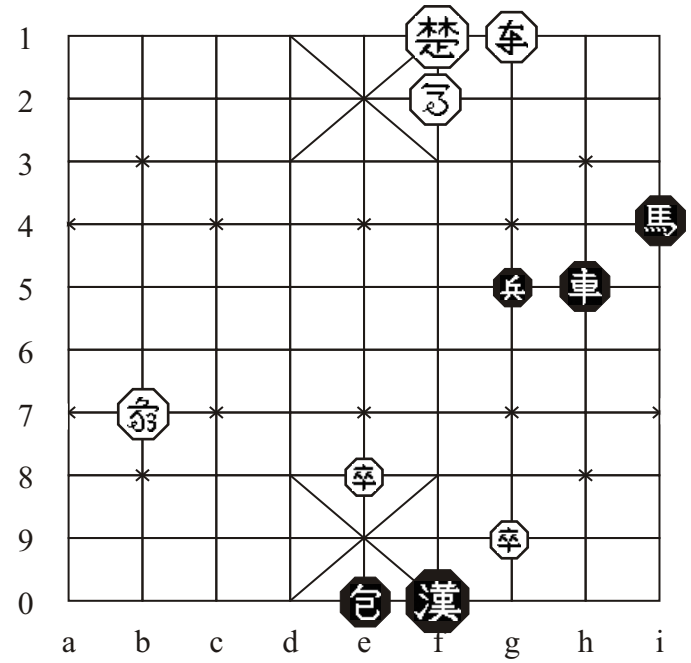


Problem 1



1.Rd1+ Hxd1, 2.Re1+ Gxe1, 3.He3 + Ee7, 4.Ce4 mate.
This is a nice little *bakbo*. *Han* sacrifices both Rooks to trap the *Cho* General in front of a Horse and Cannon formation. The *Cho* General cannot move sideways because of the *Han* Horse and capturing the *Han* Horse is pointless for *Cho*, since the Cannon can leap over that piece to capture the *Cho* General. Using Horses and Cannons like this seems to be common in *bakbo* problems.

Problem 2



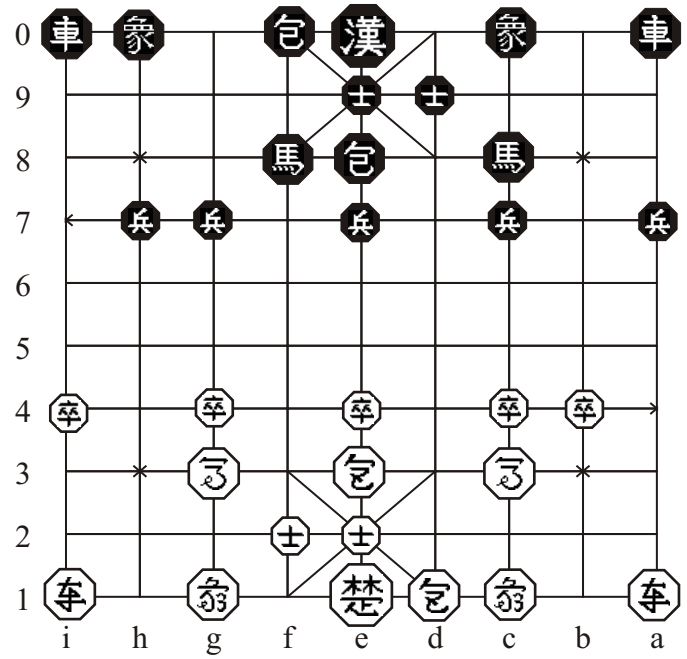
1.Hg3+ Rxg3, 2.Rh1+ Hxh1 draw
Han salvages a draw out of what should have been a loss. By checking *Cho*'s General with his Horse, *Han* forces *Cho* to move his left Rook, since *Cho* cannot move his General. By following up with a check with his Rook, *Han* forces *Cho* to capture the Rook with the Horse on f2, leaving both Generals to face each other unopposed, forcing a draw per the *bigjang* rules. Had *Cho* responded with Rg2, *Han* would soon win with Rh1, so *Cho* is then forced to settle for a draw rather than a certain loss.

Openings
Like any form of chess, one of the most important parts of a Janggi game is the opening. Setting up a proper defense, which we can call *castling* (even though there is no specific castling move) is critical if you want to launch an effective attack on the opposing fortress. You do not want to start castling too soon, since that would slow down any attacks you might want to launch. And you do not want to castle too late either, since that would make things much easier for your opponent! The typical sequence of moves to castle and ready an attack in Janggi would take the following form:
- Move one of your side Pawns toward the center to allow an open file for one of your Rooks to move through. Choosing which Pawn to move is very important.
- Move up one of your Horses to allow your Cannons to move. The choice of which Horse to move is very important too.
- Move one Cannon directly in front of the General.
- Move the General to the back row of the fortress and move both Ministers forward to the second row, making sure one of the ministers occupies the central point of the fortress.
- Move your second Cannon to the back row of the fortress to protect your General.

Avoid making the mistake of thinking that if you rush your attack, you can kill the opposing player who is setting up a castle. This will inevitably cost you an unfavorable exchange of pieces, leading to defeat.

The following basic opening should serve as a good example: **1.Hbh Hbg, 2.P(a4)b4 P(i7)h7, 3.Hc3 Hf8, 4.C(b3)e3 C(h8)e8, 5.Ge1 Ge0, 6.M(d1)e2 M(f0)e9, 7.M(f1)f2 M(d0)d9, 8.Hg3 Hc8, 9.Cf3 Cd8, 10.Cd1 Cf0**

This shows castling as well as a different choice of Horse and Elephant set-ups for both players. Note that *Han* might be vulnerable to *Cho* attacking his right Rook with a Cannon, unless he moves up his right Rook or Elephant.



Example opening

This example opening makes the somewhat unrealistic assumption that both players will be happily castling while not

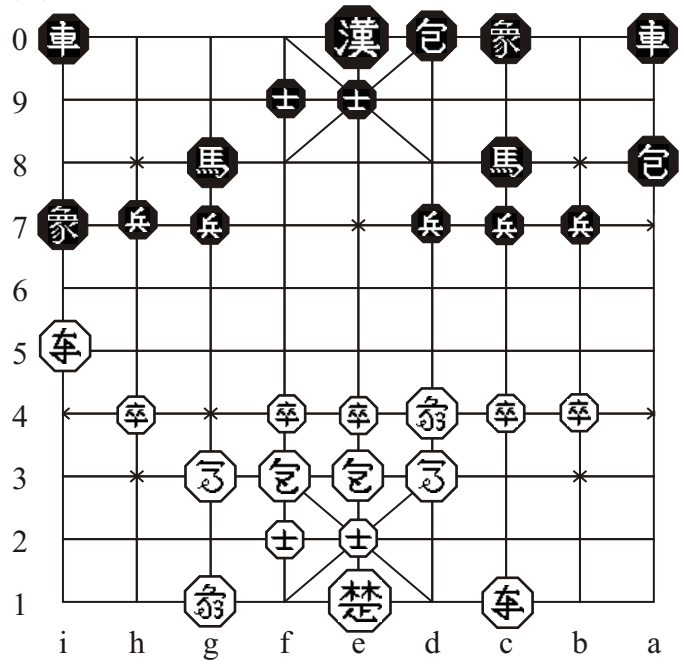
bothering to attack all the while. Even so, it does illustrate some of the most commonly used opening moves in Janggi. While you do not need to stick to this opening sequence rigidly, if you follow this general pattern of Janggi castling, you will be on your way to a competent opening game.

The openings of Janggi are not nearly as explosive, nor as aggressive, as those in Xiangqi. The game itself, though, has more tactical richness than Xiangqi, in my humble opinion.

Example Game

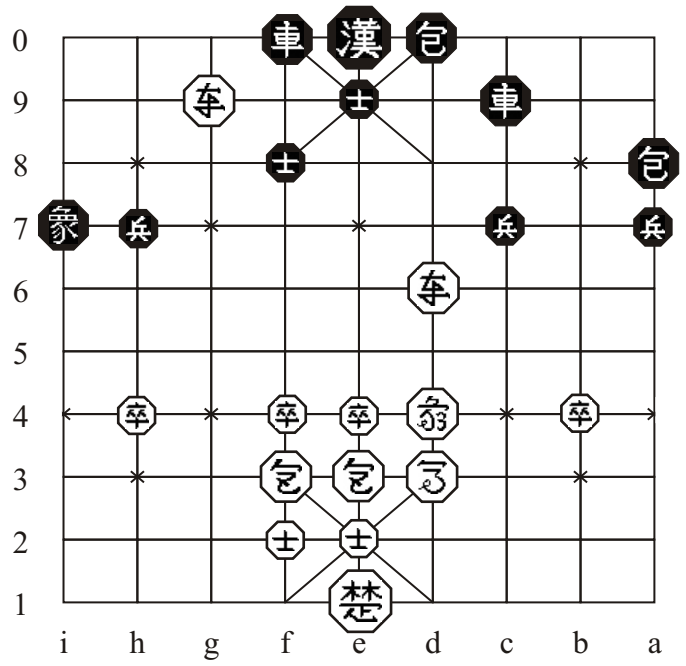
This example game is recent game played between Kerry Handscomb (*Cho*) and myself (*Han*). This game should serve as a good example to people new to Janggi. Kerry and I both made some silly mistakes that new Janggi players typically make, as well as some reasonably good moves too.

1.Hch Hbh *(*Cho *chooses* Ma-Sang-Ma-Sang *mixed forces and* Han *elects to use the* Twin-Ma *set-up.)* **2.P(a4)b4 P(i7)h7, 3.Hg3 Hc8, 4.Hd3 C(b8)e8, 5.C(b3)e3 Hg8, 6.Cf3 Cf8** (*Both sides have used their Cannons to block the threat of the opponent's Cannons to their fortresses.)* **7.Ed4 Ei7, 8.P(g4)f4 Ge0, 9.Ge1 M(d0)e9, 10.M(d1)e2 M(f0)f9, 11.M(f1)f2 Cd0, 12.Rh1 Ch8, 13.Ri1 Cd8, 14.Ph4 Ca8, 15.Rc1 P(a7)b7** *(After easily avoided threats to both of* Cho*'s Rooks,* Han *opens up the file for his left Rook.)* **16.Ri5 P(e7)d7?**



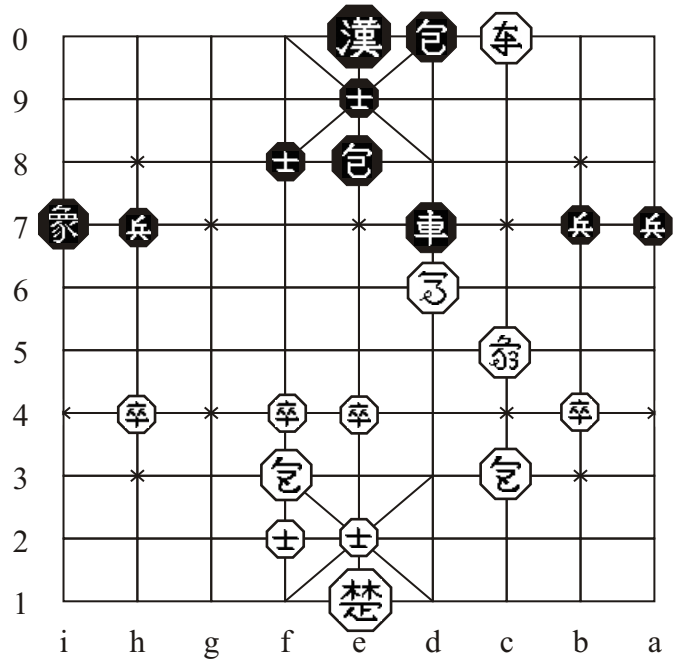
Position after 16....P(e7)d7?

*(*Han *has compromised his center, which is now weak.)* **17.Pc5 H(c8)e7, 18.Pc6 Hg6, 19.Rg5 Pxc6, 20.Rxc6 P(d7)c7, 21.Ra6 Ea7** *(*Han *threatens* Cho*'s Rook with Cxa6.)* **22.Rd6 Ca1** (Han *threatens Cxg1, then Cxg5.)* **23.Cf1** *(*Cho *counters this with his left Cannon, protecting his right from any intrusion by* Han*'s left Rook.)* **23....Ca8, 24.Ei4 Rc0** *(*Cho*'s center is now more solid than* Han*'s)* **25.Hf5! Rh0** *(*Cho *threatens a strong breakthrough on* Han*'s left with his Horse on f5 and Elephant on i4.)* **26.Exg7 H(g8)e7** *(*Han *attempts to stall this attack by linking both Horses.)* **27.Hxe7 Hxe7, 28.Cxe7+ M(e9)f0** *(*Han *is now in rather poor shape and vulnerable, with neither Cannon in a good position.)* **29.Ce3+ M(f0)e9** *(*Cho *enjoys a much more solid fortress than* Han*!)* **30.Ed5 M(f9)f8** *(*Han *is now behind in material, and has to defend against the threat of Rg8.)* **31.Exa7 Pxa7, 32.Rg9 Rf0, 33.Cf3? Rc9**



Position after 33....Rc9

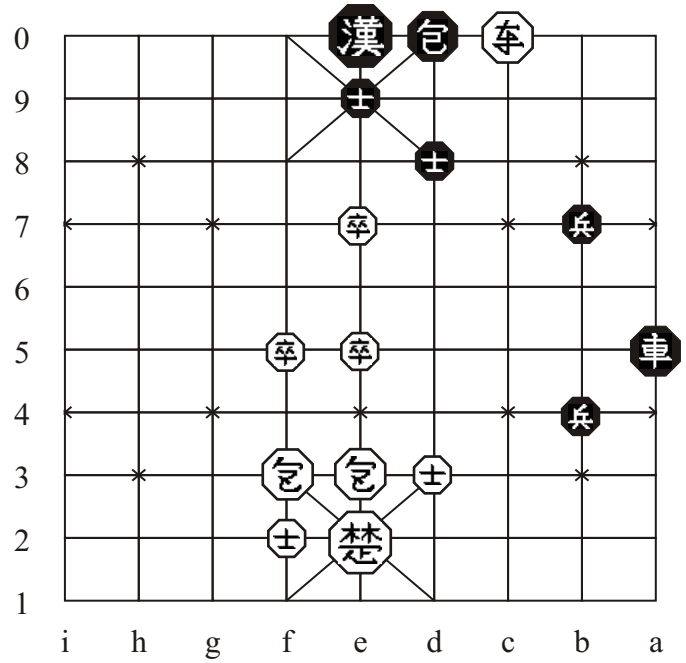
*(*Cho *should have moved Ce5+!, since* Han*'s General is now unable to move at all.)* **34.Ef7 Rc8** *(*Han *is still on very shaky ground here!)* **35.Rd9 Ce8** *(*Han *is forced to defend with a Cannon to prevent R(e9)xd9 or R(g9)xe9, which* Han *would be unable to overcome.)* **36.Ra9 P(c7)b7** *(*Cho *has now left* Han *with a slim chance of countering with his Rook on c8.)* **37.Ec5 Rc6, 38.Cc3 Rd6** *(*Han *is still reduced to using a Rook to block Exe8.)* **39.He5? Rg0** (Cho *has given* Han *a chance to take some pressure off.)* **40.Rxg0 Cxg0** *(Now* Cho *cannot move Ra0+ because of Cxa0.)* **41.Hf7 Rd7** *(*Han*'s lone Rook still is not in a good position.)* **42.Rc9 Pg7, 43.Hd6 Cd0, 44.Rc0**



Position after 44.Rc0

*(*Cho *prevents Cxd6, but allows* Han *to move his other Cannon,*

now threatening Rxd6.) **44....Cg8, 45.Hf5? Exf5** *(*Cho *errs, and* Han *captures his Horse, bringing* Han *closer to being even with* Cho *in material.)* **46.Pxf5 Rd5, 47.P(e4)e5 Rd4!** *(*Han *can now capture one more of* Cho*'s Pawns at will and make his Rook a real threat.)* **48.Ph5 Rh4, 49.P(h5)g5 Rxb4** *(*Cho *wants to prevent Cg1.)* **50.Md3 Rb1+** *(*Cho *has to move to prevent Rb3, but this does split fortress defenses.)* **51.Ge2 Rb2+, 52.Md2 Ce8??** *(*Han *blunders!! A* real *threat would have been Md9, to threaten Rxd2+.)* **53.Exe8 M(f8)xe8 54.Pf6 Rb5, 55.P(g5)f5 Pa6, 56.P(f6)e6 Pf7?** *(*Han *is wasting one of his few Pawns here!)* **57.Md3 Pa5, 58.Ce3 Pa4** *(*Han *is now struggling, haven fallen behind in both material and position once again.)* **59.Cxf7 Pb4, 60.Pe7 M(e8)d8, 61.Cf3 Ra5**



Position after 61....Ra5

*(*Han *finally notices the weakness in* Cho*'s fortress!)* **62.Pf7? Ra2+** *(Rather than repair his fortress' defenses,* Cho *elects to threaten, which allows* Han *a chance to attack again.)* **63.Gf1 Ra1+, 64.Ge2 Rb1, 65.Pe6? Pb3** *(*Cho *would have been much better off to move Cd1, to eliminate the potential threat from* Han*'s Cannon on d0.)* **66.Pf8? Rb2+** *(*Cho *elected to attack again, leaving* Han *free to attack.)* **67.Md2? Rxd2+** (Cho*'s General is now trapped by* Han*'s Rook, which is now backed up by his Cannon.)* **68.Gf1 Rd1 mate.** ■

Acknowledgements

I would like to give special thanks to Mr. KyoJin Kim of Korea, amateur 3-dan Janggi player and author of the *"Janggi Dosa"* software program, for his patience in answering my questions about the rules and conventions of Janggi. I probably could not have ascertained the correct rules were it not for his help.

A taxi dispatcher by trade and born in 1960, Malcolm is a long time game enthusiast. He played Western Chess quite often during his school years, not realizing that there were other forms of the game out there. But, in 1990, he stumbled upon Xiangqi and then started playing Shogi in the Vancouver Shogi Club in 1992. Since then, he has tried to learn as much as possible about other traditional or regional forms of chess. Malcolm started a forum for discussion of Janggi at http://groups.yahoo.com/group/Janggi/.

Malcolm and I are regular across-the-board opponents, and we have played more Janggi over the last few months than any other game. At first I was skeptical, preferring Xiangqi, but gradually the logic of Janggi took hold. Now I prefer the Korean game.

Xiangqi sets, available very cheaply in any Chinatown, are perfectly serviceable for Janggi, but in Korean areas in the larger cities you may well be able to find a real Janggi set. A word to readers who have yet to try the East Asian forms of chess: The piece symbols are not that difficult to get used to—don't let them prevent you from trying these great games!

Malcolm is currently working to convert me to Mak Ruk (Thai Chess). At first it seemed a little tame compared to Western Chess, but maybe there's something to it after all.... – Ed.

Bibliography

Cazaux, Jean-Louis. "Changgi." 2000. http://www.chessvariants.com/oriental.dir/koreanchess.htm

Culin, Stewart. *Korean Games With Notes on the Corresponding Games of China and Japan*. 1895. Mineola, NY: Dover Publications, 1991.

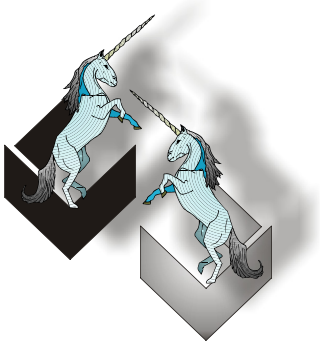
Golon, John. *Chess Variations Ancient, Regional and Modern*. 1st edition, 3rd printing. Tokyo: Charles E. Tuttle Co., 1968.

Horne, Malcolm. "Korean Chess." *Variant Chess* 17 (1994).

Horne, Malcolm. *Korean Chess Extra*. 1995.

Horne, Malcolm. "Chess In Korea." *Variant Chess* 38 (Summer 1998): 153-155.

Martin, Roleigh. "The Rules for Korean Chess." Applied Foresight Inc. 1995. http://www.xmission.com/~gastown/afi/koreanch.htm.



The History of 3D Chess

Part Three: Through the Looking Glass

by L. Lynn Smith

With the end of World War II the game of 3D Chess began slowly to return to the consciousness of the public. There were several attempts to resurrect the pre-war versions. Though Kogbetliantz waged a huge media campaign in the United States, his game met with little enthusiasm from the Chess-playing public. Maack's 5x5x5 game of Raumschach continued to have its small, but loyal, core of followers. But there were others, who developed unique 3D rules, pieces and playing fields. One of the most creative and prolific of these was Vernon Rylands Parton.

Alice Chess

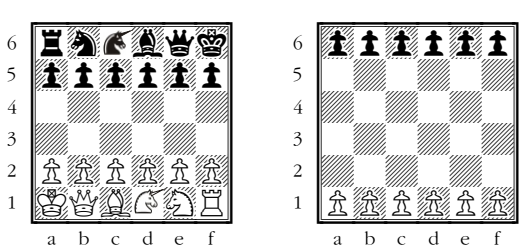
In 1945 Parton invented the game of Alice Chess. Readers may refer to *AG8* for a short biography of Parton together with the rules of Alice Chess.

Since corresponding squares in the two levels of Alice Chess both cannot be occupied by pieces at the same time, it is possible to play Alice chess on one board—it is simply necessary to indicate which level a piece is on by marking it some way, say by placing checkers under pieces on Level B. Indeed, some would try to deny that Alice represents a 3D game. Nevertheless, in conception the action takes place on and through two separate 2D playing fields, so it qualifies. Alice has been a great favorite among chess variant fans and deserves its place in 3D Chess history.

V. R. Parton did not stop with this game. In his booklet *Chessical Cubism or Chess in Space*, he presented several more 3D games.

Cubic Chess

Parton's Cubic Chess utilizes the 6x6x6 playing field. The players arrange their forces upon the bottom two levels.



Levels C, D, E, and F begin the game empty.

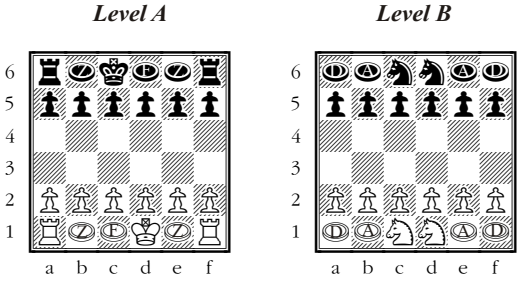
Starting position for Cubic Chess

The pieces all have their classical Raumschach moves, except for the Pawn. The Pawns have a unique form of movement. They step one cell forward, either orthogonally, diagonally, or triagonally. They both move and capture in this fashion.

Checkmating the King is the standard win, but Parton also suggests two other forms for this game. In Compulsory Cubic Chess the player must perform any capture that presents itself; the player is free to choose if two or more captures are possible. In Scacia Cubic Chess the win scenario is changed from the mere checkmate of the King to the complete capture of the opponent's entire force, with capturing also being mandatory.

Tamerlane Cubic Chess

This game introduced several unique 3D pieces. Although the Dabbaba, Alfil, Zurafa, and Ferz have classical origins, Parton was the first to apply them to the 3D playing field. As in standard Cubic Chess, the players arrange their forces on the bottom two levels.



Levels C, D, E, and F begin the game empty.

Starting position for Tamerlane cubic Chess
A=Alfil, D=Dabbaba, F=Ferz, Z=Zurafa

The Bishop, King, Knight and Pawn move as in standard Cubic Chess. The Alfil leaps to the second diagonal cell. The Dabbaba leaps to the second orthogonal cell. The Ferz moves one cell diagonally. The Zurafa first moves one cell diagonally, then moves like a Rook. The game is won with the checkmate of the opposing King.

There is no mention of Pawn promotion in any of the versions of Cubic Chess. Since Parton does refer to promotion in any other 3D games, it can be taken that Pawn promotion is not allowed in Cubic Chess.

Sphinx Chess

Parton introduced an original playing field, which he termed "four dimensional." It consists of nine 4x4 grids arranged in a 3x3 pattern.

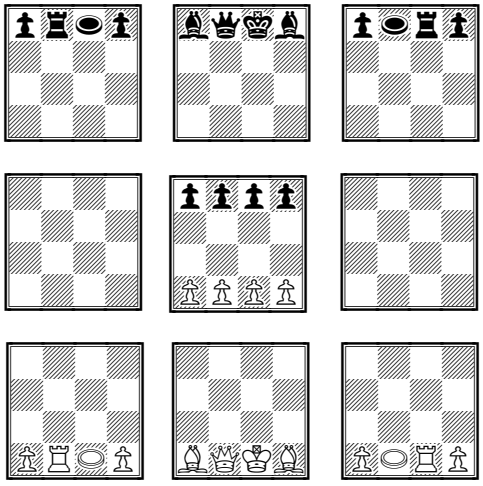
Parton gave the following notation system for the cells:

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Numbering of squares

A	B	C
D	E	F
G	H	I

Lettering of boards



Starting position for Sphinx Chess
= Centaura
(The initial position of White's King, for example, is H15.)

In Sphinx Chess pieces move not only within each 4x4 board, but also across the entire 3x3 array. The Rook slides orthogonally within each 4x4 board or slides orthogonally across the 3x3 array through the corresponding cells within the other boards. Needless to say, for the Rook to slide from Board A to Board C, the corresponding cell in Board B must be vacant.

The Bishop slides diagonally within each 4x4 board or slides diagonally across the 3x3 array through the corresponding cells within the other boards. One quickly realizes that with the initial positions of the Bishops, these pieces will only move within Boards B, D, F and H. Parton suggested that the players could utilize four Bishop but gave no instruction to their initial positions.

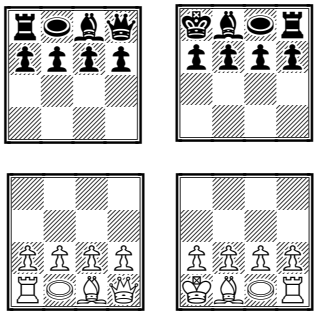
The Queen combines the powers of both the Rook and Bishop. The King steps one cell similarly.

The Pawn has its classic non-capturing forward orthogonal step within each 4x4 area, along with the forward diagonal capture step. Similarly, the Pawn moves across the 3x3 array. It steps without capturing to the corresponding cell of the forward orthogonal board, and captures into the corresponding cell of a forward diagonal board. White promotes upon reaching the farthest ranks of Board A, B or C; Black promotes upon reaching the farthest ranks of Board G, H or I.

The Centaura is a unique 3D piece, as it leaps like the classic Knight within the 4x4 boards but moves as the Queen across the 3x3 array.

There are two possible win scenarios, checkmate of the opponent's King or perpetual check of the opponent's King.

Parton suggested a reduced form of Sphinx Chess, consisting of four 4x4 boards arranged in a 2x2 array.

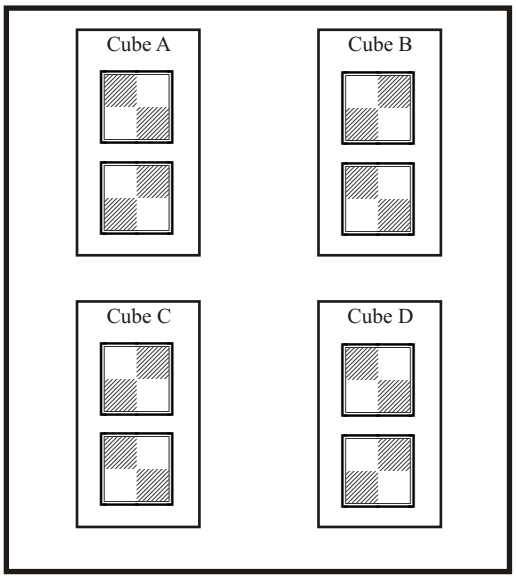


Starting position for Reduced Sphinx Chess

Parton suggested that Sphinx Chess could be played with compulsory captures. With compulsory captures, one could also play Losing Sphinx Chess, forcing the opponent to take all of one's pieces, treating the King as any other piece.

Ecila Chess

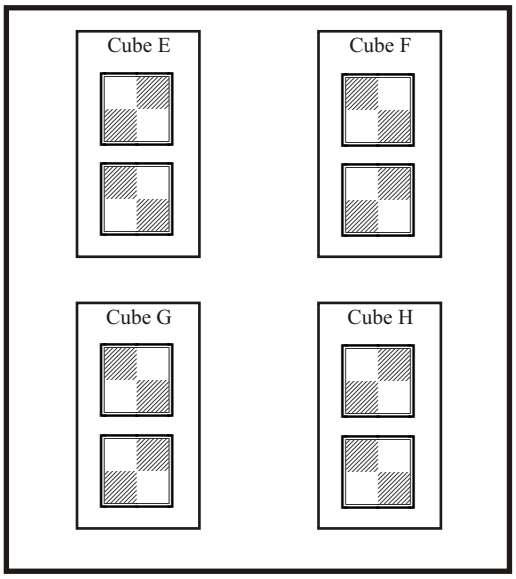
The playing field for Ecila (*Alice* spelt backwards) is also unique. It is a logical development from Sphinx Chess. It consists of cubic boards arranged into cubic arrays. The simplest of these is eight 2x2x2 cubic boards formed into a 2x2x2 cubic array. Parton referred to this type of playing field as "six dimensional."



1	2
3	4

5	6
7	8

Numbering of individual cells.



Board for Ecila Chess

Parton suggested that the Ecila playing field could consist of several other patterns: 2x2x2 cubes in a 3x3x3 array, 3x3x3 cubes in a 3x3x3 array, etc. He often used the simplest array for the purpose of demonstrating the game.

The standard eight Pawns are replaced by a maximum of four Unicorns. The Unicorn moves either triagonally within each cube or to the corresponding cell of a cube located triagonally in the array.

The Rook moves orthogonally within each cube or to a corresponding cell in a cube located orthogonally away in the array. The Bishop moves diagonally within a cube or to a corresponding cell in a cube located diagonally away in the array.

The Queen can move either as both the Rook and Bishop, or as the Rook, Bishop and Unicorn, depending on the players' choice. The King steps as either the Rook or Bishop, never having the Unicorn step.

Parton introduced a new 3D piece, which he called the Narwhal. This piece moves as either the Rook or Unicorn.

The Knight performs its leap by first moving to an identical cell of an orthogonally adjacent cube, then stepping to a diagonal cell within that cube. So that a Knight located on cell A1 could leap to cell B4, B6, B7, C4, C6, C7, E4, E6 or E7.

The Hippogriff performs its leap by first moving to a corresponding cell of an orthogonally adjacent cube, then stepping to a triagonal cell within that cube. Located on A1, the Hippogriff could leap to cell B8, C8 or E8.

Another of Parton's unique 3D pieces was the Wyvern. It performs a leap by first moving to a corresponding cell of a diagonally adjacent cube then stepping to a triagonal cell within that cube. A Wyvern located on A1 would be able to leap to cell D8, F8 or G8.

Parton did not specify the mix of pieces in each player's army, aside from the fact that there should be at most four Unicorns. We may assume that the players should choose equal armies on the basis of mutual agreement. There is no initial starting position for the pieces. Beginning with the King, each player in turn places his pieces upon the field, without checking the opponent's King. After the placement of all pieces, play commences, with checkmate of the opponent's King as the goal.

With the compulsory capture form of the game, the King is treated like the other pieces, both in placement and capture. The goal is the capture of the entire opposing force. There is also an inverse form of this game, where the player, by forcing an opponent to capture his entire force, wins by losing.

Final Thoughts on V.R. Parton

Parton made some great contributions to the field of chess variants, while significantly developing 3D Chess. With the development of both Sphinx Chess and Ecila Chess, he moved 3D Chess on from the concept of the simple cubic playing field.

He also introduced many new ideas for 3D pieces. The Centaura, Narwhal, Hippogriff, and Wyvern have each extended the game uniquely. With the Tamerlane variation of Cubic Chess Parton applied many of the classic pieces to 3D Chess and opened that door for future 3D Chess developments.

There have been, and will be, many developers of 3D Chess but, according to this author's opinion, they will be hard pressed to match the creativity of Vernon Rylands Parton. ■

Sources

Chessical Cubism or Chess in Space, V. R. Parton
The Chess Variant Pages, http://www.chessvariants.com
3D Chess Group at Yahoo!, http://groups.yahoo.com/3_d_chess
3D Chess Federation, http://www.3dchessfederation.com

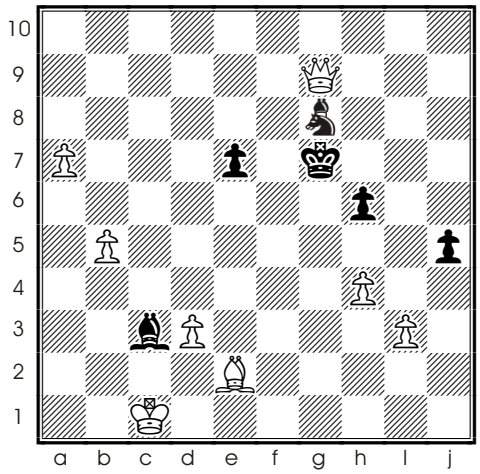
Special Thanks to Dan Troyka, who tracked down much of this information.

"There is no remorse like the remorse of chess." – H.G.Wells

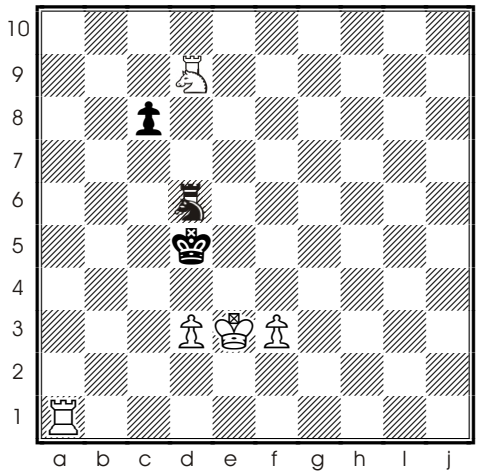
The Grand Chess Corner

by Tony Gardner

Here is the final set in the Grand Chess Problem Solving Contest. These are two more excellent compositions by L. Lynn Smith. The winners, and problem solutions, will be announced next issue.



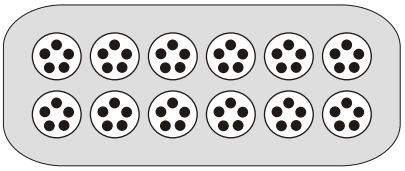
Problem 11 – White to play and mate in 5



Problem 12 – White to play and mate in 8

This is also the final installment of the column under my authorship. The Editor is working diligently to find my replacement. I hope the readers have enjoyed the material. ■

Many thanks to Tony for his stewardship of our Grand Chess coverage for over two years. This column will be taken over in the next issue by John Vehre, current World Champion of Grand Chess. – Ed.



Vai lung thlân

A Game of Considerable Skill

by Ralf Gering

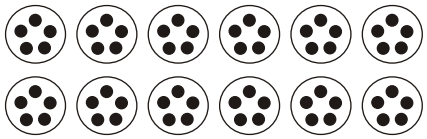
Vai lung thlân was first described in 1912, by Lt.-Colonel J. Shakespear in his book *The Lushei Kuki Clans* (Shakespear 1912). The rules are also given in Larry Russ' collection of mancala games (Russ 2000). The game is played, according to Shakespear, by both sexes of the Mizo people (formerly called the Lushai), who live in the Indian State of Mizoram. This state is located between the borders of Bangladesh and Myanmar in the far east of India. Mizoram was annexed in the early 1890's by the British and after Indian independence was part of the State of Assam. In 1972 it became a Union Territory and eventually, after the signing of the historic memorandum of settlement between the Government of India and the Mizo National Front in 1986, it was granted statehood on 20 February, 1987.

This special cultural background may explain why Vai lung thlân is, unlike most Indian mancala variants, not a multiple lap game. The game bears resemblance to Oware, the National Game of Ghana, and Toguz Xorgol from Kyrgyzstan, two other excellent single-lap variants. While the material culture of the Mizo is colorful and rich, Vai lung thlân "boards" are just two rows of shallow holes dug out of the earth. This and the rather simple rules should not obscure the fact that the game itself is quite challenging.

"Counting the stones in the holes before removing them is not allowed, and considerable skill is required to judge accurately the number of stones, so as to select a hole containing the number of stones which when distributed will leave the maximum number of holes with single stones in them." – Shakespear

Rules

The board consists of two rows of six holes. Each hole contains five little stones at the start of the game.



Vai lung thlân starting position

At his turn, a player lifts up all the stones of one of his holes and distributes them *clockwise*, one by one, into the consecutive holes, first along his row and then back along that of his opponent. If the last stone is dropped into an empty hole on either side of the board, the player captures it as well as all stones that precede this hole (that is, against the direction of movement, or anticlockwise) in an unbroken chain of single stones. Captured stones are removed and placed aside by the player. No matter whether it resulted in a capture or not, a move is over after one lap.

The players move alternately, and passing is prohibited, unless a player has no legal move. The game is finished when no stones are left on the board. The player who captures more stones wins. If each player captures 30 stones, the game is a draw.

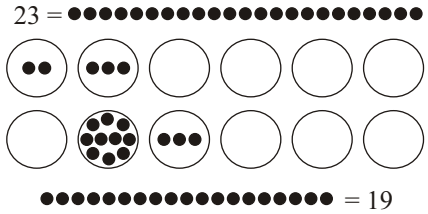
Suggestions for Good Play

The game starts slow, but accelerates as stones are captured or accumulated in a few holes and the board clears. The middle game should be a clever exchange of stones, captured one by one.

A hole containing 12 stones can always capture at least one stone because the last stone is dropped into the emptied hole. On the other hand, it is impossible for holes that contain more than 12 stones to capture. These holes can be used for defense because by distributing their content all empty holes of the board are filled. At the end of the game players try to deprive their opponent of legal moves while keeping as many stones as possible on their own side in such a manner that only single stones are created when they are distributed. Therefore, overloaded holes become "bad shape." On the average a game lasts about 70 moves (or 35 per player).

There is no "official" notation system. For the purpose of this article each play numbers his holes from 1 to 6 from his right to left.

Endgame Problem



South to move and draw! What is the best response for *North*? (See p. 29 for the solution.) ■

Sources

Russ L. *The Complete Mancala Games Book: How to Play the World's Oldest Board Games*. Marlowe & Company, New York, 2000.

Shakespear, J. *The Lushei Kuki Clans*. Macmillan and Co., London, 1912.

We mentioned in a previous issue that Awari/Wari/Awélé/Oware has been solved by John W. Romein and Henri E. Bal of the Free University in Amsterdam. With perfect play the game is a draw. There is an applet at http://awari.cs.vu.nl/ that gives the best play for any position. In the notation above (reversed because play is anticlockwise), the best opening move is 6, to which the opponent responds 5. In fact, every other opening move loses against perfect play. It seems that the strategy of building big overlaps does not work after all as it can always be thwarted with perfect play—a surprising result! Now that Wari is solved, do we need an alternative mancala game to play?– Ed.

Unequal Forces Game Design Competition

The winner of the *Unequal Forces Game Design Competition* was determined just before the last issue went to press. One of the judges had yet to submit his nominations, but Unlur was nevertheless the clear winner. Second place was harder to determine, but it finally came down to Praetorian, a game by Kirk Uhlmann, a casino manager from Kansas City. Two games described in previous issues, Reviser and Defiance and Domain, were also in the running. In this issue I will first describe Praetorian and then discuss what we have lined up for the third competition. Firstly, here are a few thoughts from Kirk Uhlmann, inventor of Praetorian, that might, in a way, anticipate the next competition:

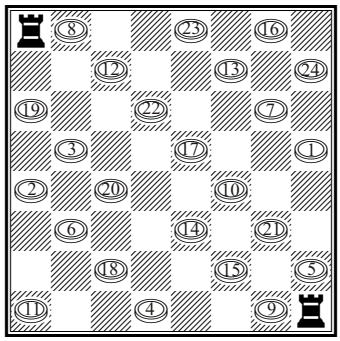
"*I tend not to prefer most abstract games that have complete information, and I think it's more interesting when the opponent's goals (or means to the goal) are not necessarily obvious. I think games should create a tension or atmosphere that go beyond what the opponent's available moves might be. I wanted to create tension in that the Assassin player wouldn't necessarily play a straight optimal strategy based upon the layout of the board, as being too obvious might compromise the chance of victory by revealing too much information. On the other hand, the Praetorian player cannot anticipate the 'correct' optimal moves of the opponent, because he can never be sure just what position the opponent is in, or how close he is to victory or defeat, and must plan accordingly. I wanted to create a game that is fun, creates surprises for both players, makes players balance an optimal strategy against uncertain information, and rewards superior tactics. I wanted the Assassin player to be undergoing constant worry about 'being caught,' while the Praetorian player feels constant pressure to find the Assassin before the Assassin strikes.*"

Praetorian

Praetorian is a game for two players, played on an 8x8 board. Two pieces are needed to represent praetorian guards (or police), for example two black Chess rooks. Also, 24 numbered pieces are needed to represent civilians; Bingo markers, for example, or checkers with numbers pasted on them, will do.

One player is the Praetorian, the other is the Assassin. The Assassin player secretly writes down the number of the *assassin* and the numbers of two *targets*. The two praetorian pieces are placed in opposite corners of the board. The Praetorian player then shuffles the civilian pieces and places all 24 on the board such that each row of the board has three civilian pieces, and no two civilians are adjacent either horizontally or vertically.

The Assassin moves first, and the players alternate moving. On his turn the Assassin may move any civilian piece, including the assassin or targets. The civilians may be moved one square in any direction, orthogonally or diagonally to an unoccupied square (i.e., like a Chess king). On his turn the Praetorian may move *any* one piece, praetorian or civilian. The civilians, as always, move one square in any direction to a vacant square. The praetorians, on the other hand, may move any number of vacant squares in a straight line, either orthogonally or diagonally, like a Chess queen. Neither player may move a civilian piece that was just moved by the opponent.



Possible Praetorian starting position

If the assassin piece is adjacent to one of the targets, orthogonally or diagonally, the Assassin player may choose to eliminate the target instead of making a regular move. The target is simply removed from the board to take no further part in play. The Assassin player need not reveal the identity of the assassin if there is more than one civilian next to the target removed. The Assassin player wins by eliminating both targets.

On his turn the Praetorian player may decide to question civilians instead of moving a piece. In this case, the Praetorian player specifies which civilian piece adjacent to each praetorian, orthogonally or diagonally, is to be questioned. The Assassin player must reveal whether or not one of the two civilians questioned is the assassin. The Praetorian player wins if one of the civilians questioned is the assassin.

Variants

Optional rules may be used to make the Praetorian player's job easier or harder:

1. The Praetorian player may choose only one of the two praetorian pieces to question a civilian on a turn. (Harder)
2. The Praetorian player may question civilians *and* move on each turn. (Easier)
3. More than one civilian may be questioned by each praetorian on a turn. (Easier)
4. There is only one target that the Assassin player must eliminate to win. (Harder)

Strategy

The Assassin will move civilian pieces in an attempt to block or slow down their access to the praetorians, while at the same time moving the assassin closer to the targets (or moving the targets closer to the assassin!). The Assassin must not be too obvious lest the identity of

the assassin and targets be tipped off. The Assassin should have both targets nearby before striking either one.

The Praetorian player must attempt to question as many suspects as quickly as possible and be aware of imminent threats in areas where pieces have been moved and where the killer might be. The Praetorian player may be able to make good guesses based on the moves of the Assassin player, but should be aware that such moves may be deceiving.

The 2003 Game Design Competition

In *AG10* I mentioned that almost all abstract games can be regarded as games of unequal forces because the starting position for the second player must of necessity be different from the starting position of the first player. Even Chess, for example, is a game of unequal forces in this sense, which is borne out by statistics that give White a slightly higher percentage of wins than Black. In many other games the advantage of the first move is far more pronounced, and measures have to be taken to even the chances of both players. The "pie rule" is the usual method with connection games; Go uses *komi*, additional points awarded to the second player; alignment games such as Renju and Pente place restrictions on the first player. Of course, none of these games has an imbalance deliberately built into it, unlike the games of the *Unequal Forces Game Design Competition*.

It started me thinking about games that do have perfectly equal forces in this extreme sense. Games in which both players share the same pieces, such as Trax, may be candidates, but again the first and second players will have different starting positions. This may be enough to give one player or the other an advantage.

The only games that I could think of in which both players have precisely equal chances are games with *simultaneous movement*. What this probably means in practical terms is that the players have to record their next moves secretly, then both players reveal their "orders" and make their moves simultaneously. There has to be some mechanism for resolving disputes if the moves of the players clash. This system is the norm for most wargames and is used in some popular games too, such as Diplomacy. Robo Battle Pigs from the *8x8 Game Design Competition* is a game of simultaneous movement. Chess could be made into a game of simultaneous movement with rules to resolve situations in which two pieces are moved to the same square. Of course, this introduces an element of guesswork and chance, and so perhaps the better player will not win every time. But we can still say that the winning chances of the two players are *statistically equal*.

We decided that the next competition is the *Simultaneous Movement Game Design Competition*. I expect many games will utilize the writing-orders-resolving-disputes mechanism described above, but perhaps there are other ways of guaranteeing simultaneous movement. Perhaps also it is possible to get away from the wargame model and devise a connection game, say, or an alignment game with simultaneous movement. If the first two competitions are anything to go by, the results will be very surprising. It's going to be a lot of fun! The competition rules are given after the following article on Unlur.

Unlur was a worthy winner of the *Unequal Forces Game Design Competition*. Its different objectives for the two players, the unique extension of the pie rule, and the consequence that some of one's stones may even turn out to be a liability make Unlur quite unlike other Hex-like connection games. It has attracted more interest than any of the other games from the two years of competitions so far. The rules given in *AG11* have been slightly modified and, as you will see, connection game experts are starting to give it serious attention. ■

UNLUR

Winner of the Unequal Forces Game Design Competition

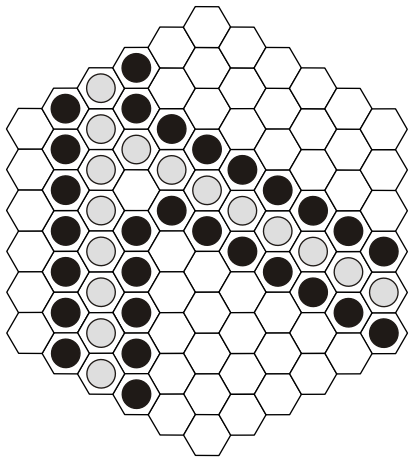
by Jorge Gomez Arrausi, Carl Johan Ragnarsson
and Taral Guldahl Seierstad

Connection games have always attracted me. I liked the simplicity and the mathematical perfection of Hex. Later, I rediscovered the Game of Y without knowing that it had been invented already. Since that time, I became convinced that a connection game on a hexagonal board should exist. Of course, Christian Freeling invented Havannah, which has very simple rules, but it has not got the mathematical perfection I desired.

On 26th December, 2001, only five days before the deadline of the *Unequal Forces Game Design Competition*, I was playing a game of Lur, a territorial game inspired by Anchor and Hexgo. Suddenly I became aware of a property of hexagonal boards with hexagonal cells: If the board is completely filled with pieces of two colors, one player must have created a line or a Y. (This property has now been mathematically proved by Taral Guldahl Seierstad.) This would give me the mathematical perfection, and I just needed some simple rules.

Initially I tried the rule that the first player who creates a line or a Y wins the game. Unfortunately, this does not produce a balanced game. An attacking player has too strong an advantage since he has five different ways to win—three lines and two Y's.

Suddenly I remembered the *Unequal Forces Game Design Competition*, and that Kerry had suggested a connection game with different objectives. There it was! One player attempts to win by creating a line, and the other by creating a Y. However something remained, as creating lines is easier than creating Y's, and the first move advantage was not enough to balance the game. On the other hand, draws are possible, as we can see in the diagram below.



White cannot achieve a line; Black cannot achieve a Y

The first problem was solved by adopting the rule that I call the *contract*. At the beginning of the game both players place black pieces on the board, until one considers that Black has a better position and decides to play Black.

The other problem was how to avoid draws. A game cannot be a good game if it is often drawn, and when one first invents a game one does not know how drawish it is going to be. I decided to eliminate possibility of draws. I realized that the only way for a draw to happen is when one player creates the opponent's

objective, so I decided that if a player creates the opponent's objective he loses. This was a lucky choice. I later realized that this rule makes the game very different strategically from Hex, and it affords scope for new tactics. It also allows for new concepts, such as "topologically won positions," that we will discuss below.

After Unlur won the competition, Juan Zubieta decided to include it on the Ludoteka website so that it could be played in real time. We subsequently were able to test the game deeply.

The first thing we observed is that Unlur over a board with eight cells per side becomes very complex and difficult to understand, so now we prefer to play on a board with six cells per side. We do not really know what is the best size yet, but this article will be based on the smaller board.

The other refinement of the rules is related to the contract. I have adopted the rule that forbids play on the border cells of the board during the contract stage. Why? We have discovered that some Black moves on the border of the board are a liability for Black. So, if during the contract one player felt that playing inside the border would lead to a good position for Black, he would make a weak move by playing on a border cell, thereby extending the contract. This situation could be repeated several times, with the contract continuing indefinitely.

Some preliminary discussions of the tactics and strategy of this unusual game follow these rule clarifications.

– Jorge Gomez Arrausi

Other Winning Conditions

In addition to the normal winning conditions, there are a few other configurations that guarantee a win for one of the players. In other words, when the game reaches such a position, one of the players cannot help but win, even if the players collaborate not to let that happen. I know of three such winning configurations.

I will say that a player *controls a side*, when he has a chain of stones connecting the two sides adjacent to this side. For example, White controls the right if there is a white chain connecting the top-right side to the bottom-right side.

The three winning configurations are:

1. If White controls two opposite sides, then White wins.
2. If Black controls three non-adjacent sides, then Black wins.
3. If White and Black control one side each opposite to each other, and the two controlling groups are adjacent to each other, then White wins.

In most cases it is probably easier to win by using the ordinary winning method (create a line or a Y), but I think these other methods can have an impact on the game in a given situation. In fact I have seen each of them used in games I have played or in variations thereof.

– Taral Guldahl Seierstad

Tactics and strategy

As a hexagonal connection game, Unlur inherits much of the theory about edge templates from Hex. For the basics about templates we therefore refer readers to Cameron Browne's articles on Hex in earlier issues. There are, however, certain important cases where Unlur differs from Hex. One of the most notable ones is that a 0-connected path does not guarantee a win. If Black has a 0-connected path creating a Y, it may be possible for White to force Black to give up a secure connection in order to avoid creating a line. (See Diagram 1.) For White, a 0-connected path only rarely does not imply a win, since it is very hard for Black to force White to make a Y before he makes a line.

To avoid this, Black should try to make a 0-connected path that does not touch sides that he does not plan to use in his final Y. White, on the other hand, should try to force Black to touch such sides; typically, it means that White should force the black stones to touch sides belonging to both sets of three sides that make up a Y. Clearly corners are dangerous for Black, since they belong to two adjacent sides. If a black stone is securely connected to an edge by an edge template that covers a corner, it means that White can force the connection to go to the corner. (See Diagram 2.)

Another important difference between Unlur and Hex is that in Unlur all sides are friendly. This means that we have another family of edge-templates, namely those that guarantee that a stone can be connected to at least one out of two different sides, or to two different sides independently. (See Diagram 3.) There are too many possibilities for a useful catalogue.

A final unique difference is that there is a set of positions that topologically guarantees a win for one player, before the game is completed. This is completely unlike most other connection games, where a player can usually complete his goal if the opponent has not already achieved his. (See Diagram 4.)

The Unlur Contract

In Unlur, an ingenious variant of the pie rule is used. The players have different objectives, and it is quite clear from the rules that White has a distinct advantage on an empty board. So, the players even out the game by alternately placing black stones on the board. We will refer to the positioning of black stones when a player passes as the *contract*. Thus the goal for the players in the opening should be to create an even contract. Because the opening generally consists of several moves, it is possible to make the game very evenly balanced. Also, even on the smaller Unlur board with six hexagons on each side, there are 11 opening moves, and around 50 possibilities for each move thereafter. So, for a four-stone opening, there are already 2 million possibilities. The number of openings that are actually played may be smaller, since players may repeat certain patterns, but in general this makes opening analysis very difficult. We will look at two types of contract.

The block contract

When the position gets so close that both players may consider swapping, you do not want your next black play to have too large an effect on the position. The moves that are least influential to the position are usually those that are adjacent to one, two or three stones already placed. Thus, when the initial plays are near the sides, it is quite reasonable to expect a contract with one or two blocks of stones grouped together. Playing like this makes sense for both players because it will never force them to play a move that will greatly affect the position.

A contract of this type can thus be played close to one or two (often opposite) sides, effectively leaving only two possibilities for White to make his line. (See Diagram 5.)

In this type of contract, it is usually reasonable to expect that White will play the first move of the game on the center point, so this is what the potential Black player has to defend against.

The center contract

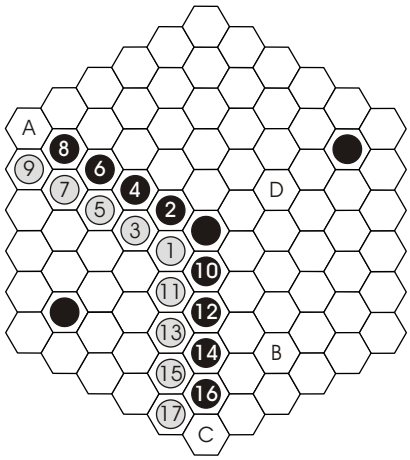
The first or second move for Black is played in the center. Because the center point lies on diagonals linking up all the sides, it is a very powerful point. So, a typical contract can be expected to last for only two or three moves. Similarly, if the first moves are near the center, again the contract can be expected to be short, perhaps three or four moves. (See Diagram 1.)

Generally, looking at reasonable center and side openings, we can interpolate and get an impression of what is fair and what is

not. This gives a good idea of how long a contract should be, but the particulars are more difficult, because of the specific relations between stones. Generally, fewer stones are needed if they are spread out, and fewer stones are needed if they are close to the center. As for tactics, you should always expect White to start on the center point if it is not already occupied. Also, you should be ready to answer an attachment by White on a point adjacent to the center point if you take Black with a stone at the center point.

Also, the number of possible openings is quite astonishing. Only three randomly distributed stones allows for around 200,000 possible openings. However, it is only near the center that three stones is sufficient, so the total number of reasonable contracts is likely to be much larger.

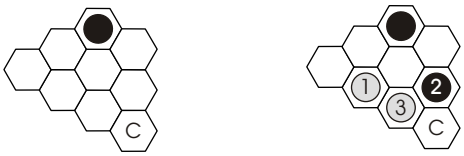
Diagram 1 – The "arrow" opening



T*he diagram shows the "obvious continuation" from the opening with the unmarked black stones. It is a natural choice for both Black and White from a center-point opening. If Black's only goal were to connect three alternating sides, he could simply play A, creating a 0-connected path between the left, top-right, and bottom-right sides. However, as noted above, a 0-connected path cannot guarantee a win. Black would not be allowed to connect to the bottom-right side until he has connected the top-right side, because A is also on the top-left side. In this particular case, it appears hopeless for Black, since White in effect gets five free moves at the bottom while Black connects to the top right.*

The continuation from the diagram would be Black A, then White B!. White C may also work here, but in general B is a good example of Unlur technique. If Black has more material on the right side, a move such as D could be an effective replacement for Black A.

Diagram 2

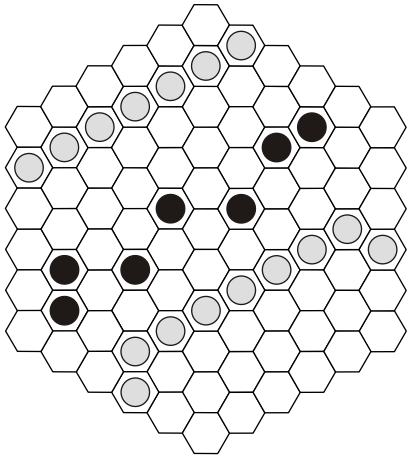


The connection template above left guarantees a connection to the bottom-left side. In Hex, this would always be sufficient information, but in Unlur it also makes a difference that there is a corner in the template at C. After the sequence 1-2-3, shown on the right, Black needs to play in the corner to complete the template. As seen in Diagram 1, this may be a liability for Black.

Diagram 3

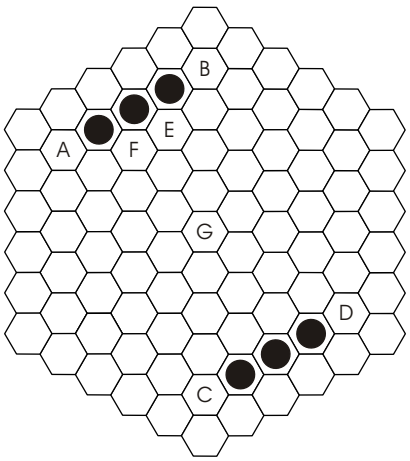
In the template on the left, White is guaranteed to connect to either the bottom-left or bottom-right side. In the template on the right (including A, B, and C), White is guaranteed to connect to both the bottom-left and bottom-right sides. Without one of the points A, B, and C, the connection templates to the two sides are overlapping, thus White is not guaranteed to connect to both. (Black plays at D, with a follow-up at either E or F.)

Diagram 4



The above configuration of white stones guarantees a win for White, no matter where the Black stones are placed. Notice first that Black can never form a Y, since a white group separates the top-left side from the right side and the bottom-left side, and another white group separates the bottom-right side from the left side and top-right side. Furthermore, White can never be forced to form a Y before he forms a line, since whenever the two white groups are connected he also achieves his winning condition. So, the game will end either with White forming a line, and winning, or Black forming a line in the center area, which is also a win for White.

Diagram 5 – A fair contract?

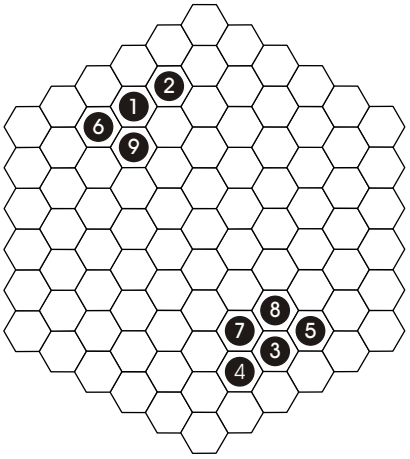


If Black gets all the stones at A, B, C, and D, he has almost eliminated the possibility of a White top-left to bottom-right win, so, in effect, his goal reduced to connecting his two large groups. Surely, this goal seems much easier than White's goal. However, with only the black stones as played so far, it is hard for Black after White G. The answer is probably that Black needs one or two of the points marked A-F, in addition to the six stones on the board.

– Carl Johan Ragnarsson and Taral Guldahl Seierstad

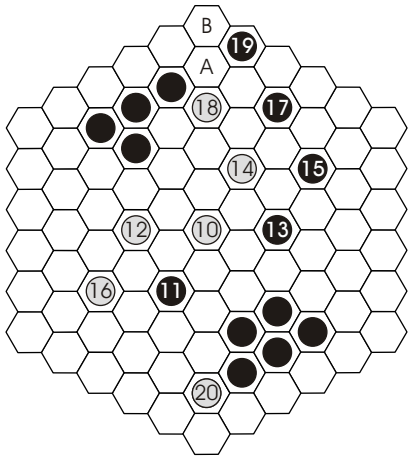
Sample Game

The following game was played online between Elvire Scheibling and Carl Johan Ragnarsson. Carl Johan passed on the 10th move, taking Black.



The contract

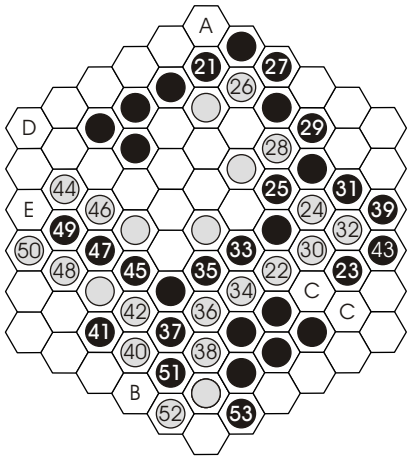
Considering the general ideas about a "block" contract discussed above, the contract looks favorable for Black. However, any opening where Black has no stones near the center point will be difficult to analyze. On a small board, the 7, 8, and 9 stones have nice potential toward the center.



Position up to White 20

The beginning of the game has nothing special. All the moves here are quite natural. Even more than in Hex, it is important, especially for White, to be connected in the center, to avoid Black breaking through here. The center is the focal point of the game, and there is not as much room for keeping your options open.

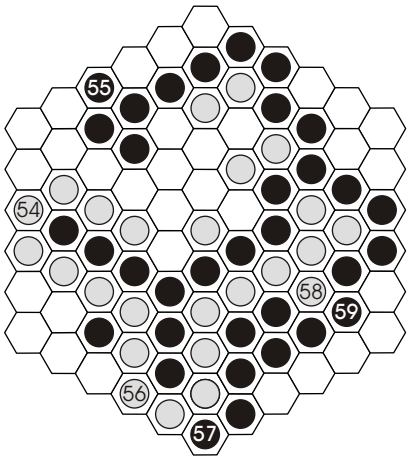
In this type of game Black has to rely on sneaking around on the sides, trying his best to avoid the corners. White was already thinking that she was in a bad position, giving Black control of so many sides. She thought it was now urgent to take control of the lower side. So White made the unexpected move 20. Maybe it is a mistake and she should have pushed Black to the corner, playing first the A-B exchange. However, the situation is not easy since Black is not forced to answer at B immediately. In any case, Black was happy to avoid the corner and played A himself.



Position after Black 53

Here, White is happy she did not force Black in the corner A in the beginning of the game. With a Black stone at A, Black could play B and win, achieving both the Black and White aims in a move.

But, Black can win anyway! Even though Black needs an extra tempo to play at one of the points marked C, Black has enough time to connect to the left, by playing at D or E. But, if Black had only one more disconnected bridge on the right side, White could have sneaked by on the bottom left with both moves E and B. This shows clearly how important the forcing moves can be for the end result of the game, not only because of their placement, but also because of the sides a player connects to, and the tempos it takes him to connect.



Final position

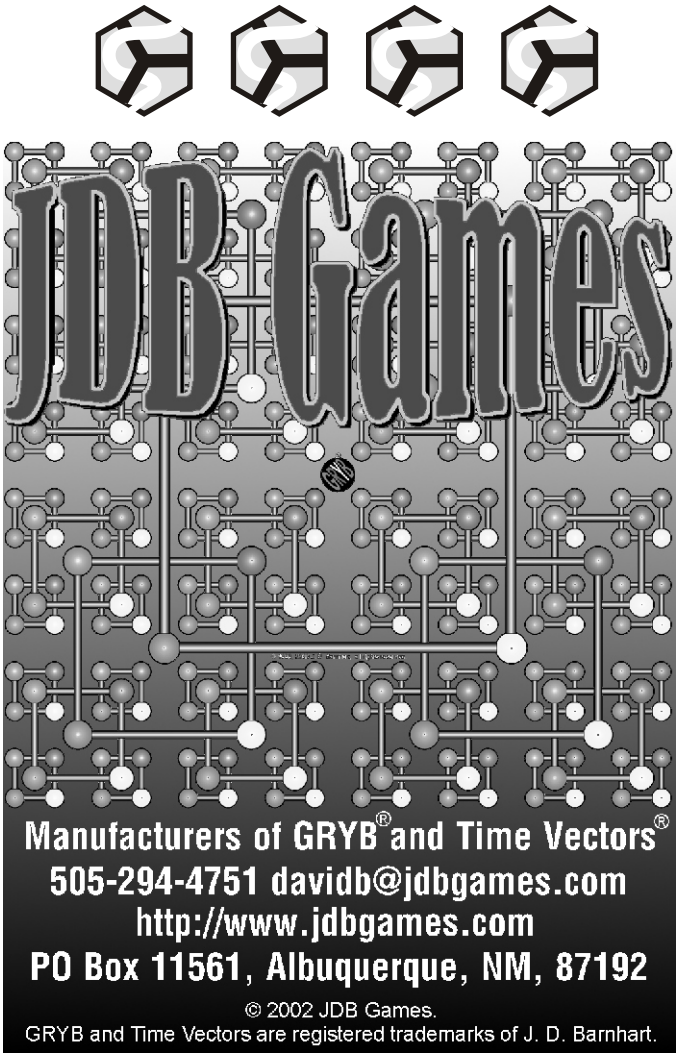
Black wins, achieving the aims of both Black and White.

– Carl Johan Ragnarsson

Jorge is 24 year old and lives in the Basque Region of Spain. He is studying mathematics. He was a LOA enthusiast until the computer program Mona became the champion. Nowadays, he says he does not concentrate on any game, although he is often to be found at Ludoteka, playing games like LOA, Wari, Hex, and of course Unlur. He also likes playing by e-mail on Richard's PBeM Server. Although Jorge has invented a few games, all of them abstract games, he has the feeling that all of his games are variants. Nevertheless, he still thinks that something completely new could still be invented.

Taral is 23, from Lillehammer, Norway, and is just completing his Master's degree in mathematics. He is a player of connection games, including Twixt and Onyx. Carl Johan, from Sweden, is also a mathematician, just 20 years old, and already working on his PhD. He is a Trax expert, and even challenged Donald Bailey for the world title last year. He plays other connection games as well as Go and Go variants.

There is now a mailing list for discussion of Unlur at http://groups.yahoo.com/group/unlur, and one may play online at the Ludoteka website at http://www.ludoteka.com/. Jorge has a webpage for Unlur at http://www.abstractboardgames.com/unlur, and he hopes to be running the first Unlur tournament by the beginning of 2003. If you wish to get some practice in the meantime, an Unlur board is given on the back cover of this magazine. It is the right size to play with small coins such as pennies and dimes, but I expect that most game players would be able to find other suitable counters. –Ed.



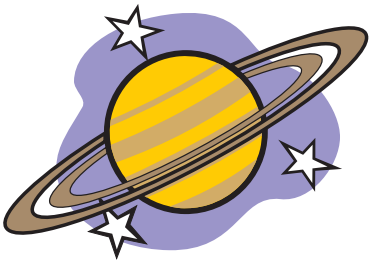
2003 Game Design Competition: Simultaneous Movement

Abstract Games magazine, together with About Board Games, and the Strategy Gaming Society, is sponsoring the Third Annual Game Design competition, this year with the theme of Simultaneous Movement. The goal is simple: design a great two-player game with simultaneous movement using pieces most people are likely to have around the house. Prizes will be awarded to the top two games, as chosen by a panel of judges from around the world. First prize is a trophy, a one-year membership in the Strategy Gaming Society, and a one-year subscription to *Abstract Games*. The top two finishers will be submitted to a variety of game publishing companies for their consideration. In addition, the top two games will be published on About Board Games, in *The Strategist* (the Strategy Gaming Society newsletter) and in *Abstract Games*. Additional entries may also be published in the same outlets. About Board Games, *The Strategist* and *Abstract Games* retain non-exclusive rights to publish any entry in the contest.

Official Rules

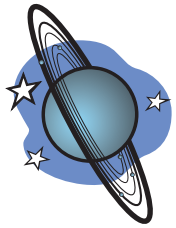
1. Games must be designed for play on an easy-to-replicate game board, using checkers, Go stones, Chess pieces, Poker chips, dice, or other items likely to be found in the average gamer's collection. (Examples of easy-to-replicate boards include any board that is based on squares, equilateral triangles or regular hexagons.)
2. Games must be designed for two players. Additional players are allowed, but cannot be mandatory.
3. Games must include simultaneous movement. That is, there must be some mechanism for both players to move at once rather than the players alternating in turns to move. Inventors should strive for originality rather than simply applying simultaneous movement to established games. Games requiring manual dexterity or speed will not be considered.
4. Entries will be judged by a panel selected by About Board Games, the Strategy Gaming Society and *Abstract Games*.
5. Winners will be determined using the same system employed by the Strategy Gaming Society to determine the winners of the Gamers Choice Awards. For more information visit this page: http://boardgames.about.com/library/bl-process.htm.
6. Games rules must be no longer than 1000 words plus necessary diagrams.
7. Any games submitted to previous game design competitions sponsored by *Abstract Games* and About Board Games are ineligible and may not be resubmitted.
8. Entries must be received by e-mail (plain text, please—no attachments will be opened) at boardgames.guide@about.com no later than December 31, 2002, at noon Eastern US time. Any entries received after that time, regardless of reason, will not be considered. Entries should include the designer's name, e-mail address, and postal address. A maximum of two games per designer will be permitted. If illustrations are required to explain the rules, please post the illustrations to a website and include the URL with your entry. If you do not have access to a computer but would like to enter, please mail your entry to About Board Games, PO Box 63, Cornwall, PA 17016-0063, USA.

If you have any questions, please e-mail them to boardgames.guide@about.com.



Orbit

A new game of territory



by Steven Meyers

The question of how Go might be improved is an interesting one. What are the game's perceived flaws, and how can they be corrected? In the course of exploring this question I designed Orbit, a family of 29 related games. Of these I have found three to be quite enjoyable. They were described in *Games* magazine (November 2001), but this article will go into more detail about the standard version.

One problem with Go, from my point of view, is the contradiction of *ko* (although some people would argue that *ko* is actually a boon because of the interesting tactical possibilities it offers). Another issue is that Go does not extend indefinitely—that is, as the board size increases beyond 35x35 or so, the game begins to degenerate into isolated pockets of life-and-death. Although these two issues are not present in Orbit, I do not claim that Orbit is better than Go. While elegance has some mathematical basis, the question of "better" is not demonstrable and is decided by individual gamers.

The *Games* article did not specify which of the three was the standard version. I have since decided to make Half-Prohibition Orbit standard, despite the fact that the opening is a bit slow. The middle game can produce some intricate and unusual positions, and it can be decisive—generally one player will succeed in forming and protecting a giant half-orbit, effectively winning the game. This "sudden death" aspect makes it feel perhaps more like a connection game than a territorial game. Every now and then an endgame is necessary and can be rather tricky due to the concept of *shared territory*.

Rules

The essential rules of Orbit can be summed up as, "Half-orbits prohibit, orbits capture and prohibit." Here is the full story:

1. Orbit is a game for two people. It is played on a 16x16 (counting the points, not the squares) orthogonal board, using a sufficient number of black and white playing pieces.
2. The board begins empty. Black goes first. White then decides whether or not to swap the move and play as Black (the "pie rule").
3. The turn alternates between the two players, each placing a stone of his color on an empty intersection (subject to certain restrictions). It is permissible to pass your turn.
4. For the purpose of defining the structures used in the game, two pieces are considered to be *connected* if they are orthogonally or diagonally adjacent. A *connected group* is a collection of stones of the same color such that any stone in the group can be reached from any other through a series of connected pairs of stones in the group.
5. A *half-orbit* is a connected group which, together with one side of the board, completely encircles one or more points. (A corner point is considered to belong to both sides that meet there.) An *orbit* is a connected group completely encircling one or more points of the board.
6. When a half-orbit is formed, no opposing pieces are captured. However, it is thereafter prohibited for the opposing player to play within that formation. When an orbit is formed, any opposing pieces contained within it are captured. Captured pieces are simply returned to their owner and do not count in scoring the game. It is thereafter prohibited for the opposing player to play within that formation.
7. When both players have passed consecutively, the game is over. As in Go, stones that cannot avoid capture are removed from the board at this stage. *Dame* (neutral points) can be quickly filled in by either player.
8. A player's score is simply his territory—in other words, the total number of vacant points contained within the player's orbits or half-orbits. Captured pieces do not count.
8. In Orbit there is the phenomenon of *shared territory*—empty points where neither player is allowed to play. Since neither player controls these points exclusively, they do not count as actual territory and thus add nothing to a player's score.

Note that Orbit can easily be played with pen and paper, despite the fact that pieces are captured. The reason is that captured positions are not subsequently re-occupied—it is illegal for the captured player to do so, and it is a wasted move for the capturing player to do so. Simply mark the captured pieces. Now here are some examples to clarify the rules.

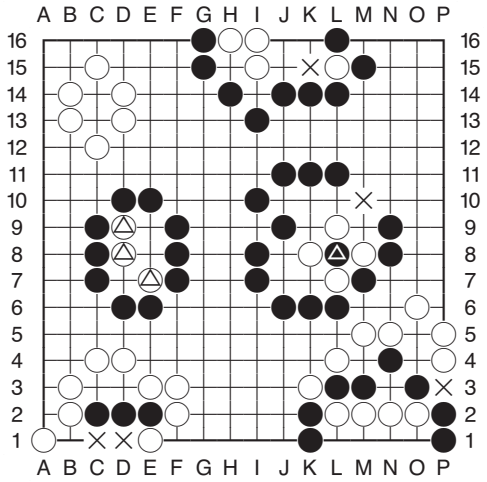


Diagram 1 – Structures and effects

Diagram 1 shows examples of the structures used in Orbit and their effects. In the upper left White has completed an orbit. At the middle left Black has completed an orbit—note that the three white stones are captured. In the lower left White has completed a half-orbit. The three black stones are not captured, but Black cannot play inside the formation; therefore, the black stones are doomed since White cannot be prevented from playing on both the crossed points and forming an orbit. In the upper right Black has completed a half-orbit. The three white stones can never be

captured, but the single white stone is doomed since Black cannot be prevented from playing on the crossed point. At the middle right White has completed a small orbit, capturing one black stone. However, if it is Black's turn, he will play on the crossed point, forming an orbit and capturing the four white stones. In the lower right Black has completed a half-orbit. The four white stones are not captured, but White cannot play within the half-orbit. White may, however, play on the crossed point, completing an orbit and capturing the four middle black stones. Black's half-orbit would now be destroyed.

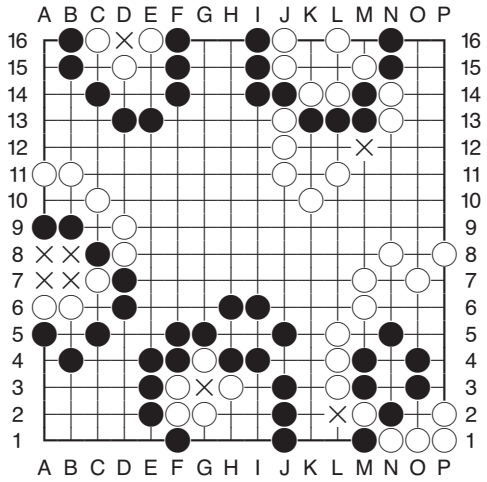


Diagram 2 – Shared Territory

Diagram 2 helps illustrate the principle of shared territory. In the upper left Black has a half-orbit that controls four points of territory. White has a half-orbit controlling no points of territory. The crossed point is shared territory—it is within both players' half-orbits and thus counts for neither player. Note that since Black cannot play there, he cannot capture the middle white stone and destroy White's half-orbit. On the left Black and White both have formed half-orbits. The four crossed points are shared territory, off limits to both players and counting for neither player. White has only three points of actual territory (i.e. places where he can play and Black cannot); Black has only two points of actual territory (at B5 and C6). At the bottom a white orbit exists within a black half-orbit. The crossed point is at the moment shared territory. But Black can claim it for his own (and capture five white stones in the process), since he cannot be prevented from connecting underneath, forming an orbit. If White had a stone at G1, he would be safe, and the crossed point would remain shared. In the upper right Black and White both have a half-orbit. Black has one point of territory (at M16), and White has none. K16, K15, and L15 are shared territory. If it is White's turn, he will play on the crossed point, forming an orbit and capturing the four middle black stones; now he will have 10 points of actual territory. At the bottom right a black orbit exists within a white half-orbit; N4 and N3 are shared territory. If it is Black's turn he will play on the crossed point, capturing the White stone at M2.

Diagram 3 is a puzzle. It is White's turn to play. As far as I can tell there is only one move that guarantees victory. The solution is given on p. 29. ■

"Chess problems demand from the composer the same virtues that characterize all worthwhile art: originality, invention, conciseness, harmony, complexity, and splendid insincerity."
– Vladimir Nabokov, "Poems and Problems," 1969.

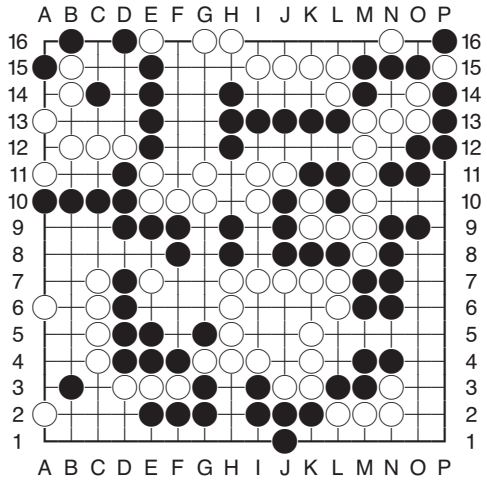


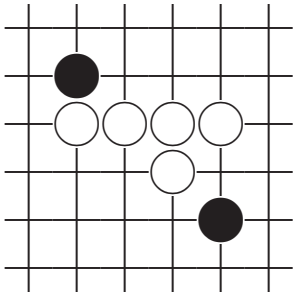
Diagram 3 – Orbit Puzzle: White to play and win

Steven Meyers lives in Cincinnati, Ohio. He is 32 years old and works in the kitchen of a retirement home. Aside from inventing new games, Steve has also been investigating established games. In January 2002 he discovered an interesting property of the game of Y (the uncurved version):

"Suppose you are playing a game *n*, where *n* is the number of points per side. Inside game *n* are three *n-1* games, at least two of which are necessary and sufficient to win in order to win the *n* game. Each *n-1* game, in turn, contains three *n-2* games, at least two of which are necessary and sufficient to win in order to win the *n-1* game. And so on until *n=1*, where each point is treated itself as a 'game."

Steve contacted Ea Ea (one of the co-inventors of Y) about this discovery, who replied that it was very closely related—though not identical—to a discovery he had made over thirty years ago. Steve also passed the information along to Jack van Ryswyck of the University of Alberta, who found a way to use it probabilistically to create a new evaluation function for Hex (which is a special case of Y).

For discussions about Orbit or any other of these matters Steve can be contacted at swmeyers@fuse.net. The website for his games is at http://home.fuse.net/swmeyers/home.htm. – Ed.



A Beautiful Move in Pente®

by Mark Mammel and Gary Barnes

In Pente the ability to capture pairs of stones brings complexity and tension to the game. A beautiful move in Pente is often one that threatens to capture opponent's stones. Not only is threatening a pair sometimes good for defense, it can be a powerful offensive move if the stones threatened are important to the opponent's defense. Because the game can be won by capturing five pairs instead of making a five in a row, defending pairs can be increasingly important as your opponent starts to get near five captures.

If no opening restrictions are followed, Pente can easily be won by the first player to move. A "tournament" rule is followed by serious players as follows: The first player's first move must be to the center intersection; the first player's second move must be at least three intersections away from the first move. This would be on or outside of the square framed by G7, G13, N7, and N13. Even with this opening restriction, experienced players find it difficult to win as Player 2. The game described in this article is from the 2000 World E-mail Pente championship played on Richard's Play-by-E-mail server at http://www.gamerz.net/pbmserv/. Gary managed to find a win as Player 2 to help him win the final round and become the 2000 World E-mail Champion.

Player 1 (White) – Mark Mammel, College Park, MD, USA
Player 2 (Black) – Gary Barnes, Lenexa, KS, USA
Time limit for each side – 90 days for game.
Annotated by Mark and Gary, with comments by Gary in *italics*.

Mammel	Barnes
1.K10	**2.L9**
3.K7	**4.K11**

The Boston Defense. Analysis has shown it to give Player 2 better chances than other openings.

5.H10	**6.J9**

A modern sub-variant of the Boston Defense. Other common moves are 6.M9, 6.L11, and 6.M11. These other moves have been analyzed extensively and are all shown to be better for Player 1.

7.J10	**8.L10**

Threatens a double three at M9.

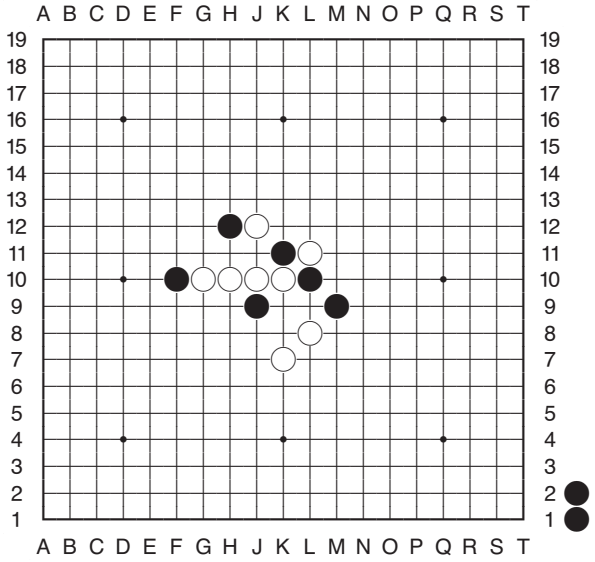
9.G10	**10.F10**
11.L8	

With the extension at G10 White threatens to capture a "keystone" (a stone blocking a four), and ruin Black's threat of a double three.

	12.M9
13.L11*	**14.L10**

Immediately to capture back with 14.M12 would give White a powerful initiative after 15.L10 16.K10 17.L11 18.L9 19.H8*. I must make White block my three so that I have time to set up a good defense.*

15.J12	**16.H12 (diagram)**



Position after 16.H12

If White now tries to make two threes with 17.H11, then a capture and consecutive Black fours will leave Black with a powerful initiative after 18.H9 19.H11 20.K9 21.L9 22.F9 23.G9. 24.M11 or F8. 16.H12 indirectly prevents the double three at H11. Moving to H11 directly gives White a strong game with 17.H12. There would be three main tries for Black from there. Firstly, 18.K9 19.J8 threatens a keystone pair with a three and a powerful attack for White after 20.H9 21.M11* 22.L10 23.K12 24.K9. Black could now win two pairs by extending on rank 9, but Black would subsequently not be able to stop White's attack on rank 12 without major loss of captures. Secondly, 18.L9 19.K9 20.K8* 21.K9 is threatening both N9* and K12. Thirdly, 18.J11 19.F12, where Black cannot extend his three without losing a keystone, and Black will lose many captures while blocking White's three.*

	17.F9

This forces Black to H11 where White can capture it.

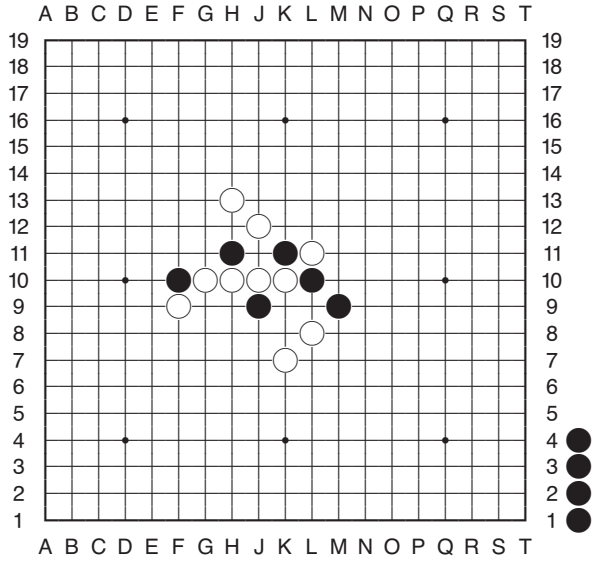
	18. H11

If Black tried to avoid the capture with 18.E8, White would win with a strong four-three combination that holds up despite the captures, with 19.H11 20.H9 21.H11 22.K13 23.K9 24.K8* 25.K9 26.J6* 27.L8 and wins next move.*

19.H13*	**20. H11! (diagram)**

This is perhaps my favorite move of the tourney at this point. In all of the other numerous games that I had seen this position, Black captures the pair here with 20.G14, but I realized that in some variations Black might need to play H12 in order to threaten one of White's pairs or continue an attack without Black's pair being captured. This turned out to be ultimately important in the upcoming unexpected variations. Black can always capture the pair later or if White blocks it instead, Black will get a good attack.*

I am feeling pretty good about my chances at this point because I had seen a very similar variation in the last round of this tourney where Black had won twice and he did not have the flexibility of having not *captured at this point.*



Position after 20.H11!

21. J11!

I thought that this move was an outstanding novelty and could be considered a beautiful move in its own right had it lead to victory for White. White is attempting to establish threats of threes and fours from this move. This is the move that Mark used in a similar position in an earlier game in this tournament against Don Banks of Canada. The only difference being that Don had made the capture at G14. I had not seen this move before that game, so it was new territory. I was scrambling around to find any other games anywhere that had this move by White, but was not successful. Don's response was 20.G14 21.J12 22.H11 23.J11 24.L9, which lost fairly quickly after 25.K9. Now I am not only concerned about my position, I think that it may be lost.

To understand the significance of Mark's move here, the main attempts in a prior round of this tournament by some top players as White in similar positions had failed. Both of the failures had occurred with Black's having already made the disadvantageous capture at G14, which meant that I was in an even better position. To follow these lines, go back and assume that the capture was made in this actual game with 20.G14* 21.J12 22.H11. This leads to the following lines:*

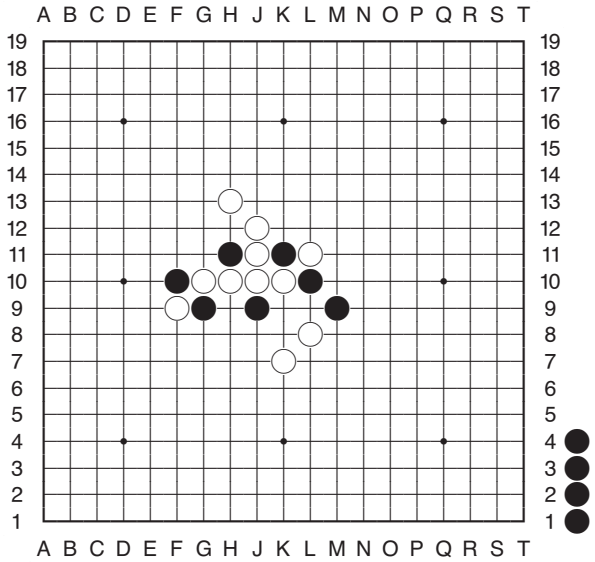
23.M12 24.E8! Now White must prevent J11, which would lead to numerous threats for Black, so 25.K12 26.H12 27.H13* 28.H12. Here White has no way to attack the position without loss of captures that eventually lead to defeat. Black has several good attacking threats at D8, K9, and L9 and is also threatening two captures.*

Or, 23.G12 24.K9 25.L9 (25.J8 26.H9 leads to a loss on captures fairly quickly for White) 26.M11 27.H9 28.N12!! 29.J8 30.G8*, and White will lose on captures in a few moves.*

22.G9!! (diagram)

Here it is, a beautiful move! Black is now threatening to capture five pairs made up of 10 of my 11 stones on the board! I could not find any way to recover.

I spent many hours over two weeks looking over this one. I concluded that this was the only *answer for Mark's novelty. To this point, I have sacrificed two captures, which is standard for this line, to arrive at this position that is threatening five of them.*



Position after 22.G9!!

23.K12

White is protecting the pair and trying to establish threats started with J11. This is probably White's only good try. Unfortunately White now opens himself up to two more pair threats.

24.N8

Interestingly, the extension is finally forced at this point. In many board games there is no reason to make immediate forcing moves or captures until necessary. The goal is to set up a long series of attacking and/or forcing moves that eventually lead to victory. But here, if Black does not extend and immediately plays 24.H12 instead, Black loses a needed threat and gives White a strong position with 25.J13 26.L12 27.M13* (Here, if I had extended, I could play 28.K11 29.J12 30.G14* 31.J12 32.K12* and quickly win on captures.) 28.L9* 29.K9.*

25.O7 26.H12

Black now threatens two more pairs of which one is a keystone pair. If White protects it, the protecting stone is captured. Now you can see the significance of Black not capturing at G14 on move 20. Had Black done so, the pair would be captured with 27.H13, and Black would be in bad shape, down 3-1 on captures with White threatening with a split-3.*

27.G14

White decides to protect a different keystone pair.

This is probably White's best try since he must eventually lose a tempo to protect a pair as Black is threatening five of them. By protecting a keystone pair, White avoids losing two tempos later on, one to protect 'some' pair and one to block the 4. Attempted attacks fail quickly as follows: 27.L13 28.L12 29.M13* (29.J12 30.G14* 31.M13* 32.J12* 33.K13* 34.M12* and wins next move—captures on five straight moves!) 30.K11 31.J12 32.G14* 33.J12 34.K12*! 35.K13* 36.L14* and wins next move.*

Or, 27.J13 28.G14 29.J12 30.L12* 31.M13* (31.J12 32.K12*! and wins in two moves) 32.J12* 33.K13* 34.M12* and wins next move—once again captures on five straight moves!*

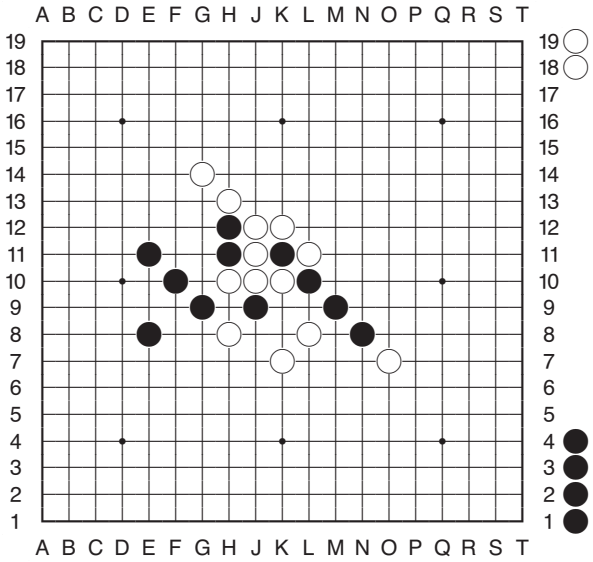
28.E11

I think Black is starting a new attack to try to catch up on captured pairs, which should not be too difficult.

I was actually shoring up my position and making sure that White did not play there instead. If I let White play there, White would get an attack on a keystone pair that Black could not block

without losing another pair. I am still not sure if it was completely necessary, but it made me feel better about the position at the time.

29.H8 30.E8* (diagram)



*Position after 30.E8**

It is finally time to start making some captures. This is one of only two pairs that I can take and not make a pair of my own or have one of my own captured. I may want to capture at L9 in the future to make a split-3 and not lose a pair right back, so capturing at J6 did not look as good here.

31.G8

I am trying a clever trap in desperation. White threatens 33.J8 34.K8 35.L7* capturing double keystones and winning next move.

I had considered White's playing G8 here when making my move at 28.E11 followed by White's block at H8, but I had not looked at all of the subtleties involved, so it had me very concerned for a few minutes. But my upcoming pair attack is strong enough to outweigh it. Once again, any attempts by White to attack lose on captures with many of the same lines shown at move 27.

32.J6*

This only temporarily removes the threat, but evens the pair count at 2-2,which is quite important now.

33.J8

Now White still has the same threat, but with the pair count even Black has enough capture threats to outweigh it.

34.L12*

I resign. Black wins in two moves because after either 35.M13* 36.J12* or 35.J12 36.K12*, Black is attacking two pairs with a 4-3 lead in captures, so he will win on the next move.

What was amazing about this finish is that Black would have captured five pairs in five moves had the game played out. That is something that I had never previously done in a Pente game. Mark is a great tournament player and always pulls at least one surprise out of his hat in a tourney game. In this case, it was two surprises with his moves 21 and 31. So I felt extremely fortunate to pull this one out. ■

Mark Mammel lives with his wife Sharon and baby Samantha in College Park, Maryland. He works in microbiology research and bioinformatics. Mark has been playing Pente on the Internet since 1996 and has organized world PBEM tournaments. He has written a Pente computer program that can be found on his Pente website at http://users.erols.com/msmammel/marksfiv.html.

Gary Barnes lives with his wife Sherri in Lenexa, KS. He has two children, Matthew, 9, and Amy, 7. He has a data processing degree and works as a computer programmer at Universal Underwriters Insurance Co. He has played Chess most of his life and has a master rating in correspondence play. He learned Pente in 1982 but was inactive in the game except for two years from 1984 until he began Internet play in 1999. He has won numerous turn-based and e-mail Pente tournaments. – Ed.

Pente® Rules

Pente is played on a board of 19x19 lines with at least 40 pieces, or "stones," each of two different colors. (Commercial sets are available, although a Go set is ideal.)

The board starts off empty. Play takes place on the intersections of the lines. The first player, White say, places a stone on the central intersection. Black then places a stone on any empty intersection. Play continues with the players alternating turns; each turn consists of placing a stone on an empty intersection. In order to balance the advantage of moving first, White's second stone must be outside the 5x5 square of intersections centered on the central intersection.

When a player places a stone such that a pair of adjacent enemy stones is now bracketed by friendly stones at either end, then the pair of enemy stones is captured and removed from the board. The four stones involved in this capture must be in a straight line, orthogonally or diagonally, with no gaps. If a player places a piece such that a pair of his own stones are now bracketed at both ends by enemy stones in this configuration, then no capture is made. In other words, captures must be secured by an active move by the capturing player. Multiple captures are possible in a single turn.

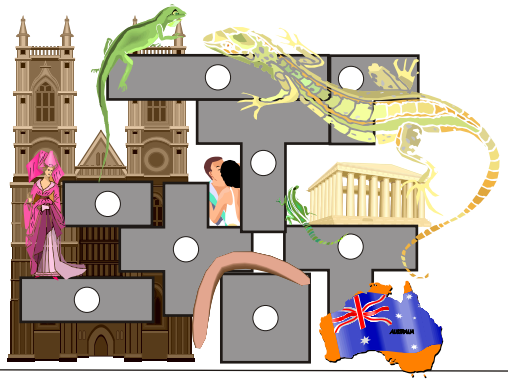
Capture formation: ●○○●

There are two ways to win: (1) a player wins if an orthogonal or diagonal straight line of at least five adjacent stones of his color is formed (2) a player wins if he captures five pairs of enemy stones.

History

Pente was developed in 1978 by Gary Gabrel. It is an update of the traditional Japanese game Ninuki-Renju, which is described in more detail on the Renju International Federation website (http://www.renju.nu/). In the older game, in which *Black* moves first, a line of stones greater than five was not counted as a win. In addition, the Pente opening restriction on the first player's second move was not applied in Ninuki-Renju. Instead, Black was handicapped since his five-in-a-row was not counted as a win if White could immediately capture one of the stones in the Black five. Also, Black (and sometimes White as well) was prohibited from making a double three. The precise definition of double three is a little difficult, and this rule is further complicated by various exceptions. It is easy to see why game players readily adopted Gabrel's simplifications. It is still uncertain, however, whether or not Pente's restriction on the first player is sufficient to even up the game.

Pente became popular, particularly in the USA, in the first half of the 1980's, and USA and World Championships were held. Tom Braunlich, three-time winner of the World Pente Championship, wrote two short books on the game: *Pente Strategy Book I* and *Pente Strategy Book II* (Pente Games, Inc., 1980, 1982). These are well worth reading if you can find them. Although interest in the game has since waned, there is still a large body of enthusiasts on the Internet. Pente sets are available from Decipher (http://www.decipher.com/partyzone/pente/). – KH.



DOMAIN

A tile game related to Othello

by Larry Back

The cover of *AG3* featured Cathedral, an attractive game where players attempt to surround territory with tiles that resemble buildings. The territory-surrounding theme is reminiscent of Go, and Cathedral can reasonably be described as a tile version of Go. Another classic territorial game that is similar in some ways to Go is Othello. So is there a tile version of Othello? Yes, there is, and it is called Domain.

History

Domain was originally marketed in Europe in the early 1980's under at least three different names. Among the other names used for the game were Boomerang in France, Kiss in Italy, and Chameleon in England. In 1983 Parkers Brothers marketed the game in North America, gave it the name Domain, and added the slogan "Where the Challenge is..." to the box cover. Since the object of the game is to end up covering more of the board with tiles of your color, it would seem that Domain is the more appropriate name.

Like Othello, the rules of Domain are simple and there is no element of chance. Unlike Othello, a typical game would last no more than twelve moves per player. Nonetheless, as the slogan suggests, Domain is indeed challenging.

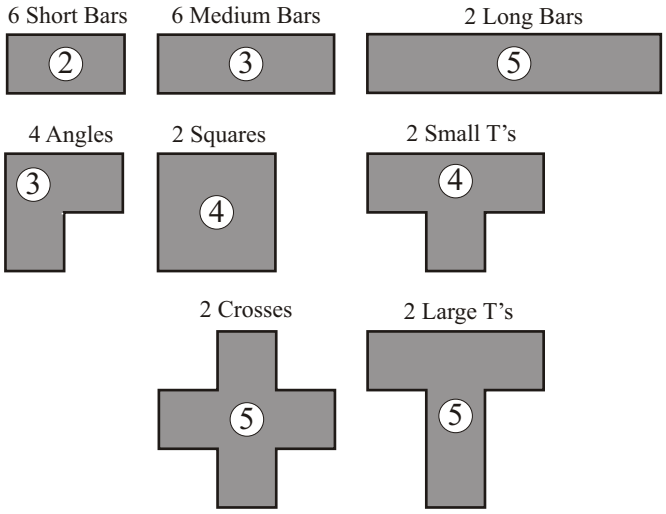
Equipment

Domain is played on a 9x9 square board. The pieces are tiles that cover anywhere from two to five squares. Each tile is blue on one side and white on the other while the playing board is black. The equipment for Domain is of high quality, as it needs to be. The board and tiles are plastic and are well constructed with precision molding. Each square has a hole in its center and each tile has two pegs per side. These pegs fit nicely into the holes and they ensure that a tile will fit perfectly over the squares that it covers. The pegs are also just the right size to allow players to pick the tiles up easily, flip them over, and place them back on the board. These are desirable features that serve to enhance the game-playing experience.

A good picture of a Domain board with tiles can be found at http://www.abstractstrategy.com/domain.html, and a picture of Boomerang can be found at http://www.abstractstrategy.com/boomerang.html.

Tiles

A Domain set comes with a total of twenty-six tiles. The names, shapes, and quantities of the tiles are depicted below. Each tile has a number on it equivalent to the number of squares it covers. This is convenient since it enables you simply to add up the number value of all your tiles at the end of the game to determine your total score. Each Domain tile is necessarily symmetrical so that it can be flipped over and placed back on the board in such a way that it covers the same squares. Thus, there is no 'L' shaped tile covering four squares, for example, since it would not have this property.



A set of Domain tiles for one side

Rules

Like Othello, Domain is a game for two players. One player is Blue, and the other player is White. Either player can move first and moves are alternated throughout the game. To start the game, the tiles are divided evenly between the two players. To make a move, a player selects a tile from his own collection and places it over empty squares of the board with his color facing up. After a player places a tile on the board any tiles belonging to the opponent that are touching the placed tile are flipped over to the player's color. (Two tiles must occupy horizontally or vertically adjacent squares to be considered touching; diagonal touches do not count.) One restriction on placement is that, except for the first move of the game, a tile must be placed so that it touches at least one tile of the opponent. This is a rule Domain shares with Othello, where you must capture at least one of the opponent's discs when making a move. Also, just like in Othello, a player can only pass on his turn if he has no legal move, in which case passing is mandatory. The game ends when neither player is able to move. This will happen with at least two tiles, but most likely more, remaining to be played. The player whose tiles cover the most squares at the end of the game wins. Ties are possible but rare.

Opening possibilities

I counted a total of 171 distinct opening moves in Domain if you do not count symmetry and 1,149 opening moves if you do. There are probably more than a hundred possibilities with each subsequent move until the board starts to become filled with tiles. Therefore, while a program could be written to play Domain, I believe it is unlikely that perfect-play calculation could be achieved from the first move to the last. In other words, Domain is probably too intractable to be solved.

Strategy and Tactics
Similar to Othello, flipping an opponent's tile to your color does little good if it can simply be flipped back again. However, if you can flip your opponent's tile and at the same time surround it, or even surround your own tile, then that tile will remain your color for the rest of the game. Therefore, your goal is to try to surround tiles while limiting your opponent's ability to do the same. One way to achieve this goal is to place a tile on the board so that it is already surrounded. It is important to note, however, that surrounding in Domain is not the same as surrounding in Go. This is because there are no one-square tiles in Domain. Therefore, a surrounded tile may have empty squares beside it provided those squares are isolated.

Even though the game is over quickly, each move must be considered carefully. Each turn is usually a choice between moves that have different advantages and disadvantages. A move may surround a tile but allow the opponent to surround another tile. It is rare that any one move will be obviously superior. Usually the pluses and minuses of each move must be weighed.

It is a good idea to play your bigger tiles at the beginning of the game and save your smaller tiles for the end. Playing your smaller tiles too soon may mean that you are forced to pass on your last few turns as you are left with only big tiles to play and no room on the board to play them.

Soon after I started playing Domain it also occurred to me that it is very important to try to get the last move in each empty region of the board. Placing the last tile in a region of the board ensures that the placed tile will end up your color. Furthermore, many, if not all, of the surrounding tiles will end up your color. For some reason though, despite the fact I had learned to play Othello before I started playing Domain, it did not occur to me that the exact same concept was true for Othello. Amazingly, it would take about six more years before I would learn that.

Popularity
Soon after Domain was published it appeared in *Games* magazine's Top 100 list two years in a row. However, after that it disappeared from both the list and from store shelves. One reason for its lack of popularity may be the fact that Domain is a little too abstract for some people. There is no concept of attack or defense; the tiles cannot be thought of as soldiers in a battle the way that, for example, Chess pieces can; and you cannot invade an opponent's territory the way you can in Go. Nonetheless, each game does provide a challenge, and it is unlikely to be boring.

Alternate rules
The rules I have described are actually the second of three versions that come with the game. The first version is like the second, but both players play from a common pool of tiles, and there is no requirement to place a tile so that it touches at least one of the opponent's tiles. The third version is also like the second except that all tiles, both blue and white, which are touched by a placed tile are flipped over to the opposite color. As for strategy, each version has its own unique considerations.

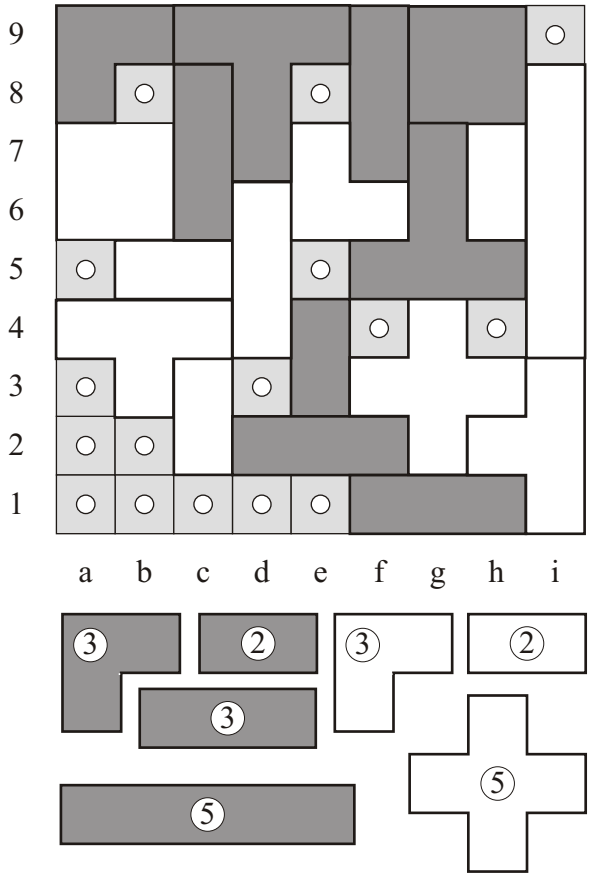
Of the three versions of the rules my favorite is the second. It seems that the second or 'Intermediate Level' version has more strategic depth than the first version as you must consider whether a tile from your own collection is best played on your next move or saved for later. You must also consider what tiles remain in your opponent's collection. The requirement that you must flip at least one of your opponent's tiles also enhances the strategy. For example, you probably want to flip as few tiles as possible with each move unless you are actually surrounding them. The fewer tiles you flip, the fewer options you leave for your opponent on his turn. This is a strategy idea that also occurs in Othello.

The third or 'Expert Level' version may have just as much strategic depth, if not more, than the second. Certainly, envisioning the position a few moves ahead is harder since, in addition to flipping your opponent's tiles, you may have to flip some of your own with each move. And the tactics can be trickier because making a move that touches and surrounds your own tile actually ensures that it will end up as your opponent's color. However, the idea of flipping your own tiles after a move seems a little unnatural to me. It also seems that positions can be too chaotic in the third version and calculating your best move may prove to be headache inducing. Still, the extra complexity of this version might appeal to some players.

Origin
Unfortunately, information about how Domain came to be invented and by whom remains elusive, which is a shame. A game of this caliber deserves to have the story of its invention known.

Conclusion
All in all, Domain is a very enjoyable game. It is over quickly and yet there are many choices for each of your moves. Finding your best move is rarely easy. While I admit that I have not played a lot of other "tile" games, I am sure that Domain must be considered one of the best from this category.

Endgame position
The following endgame position demonstrates how intriguing Domain can be. Each player's remaining tiles, four for Blue and three for White, are shown below the board. In the position Blue has fifteen legal moves, but only one of them is a winning move. See if you can find Blue's winning move. (Answer on page 29.) ■



Solution to Bashne Problem
1.e5f6 g7:e5, 2.f6:d4 e5:c3, 3.d4:b2 c3:a1+, 4.c5d6 c7:e5, 5.h2g3 h4:f2, 6.g1:e3 f2:d4, 7.e3:c5 e5:c3, 8.d2:b4 wins.

Solution to Domain Puzzle
The key is for Blue to get the last move of the game. Although there is more than one move that accomplishes this the only move that wins is to place an Angle on (b1, b2, c1). This move has the advantage of surrounding and flipping White's Short Bar on (c2, c3) ensuring that it ends up blue. It also leaves two separate regions on the board so that there must be two more moves. White's best reply would be to place a Short Bar on (d1, e1), leaving Blue to place a Medium Bar on (a1, a2, a3). Blue then wins 37-36.

Solution to Orbit Puzzle
O16 is the move. It completes a modest half-orbit connecting the top side to itself, allowing White to follow up with M16. This captures the four-stone Black group, preventing Black from capturing the 12-stone White group along the right side. Now White cannot be prevented from completing, and keeping, a large half-orbit connecting the left side to itself, winning the game.

Solution to Vai lung thlân Problem
4 (if 5, 2 wins for North) / 2 (if 1, 5 wins for South) / then either 5/1/6 or 6/1/5 results in a draw.

The Listmakers

by Connie Handscomb

We make lists. Small scraps of paper with desperate scribbles forecasting our destinies, left somewhere until we are ready to deal with future necessities. If I put my hand into a pocket, I'm sure to find at least one. If I'm not ready to remember, I put the list back from where it came.

My own lists are tidy, they tend to run in neat columns. They are practical, efficient, succinct. My moments are precious, so my lists do not waste my time unnecessarily with what is already obvious to me—they merely nudge my memory by what is likely not to be in future. We can organize our lives around these little bits. Put it on the list, I'll insist urgently. We don't want to forget anything.

Every now and again, I see one lying about which belongs to my spouse. Our individual lists are very different, his and mine. Recently I stared, transfixed at my latest find. It was discovered amidst some clutter on the desk , betwixt several files marked "Miscellaneous"—(*not* mine; it behooves me to mark every file folder "Misc," for what really is the point of it all, then, anyway?).

His list items were scattered randomly into what appeared to be haphazard quadrants. The first item I saw was a practical one: "*clean desk.*" It was followed with one that was more altruistic: "*file games stuff.*" Let it not be said My Beloved is anything if not imaginative!

For all his puttering, I do admit he accomplishes an amazing amount of things with the time allotted him. A miracle of motion. He insists he is simply methodical. You're a plodder, Sweetheart, I tell him routinely, and he responds—unhurriedly—that he is merely systematic. Quite, I admit, with two speeds: slow and slow. Time and again, subsequent to an outing somewhere, and after having waited for what I've considered an inordinately long time for him at our doorway, I have called out, Is everything all right? and then walked hastily back with concern to our parked vehicle where he would be found still sitting, carefully putting things away, closing, locking up.

I've got it! I announce one day. We'll put "Hurry" on the list.

You're laughing at me again, he quips.

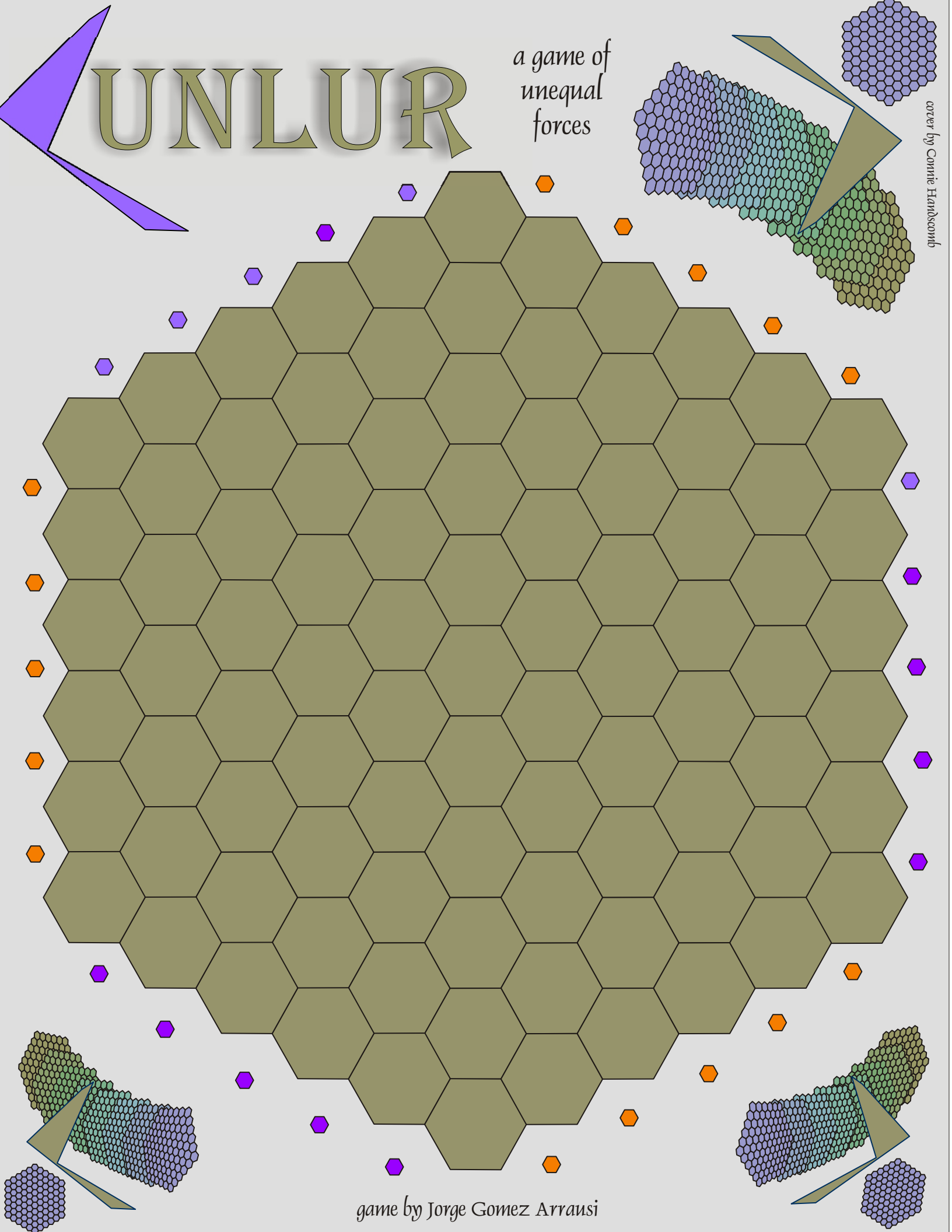
I grin. Broadly.

Index

* = complete rules
† = partial rules

UNLUR

a game of unequal forces



cover by Connie Handscomb

game by Jorge Gomez Arrausi