Abstract Games

… for the competitive thinker

~ Great new games!
~ The History of 3D Chess
~ Dameo and Frisian Checkers
~ Unequal Forces Game Design Competition

Contents

Front Cover
(Bone and bamboo Mahjong pieces, c. 1920, display the special hand called "Thirteen Grades of Imperial Treasure.")

The origins of traditional games have never been satisfactorily established. The most likely reason for this is that the archivists of old did not consider games to be a subject worthy of record. This opened the door to a cornucopia of legends limited only by the imagination of games writers. Mahjong is no exception.

Mahjong is only a little over a century old but unfortunately its birth went unrecorded, or at least has yet to be established. Inevitably, Confucius is a favorite for the honor of Mahjong inventor, making the game 2,500 years old. One reason advanced is that the three dragons represent the Confucian virtues of benevolence, filial piety, and sincerity. At another level, the eight flower tiles have been linked to the eight Immortals of Chinese legend and, for good measure, the eight trinomes of the I-Ching, the Chinese system of divination. Another popular legend, repeated by writer after writer, tells of a fisherman called Sze and his nine brothers, who created the game to stop sailors being seasick.

Time to get down to earth, but first it might be worth identifying the game. Our Mahjong—that is, the so-called Chinese classical game—has three suits (bamboos, characters, and circles), three dragons, and four winds. Eight bonus tiles, four each of flowers and seasons, are commonly included with the set, but are not always used. That is a start, but things then get complicated, for the game is played differently in the USA, Europe, Japan, Hong Kong, Singapore, the Phillipines, Taiwan, and pretty well everywhere else.

There is no doubt that the game originated in China and in particular in the area around Ningbo and Shanghai. It is probable that the game's nomenclature was corrupted by foreigners—the Americans and Europeans who enthusiastically took up Mahjong in the expatiate clubs of the foreign concessions in China before the First World War.

The cold truth is that there is no mention anywhere of the game until the early years of the 20th Century and strangely, no-one, Chinese or European, has ever come forward to claim its invention. I researched some 40 books of reminiscences of life in and around Shanghai during the years approximately 1870-1910, and not one of them mentions Mahjong. Three sets of 'Mahjong' are known to be dated about 1880, but the distribution of tiles, which varies between the sets, does not correspond to the game we know today. In short, they were used for games that were arguably close to, but arguably too were not Mahjong as we know it. Mahjong tiles equate to playing cards; in other words, they can be a vehicle for many games rather than confined to one.

To find the ancestor of the game we need to travel back in time. China has a long history of playing cards, dice and dominoes, which have always been closely linked. The first paper money was issued in China and money cards, very roughly equivalent to the suits of Western playing cards, soon became popular, probably because they gave their (often impoverished) owners a feeling of wealth. The three Mahjong suits, circles, bamboos and characters, are merely stylized forms of money. The circles correspond to cash—small copper coins with a hole in the center, of very little value. It was the practice of poor Chinese to thread the coins for safekeeping, knotting the string at regular intervals for ease of reckoning. It does not require much imagination to see how these strings of cash were transformed into strips of bamboo, a much more marketable image, particularly in the West. The character suit (wan or won) means myriads or '10,000'; thus the seven of characters means '70,000.'

Two Chinese card games in particular must have been forerunners of Mahjong. Ma-tiao (Hanging Horse), perhaps 500 years old, which had three suits 1-9 with four of each value and four bonus cards, and K'an hu (Watch-the-pot), alleged to go back eight centuries, which had three special cards, Redflower, Whiteflower and Old Thousand, corresponding to the dragons of Mahjong. K'an hu was subsequently marketed in the UK as Khanhoo. Several other old Chinese card games have features that are found in Mahjong strongly suggesting that it is a hybrid game.

Mahjong really hit the West about 1920 when an American expatriate, Joseph Babcock, introduced the game to America, patenting the name 'mah-jongg.' It was an instant success, and within a couple of years it was a nationwide craze. The craze hit England a microsecond later and to a lesser extend mainland Europe. Without the shadow of a doubt, the Mahjong craze of the 1920's in America and England was the greatest games boom ever. 'Learn Mahjong' books rolled nonstop off the presses in both countries, *The Times* published leaders couched in Mahjong terms, a Mahjong cocktail was launched, and High Society adopted the game *en masse*. The wireless was the principal form of home entertainment in Britain at the time. Wireless sets were about the same price as Mahjong sets. Incredibly, in 1923 Mahjong sets outsold wireless sets throughout the country.

The craze passed, as crazes do, in Mahjong's case exacerbated by public irritation at rules changes introduced by entrepreneurs hoping to increase sales, and also by the arrival of Contract Bridge (1926). Decline was swift, although the game has always retained a wide appeal in the USA. Today Mahjong has gained something of its former appeal, but the great boom of the 1920's will surely never be repeated. There have been two developments of significance. A Mahjong museum was opened near Tokyo in 1999. It houses several hundred historical sets, including one owned by the last Emperor of China, Pu-yi, together with over 10,000 documents and artifacts. And in June 2001, a Mahjong Foundation was inaugurated at Ningbo, China. A world Mahjong championship is now on the drawing board. Only one problem: which version will be played?

David Pritchard

Editorial

We only meet to play games face-to-face once or twice a week, and this time is usually spent trying new games. Most of my game playing these days takes place via e-mail. Recently, I have been playing Jetan with L. Lynn Smith, Grand Chess with Tony Gardner, and a selection of the Unequal Forces games with Larry Back.

I like playing by e-mail; it is a good pace for me. There is often a day or two to deliberate a move, but sometimes a flurry of moves may come together if both players are at their computers at the same time. There is never pressure, and a little time to analyze a position is welcome.

As a consequence, we have games set up in various states of play all over the house—I still prefer an actual physical set with pieces that I can push around, even when the game position is sent back and forth with the e-mail. I play via e-mail because of a lack of time and a lack of opponents, but I hold back from total cybergaming.

Before the prevalence of e-mail I used to pay games by regular mail—one could meet one's future wife, get married, change careers, and buy a house, all in the space of the Queen's Gambit! It was such a leisurely affair that everyone sent short (or long!) letters with their moves, exchanging game news or life's philosophies. Because everything was so slow, you could play fifty or a hundred games at once.

And so to this issue. As an experiment this time we have put the board for a new game, 77, on the back cover of the magazine. The rules are printed in this issue. All you need in addition are a collection of coins, such as pennies and dimes, and a pair of regular dice. I envision readers taking their magazine into the pub or coffee shop, and whiling away half an hour or so with this easygoing game. This is exactly what Larry Back and I did last spring in a coffee shop on English Bay in Vancouver, although we drew the board on a napkin. I still have that napkin. It is a souvenir of the first game of 77 ever played. Sound judgment and a little luck are the requirements for victory in 77. It has the makings of a classic dice game.

In this issue Christian Freeling introduces his new game, Dameo. Christian was not content to let things rest with Croda, in the last issue, but created this very interesting new checkers variant. Considerable work has already gone into analyzing Dameo, and some remarkable discoveries have been made in the area of endgame positions with just a few pieces left. We hope to follow up in a future issue.

Other new games in this issue are the three Unequal Forces games, Defiance and Domain, Por'rika and Takat. Defiance and Domain reminds me strongly of Realm, although the two games really do not have much in common. We are still playing Defiance and Domain—by e-mail and face to face—and having a lot of fun with it.

The third installment of the Alice Chess article has been delayed until the next issue because it will fit very well at that time with L. Lynn smith's next article on the development of 3D chess.

Several readers brought up the fact that we have not yet given much coverage to the Go variants. We will have to remedy this. I have always thought of Go itself as monolithic, austere, and perfect. How could this game be improved upon? The reality, of course, is that classical Go is, like Chess, only one of a family of related games. Many of the Go variants deserve some attention because they demonstrate interesting game concepts and because they may well be fun to play. We are therefore in the process of investigating how to include some Go variants in this magazine. We may have something ready by the next issue. In the meantime,

Happy gaming!

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.

I want to thank you again for the wonderful job you are doing with *Abstract Games*. Through your initiative and energy you have made an enormous contribution to the gaming literature. The latest issue is absolutely superb. I particularly enjoy the fine in-depth articles on games such as Realm and Chase. I am inspired to dust them off and play them. Also, you have magnificently incorporated new, invented games. There are several lifetimes of exploration in the first two years of issues.

Lately, I've been totally stuck on Chebache. The game has a delightful blend of lightness and depth. My wife and I play it just about every evening. I've discovered that despite all that die rolling the game has enormous skill and finesse, and when you lose, you can typically trace your loss to one seemingly minor mistake. We've played Dvonn a few times as well. I agree with you that it is the best of the Gipf Project thus far.

Mitchell Thomashow, USA

I greatly enjoyed reading about Chase as a friend of mine just introduced me to it, and I have spent a lot of time designing strategy games using dice. In Problem 1 in *AG9*, some fairly elaborate maneuvering led to White's eventual victory, which was well described in the solution. I believe, however, that I have found another path: F9G2/G2F3 followed by G2:G6. As the Grey 1 is the only mobile piece, there is little Grey can do about this maneuvering. The only piece freed up by F9G2/G2F3 is the 6 at I7, but it can not reach anything of interest. Did I miss something?

Luke Weisman, USA

The edition I have of Chase is not the TSR edition mentioned in the article. It was published by Blue Dolphin Games, copyright 1985. Blue Dolphin was apparently Tom Kruszewski's own company. The board is about 20" x 20" of standard folding game board construction, printed in black on a cream-colored paper, and the dice are green and red in cloth drawstring bags. Included in the box is an off-print of a laudatory review from *Gameplayers Monthly*, Vol. 1. Number 2, August 1985 by Gerry McNeal. Also

included in the box are order forms. The game was $15.95, but if I got someone to buy one, I would get a $3 direct commission. If he got a third person to buy one, I would get a $3 indirect commission.

I especially enjoy Connie's occasional essays. It gives me some insight to what my wife must of thought when we got married and I bought myself all of George Hodge's Shogi variant sets as a wedding present to myself. (It really does take two hours to set up Tai Shogi, if you've never done it before. Then you leave the room, and come back to discover that the cat has taken an interest in playing Tai Shogi, too.)

I am glad you have chosen to publish *Abstract Games* as a paper publication. Web publishing, while cheap and easy, is essentially ephemeral. On the other hand, a paper publication can potentially exist indefinitely, to the benefit of future generations. My grandchildren will be able to read my copies of *Abstract Games* after I'm gone, and think, "Wow, Grandpa really was a wacky old coot!"

John Lawson, USA

If I understand the Take the Brain rules correctly (and I think so) you have forgotten two different solutions to the problem in *AG9*. They are b1b2 and b1d2.

Jorge Gomez Arraussi, Spain

Should any of your readers be interested in acquiring a 'quality' copy of Realm, the answer lies in Germany. Quite a number of years back the firm Bütehorn Spiel published Blockade by Sid Sackson. This incorporated a superb version of the Realm board plus the pieces, although some improvisation is necessary with the pieces. Bütehorn no longer exists to my knowledge, but certainly up until very recently there were plenty of copies of Blockade still to be obtained on the second-hand games market in Germany.

Derek Carver, England

Thank you for including the rules to the game of Congo. I did not know of its existence and am finding it a great game. I have been doing a lot of study on the play of the game and would suggest the addition of how to handle ties. If one or more players are both blocked during the same round, then I do not think the second should receive the points of the first being blocked. The rules did not address this situation. It seems that the game is primarily played offensively, and there are a number of patterns which can be set up to secure positions while not actually having

to play at those locations. It is helpful also to be able to spot these patterns when an opponent is setting them up because then they can be blocked. I would suggest adding another option where if one player connect two or more sides of the board and enclose another player's pieces, then the player enclosing the other could receive, in points, the number of the enclosed player's pieces. Anyway, I have had hours and hours of fun with Congo. Thanks again for the great work you are doing.

Jim Polczynski, USA

In *AG9* you asked for readers to write in what they like and don't like about the magazine. To begin, with the covers are always beautiful. They show that abstract games can also be aesthetically pleasing as well as mentally challenging.

The background material in the articles on V. R. Parton and Salta in *AG8* were a nice change of pace from the usual analysis. There is always an interesting mix of games in each issue—the old with the new, the obscure with well known. Although I do have to say that Realm, Chase, and Miller's Thumb were all a bit too byzantine for my tastes.

I think the annual design competition is wonderful. It promotes abstract games, gives a forum for games designers to show off their ideas, and provides us players with a whole batch of new games to play.

The optimum number of pages for an article seems to be three pages or less. I find that once an article reaches four pages it begins to overstate itself. Also, short articles allow for more articles per issue.

Certain games, such as Zèrtz, Chu Shogi, Grand Chess, and LOA get a lot of exposure in your pages. These are all fine games. But there are numerous other great abstract games out there that haven't received any attention. My favorite family of abstract games is checkers, and I would like to continue to see articles regarding different checkers variants.

And my number one suggestion for *Abstract Games*: having it published more then a mere four times a year!

Donald Woods, USA

Is Connie at peace already with the neglect and tribulations she has to suffer? I missed her little column in the last issue!

Pieter Cuijpers, Netherlands

Correction

In *AG9* Professor John Leslie was credited as being the inventor of Royal Carpet. Of course, it was actually Professor Don Green. Our apologies to both!

Game Reviews

Hive

Designed by John Yianni

Hive is a fascinating new game. It is played without a board. Each player has 11 hexagonal pieces, consisting of three soldier ants, three grasshoppers, two spiders, two beetles, and one queen bee. The objective is to surround the opponent's queen bee on all six sides. The surrounding pieces may belong to either player. The playing area starts empty, and the players take turns either to play a new insect to the table from their stock or to move one of their insects they have already placed on the table. A player must play the queen bee within the first four turns. A piece must always be played to the table or moved so that it is contact with another piece in the array (know as the *hive*) at the end of the turn.

Each type of insect moves differently. In this respect, the game might almost be considered a chess variant, if one defines a 'chess variant' as a game between equal armies of pieces with differentiated movement, with the objective to capture a single opposing royal piece. Even so, I think Hive stretches the definition, and the game must be regarded as one of a kind. The queen bee moves one space at a time; the beetle also moves only one space, but may, unlike any of the other pieces, move on top of another piece, thereby immobilizing it; the grasshopper jumps over any number of pieces of either side to the next empty space beyond; the spider crawls three spaces around the hive; and the soldier ant can move to any other space in the hive.

A very important rule is that at no time may the hive be disconnected. This is the case even if the disconnection is temporary while a piece is moved from one position to another. Much of the tactical interest seems to stem from this rule since even the movement of otherwise extremely mobile pieces like the soldier ant can thereby be restricted. Strategically, tempo seems to be an important consideration—if a player gets the upper hand so that his opponent is forced to defend successive attacks, it may be difficult for the defender to recover.

With experience, the character of the pieces and the way they interact ought to suggest favorable opening combinations. An obvious first move is a beetle play; then, when your opponent places one of his pieces down, you can move your beetle on top of it. However, your opponent can then threaten your beetle with one of his own.... Remember: the queen bee must be played within your first four turns, and having a queen immobilized under an enemy beetle will be a big strategic disadvantage.

A number of other possible insect pieces might suggest themselves. However, I think the game as it is is nicely balanced with a good mix of pieces. The chunky wooden pieces are pleasant to handle, and the insect representations are striking and colorful. My one complaint is that the backgrounds used to distinguish the two players' pieces—metallic blue and silver—are difficult to differentiate under some artificial lights. Nevertheless, Hive is an excellent game.

Gen:four:two, 55 Cheddington Road, Edmonton, London N18 1LU, UK. Website: http://www.hivemania.com/. Cost: £20

GRYB

Designed by J. D. Barnhart

GRYB is an acronym for Green, Red, Yellow, Blue and refers to the color sequence of *nodes* on the board. The GRYB board is a very interesting construct. It starts off with a *head node* in the center of the board. This head node splits into the four first level nodes, known as a *quadrangle*. Each of the first level nodes splits into four second level nodes in a quadrangle. These in turn lead to third level nodes, and lastly to fourth level nodes. (This kind of construction, if continued, would create a fractal pattern.) The diagram shows the head node and the first two levels.
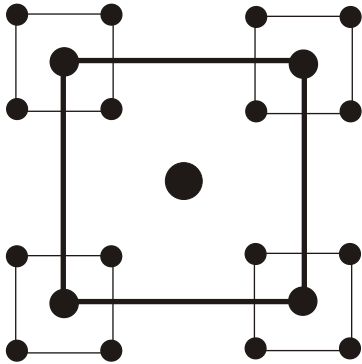
The nodes around each quadrangle are colored Green, Red, Yellow, and Blue, from top left going clockwise. There are $1 + 4 + 16 + 64 + 256 = 341$ nodes in total, roughly equivalent to the number of points on a Go board. In GRYB a piece may typically be moved on the board either *downwards* to any of the sub-nodes on the quadrangle one level down, or *upwards* to the corresponding node one level higher, or *horizontally* to one of the adjacent nodes in its own quadrangle. Thus a piece on one of the middle levels may have a choice of up to seven other nodes to move to. This corresponds closely to the eight adjacent points on a squared board, provided one allows diagonal moves, although the nature of the connectivity is completely different.

The notation used is interesting. The position of a piece can be uniquely described by a string of letters G, R, Y, and B, which describes how to reach the piece from the head node. A node on the first level is thus represented by one letter, a node on the second level by two, and so on. This notation is useful for scoring in the most complex version of the game.

All variants are for two players. In the simplest version pieces are entered from the top level and the objective is to align four of your pieces on the four nodes of a quadrangle. A four-color die is used to indicate the color to which you should move a piece next. Pieces may be moved either downwards or horizontally. A horizontal move must capture an opponent's piece.

The next step in increasing sophistication is to dispense with the die. Pieces must be entered through the head node, and players make two moves per turn. Movement may be downward or horizontal. The objective is to get four of your pieces on the four nodes of a quadrangle.

In the most complex game the wining alignment of four pieces on four colors may be split between four different quadrangles on the same level. There is a scoring system in which patterns in deeper levels are awarded more points.

The inventor encourages experimentation with the game, and he lists a set of parameters for adjusting the rules in any of these versions. Generally, my preference is for a standard version of a game, on the assumption that there has been sufficient testing

to make such a choice. There are so many games, and time is limited, that it is impractical to test many variants of one game. Actually in this case we mostly played the version without dice in which winning alignments must be obtained on a single quadrangle. The game with multiple quadrangles and scoring seems to be very challenging, although the difficulty of visualizing winning combinations is daunting—no doubt a few more practice games would have enabled us to overcome this.

The game appeared to work well, and I think it is a very good game. However, the GRYB board is a striking and original field on which to play games. It still has regularity, but it is a complete departure from our standard tilings of squares, triangles or hexagons. The GRYB board seems to scream for an attainment game in which pieces are entered on the bottom level and the objective is to move a piece to occupy the head node. Another possibility that occurred to me is using the board to play a Go-like territorial game. On the other hand, what type of game of unequal forces can be played on the GRYB board if one player's pieces are entered from the head node, whereas the other player's pieces enter at the bottom level? Recently I encountered Quadrangle Chess, a chess variant played on a smaller version of the GRYB board. No doubt readers can think of many other possibilities.

The colorful board is printed on cotton. The only other game components supplied are the four-sided die for randomly selecting colors and a fabric bag for keeping pieces in. The board alone can be purchased separately. It is suggested that players use pennies and dimes for pieces, although we used small Go stones. The game is therefore inexpensive and highly portable. GRYB is recommended for those interested in a new type of alignment game, or for game inventors looking for a new field of play. – KH

Book Review

Schaak en Superschaak: *van schaker tot Superschaker*

Dr. H. Van Haeringen (Coulomb Press Leyden, Leiden 1999)

Dr. Van Haeringen published the rules of his game Superchess, and a related game Monarch, in English back in 1993. In 1999 he published what must be one of the handsomest books ever produced on a chess variant. The large-format hardback book (in Dutch) has 176 double-column pages with big, clear 4" x 4" diagrams. The text is a greatly enlarged version of the 22-page English booklet which was confined to rules of play. The new book includes annotated games, positions, and problems, as well as the laws of the games.

Superchess is not in itself a game; rather it is a menu of options. This is chess free-style, with players determining prior to play which pieces, starting position and board they want to play with. Superchess offers a mind-blowing 50 new pieces to choose from. The moves of all 50 pieces are fully described, and in addition these are conveniently illustrated on a double-sided card included with the book. A few of the pieces will be familiar to variant players, but most will not as they are the creations of the

inventor's imagination. The game concept is not original. Ralph Betza's Simple Armies (1980) and Bruce Gilson's Free Choice Chess (1984), which offers a selection of 17 different pieces, had much the same do-it-yourself idea.

The book includes four annotated games of which the first three involve the Princess (B+N) and the Amazon (Q+N). Game 3 runs to just ten moves when the author offers two diverging lines running to 19 and 32 moves, respectively. This game covers no less than nine double-column pages, nearly all analysis. In Game 4 two exotic new pieces are introduced, the Elephant and the Herald. One Herald moves once in this game. I would have much preferred to see the considerable space taken up by these games to have been used to demonstrate the interaction in game situations of some of the other pieces.

Anyone can of course invent chessmen with new moves. But it is not as easy as that. Arguably, certain combinations of pieces harmonize whilst others do not. (One reason that the established forms of chess are such good games is because of the interaction of their pieces.) The author does not mention this important aspect of chess games, and the reader is left to discover which pieces work well together and which do not.

My initial reaction to Superchess was to be totally overwhelmed by all the new pieces. However, it must be borne in mind that one is not expected to digest them all in one sitting. The idea is to agree perhaps one or two new pieces in place of existing pieces when first playing a game, and then to absorb selected new pieces gradually.

Monarch I found to be a somewhat perplexing postscript as the game seems to be simply a version of Superchess played on a 10x8 board or 10x10 board.

The inventor considers Traditional Chess to be imperfect (many would agree). His aim is to improve Chess (an aim held by other ambitious but failed variant inventors of the past). He is hopeful that Superchess will one day be developed into the 'perfect' game, something of a pipe-dream, I fear, for who is to determine what constitutes 'perfect'?—apparently a consortium of expert Chess players, according to van Haeringen. He foresees that these, 'after years of practice,' will eventually achieve the ultimate chess game—best possible piece combination, starting position and board size. I regret that I do not share van Haeringen's optimism. An inventor of a chess variant, however good the game, must face some unpleasant facts:

1. Recruits to chess variants come almost without exception from the ranks of chessplayers, often, let it be sadly said, because they failed as chessplayers;

2. In adopting a new variant, a Chess player is being asked to discard the accumulated knowledge of years, perhaps decades, of experience and study;

3. A new chess variant (and nearly all old ones come to that) lacks the infrastructure that Chess players enjoy—the clubs, tournaments, national and international events and the vast library of information and literature that has grown over the centuries.

It is small wonder that support for chess variants has always been limited, but at least in one direction there is light: each new variant will offer themes for problemists and Superchess, with its horde of new pieces, must offer enough themes to fill anyone's lifetime.

David Pritchard

In *AG9* we reviewed the game Proteus. Kadon Enterprises have requested that we mention that they publish a game with the same name: http://www.gamepuzzles.com/abstrct1.htm#PR. The outcome of this situation has yet to be resolved. – Ed.

Other Reviews

G8 Game Timer

The G8 Game Timer by Dream Green is a useful little device for those wanting to time any game they might be playing. It has the following features:

- Time limits can be set for one to eight players;
- Time limits of up to 10 hours can be set for each player;
- Variable times can be set for each player, as required for things such as handicaps;
- Maximum time per turn can be specified;
- Some sound and display options can be varied;
- A delay can be included between the player's turns.
- Two completely different sets of options can be saved.

Since this product is usable by up to eight players, it really comes into its own for multi-player games such as Monopoly, Scrabble, Chinese Checkers, Halma, etc. In any group of players there is always one who is chronically slower to move than the others, and therefore a potential source of frustration—the G8 is the solution to this problem. Even for two-player games, the G8 is, in many respects, more useful than a standard chess clock.

The numbers on the G8 are quite large and easily visible, so you do not have to look long nor hard to see what time you have left to play. The only real problem I had with this product was learning how to use it properly, in large part because there are so many options. To be fair, though, it usually does take a while to get used to any new electronic gadget. Just do not expect to unpack the G8 and be able to use it properly in a couple of minutes!

Having said that, this timer is a useful and versatile product. You can use it just as well as any chess clock and for much less money than many of the chess clocks on the market.

In conclusion, the G8 is a good product for anyone in need of a good, compact and versatile game timer. While being especially well suited for game competitions and tournaments, it can be used just as easily for less formal settings for those wishing a good timer. For the longer multi-player games that are difficult to complete in an evening, the G8 may prove to be invaluable.

<div align="right">Malcolm Maynard</div>

Dream Green, P.O. Box 2347, Weirton, WV 26062, USA
E-mail: sales@123oy.com, fax: (304) 723-4559
http://www.123oy.com/Games/Game%20Timer.html
Cost: US$32.95

Abstract Games in Nuremberg:
Needles in a Haystack

The International Toy Fair in Nuremberg, Germany, is the biggest international business-to-business fair for the toy industry and trade, with a customer range of over 120 countries. The 53rd fair, in February this year, attained a new record with 2,837 exhibitors from 57 nations on 160,000 m² of gross display area. Journalists enjoyed free admission and even had free parking lots reserved near the main entrance. When I was asked which country I wanted to be displayed in my media pass (to be worn in a visible position), I decided "Canada because I work for *Abstract Games*."

There were model railways, video games, Christmas decorations, joke articles, dolls, and plush toys, and many other things in 16 large halls, more than enough for the six days the fair lasted. I was mainly looking for new abstract games and game books in four of the smaller halls. It was my first disappointment when I realized that there was only one book publisher who, even worse for me, was only selling children's books. I tried, sometimes with the courage of despair, to find new challenging abstract games and walked the corridors for hours, passing by hundreds of stands. I felt overwhelmed by teddy bears, soap bubbles and rubber dinghies, although, according to the map, these halls were reserved for "books and games." To be honest, there were a few exhibitors who offered beautiful game boards for traditional games such as Chess, International Checkers, Morris, Backgammon, Awele, and Go. These were bright moments. I also discovered a few modern classics, for instance Tantrix and Abalone. Perhaps once in an hour I found a new abstract game.

Ravensburg will publish Pueblo in April 2002. The aim of this game is to build a tower together with your opponent while the construction site is circled by a neutral chief who gives penalty points for every colored piece he can see. Afterwards the tower is demolished piece by piece while more penalty points are given. This game, which has no element of luck, is always 52 moves long (each player has 13 pieces). Gigamic's new release is named Sahara. After I showed them the game can easily be drawn, the exhibitor admitted that Sahara is flawed. I observed at the fair a tendency towards short and shallow games. Gigamic told me that longer games would be "too difficult for normal people" and would not sell well. I also went to the stand of Piatnik, producer of Malawi, one of the best abstract games of the 1980's. Now they have San Gimignano on the market, a game named after the famous Medieval 'Manhattan' in Tuscany, Italy. While its rules are fully abstract, the design of the board looks a little confusing. It seems that even the few new abstract games that get published have to look like non-abstract games to make them palatable for a wider clientele. However, this might not be true everywhere as an Italian game publisher told me that in Italy electronic games do not sell at all, whereas abstract games are very popular. I also have the impression that abstract games are still going strong in France and Japan.

The highlight of the fair was Kris Burm, who had his own stand. To me, he is not a game inventor, but rather a brilliant artist who creates games like Rembrandt created paintings. I won a game of Dvonn (*AG8*) against him by one point. This wonderful new game reminds me of the mysterious and obscure qualities of Go called *shugen* and *shin'o* in Japan. It feels very elegant, but unlike any other of the hundreds of games I tested so far. Believe me, your life is incomplete without Dvonn! Another outstanding game is Blokus, which was invented by the Frenchman Bernard Tavitian in 2000. It has extremely simple rules, but offers a wealth of tactical and strategical challenges. Blokus may well become the game of the new millennium: it sold 6,000 copies in France in its first year and 20,000 copies last year. The first tournaments will be organized soon. Dvonn and Blokus alone would have been sufficient to make my visit to the fair worthwhile; however, these were the only new games there, along with Pueblo, I can recommend.

<div align="right">Ralf Gering</div>

"The passion for playing chess is one of the most unaccountable in the world. It slaps the theory of natural selection in the face. It is the most absorbing of occupations. The least satisfying of desires. A nameless excrescence upon life. It annihilates a man. You have, let us say, a promising politician, a rising artist that you wish to destroy. Dagger or bomb are archaic and unreliable—but teach him, inoculate him with chess."

<div align="right">H. G. Wells, "Certain Personal Matters," 1898</div>
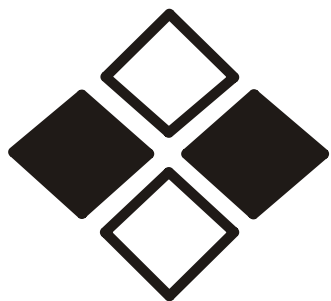
Unequal Forces Game Design Competition

While it did not garner as many entries as last year's competition, the Unequal Forces Game Design Competition still attracted over 40 entrants. Perhaps the smaller number of games was due to the difficulty of designing games that offer fairly even winning chances for the two players. Beforehand we had been concerned that we might just get a collection of Fox and Geese variants. This was not the case. Although some of the entries did investigate the Fox and Geese theme—a number of them with considerable originality, it should be emphasized—all of the established genres of abstract games were represented by games of "unequal forces." There were unequal forces chess variants, checkers variants, a connection game, some attainment games, and even a mancala game. A number of them were simply unclassifiable.

One of the competition judges made the very good point that when you have unequal forces in a strategy game one side must theoretically start with an advantage, and that all of these games are perhaps best played in pairs, the players taking different sides, with some accounting system to determine the winner. This is a good idea, but I see no reason why an unequal forces game can not theoretically be drawn with best play on both sides. In this respect, these games are no different from games in which there is a symmetrical starting position. For that matter, unless there is simultaneous movement, *no* abstract game is completely balanced because one player must move first—the starting position for the second player must of necessity be different from that of the first player.

In most cases, of course, the imbalance caused by the first move is quite small, but in some games, notably Gomoku, the first move is a crushing advantage. Japanese players decided Gomoku was worth saving, and over a period of several decades gradually introduced a series of modifications to balance the game, eventually creating modern Renju—essentially, a game of unequal forces!

Because of the large asymmetry in games in which the players start off with different armies, different objectives, and so on, a balance of winning chances between the players is clearly much more difficult to attain. It is obvious from many of the competition games that their creators must have struggled with this reality, some of them more successfully than others.

Nevertheless, I believe it is worth persevering with these games for the very good reason that radically different strategies and tactics may be required of the two players in a single game of unequal forces—the interplay of the different strategies can provide a fascinating gaming experience that is more difficult to attain in games that are ostensibly symmetrical. The first game below, Defiance and Domain, illustrates this point perfectly. I urge you to try it! The second game, Por'rika, is a good illustration of an original approach to the Fox and Geese concept. Lastly, Takat is one of those unclassifiable games I mentioned. It initially attracted me because of the minimalism of the playing surface. I have played it a number of times, but I have yet to formulate a coherent strategy.

Within the constraints of a busy life and 40 or so games to evaluate, we have playtested these three games as much as possible. I think they are fairly well balanced, but a more extensive investigation may prove the opposite. If so, perhaps the rules may be adjusted, or a scoring system may be utilized, as recommended above. Like the case of Renju, it is worth a little work to preserve an excellent game concept!

It should also be noted that in none of the three games do the rules yet provide for the possibility of draws. Payers should use their own discretion if repeating or stalemated positions occur.

The actual winners of the competition will be announced in the next issue. One of the games in this issue might win, or not—there were many good entrants.

Defiance and Domain

Defiance and Domain was invented by Arin Sandhop. It is a game for two players, who play the Imperium and the Rebels, respectively. The game is played over a 10x10 board divided into quarters. Each quarter is known as a *domain*. Other equipment consists of two Imperial Commands, one Rebel Command and at least 40 Force Counters for each side. The Force Counters should be marked in some way so that it is obvious which way they are pointing. The inventor recommends using two black rooks for the Imperial Commands, a white knight for the Rebel Command, and checkers for the Force Counters, with directions indicated by the crowns on the checkers. I found that poker chips with a pointed spade symbol embossed on them were particularly convenient to use as Force Counters. The initial position is shown in the diagram below.
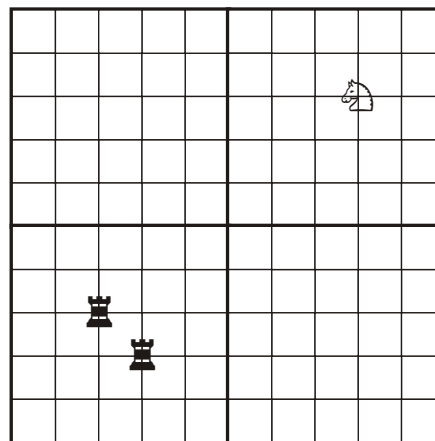
Opening position in Defiance and Domain

Note that the Commands occupy the points where the lines intersect rather than the squares themselves, so for the Commands the board may be regarded as an 11x11 array of points. The Force Counters,

on the other hand, must be placed within the squares, and must be oriented in a specific direction.

The objective of the Imperium is to capture the Rebel Command with one of the Imperial Commands by moving an Imperial Command onto the same point as the Rebel Command. The objective of the Rebel player is to control key points in each of the four domains. A *key point* is one of the central 4x4 array of points in the domain. The Rebel player *controls* a key point if Rebel Force Counters occupy all four squares around the key point. As soon as either player reaches his objective, he has won.

The players take turns to move. The Rebel moves first. Each turn consists of two parts. First, a player places or reorientates a Force Counter; then the player may move a Command. The Force Counter move is compulsory; the command move is optional.

Place or reorientate a Force Counter:
A player places one of his Force Counters on any vacant square on the board except a dead zone—see below. The Force Counter placed must be oriented to face toward either one of the sides of the square or one of the corners of the square it occupies. Instead of placing a new Force Counter on the board a player may choose to reorientate one of his force counters already on the board, in which case it is simply turned to face in the new direction. A player must perform one of these actions in a turn, but not both.

Move a Command:
- The *Imperial Commands* move one space horizontally or vertically along the lines of the board. Diagonal moves are not permitted. The two Imperial Commands may not occupy the same point, but may move onto a point occupied by the Rebel command. In the latter case the Rebel Command is captured and the game is over. An Imperial command may not move onto a point controlled by the Rebel player except to capture the Rebel Command. The Imperial Command is allowed to move to a point surrounded by four Rebel Force Counters provided this point is on the edge of a domain and is not a key point. The Imperial player chooses just one of his Commands to move in a turn, and may not move both.
- The *Rebel Command* moves one space horizontally or vertically along the lines of the board, or may instead move one space diagonally. The Rebel command may not move onto a point occupied by an Imperial Command. The Rebel Command may not move from one point to another horizontally or vertically between two squares occupied by Imperial Force Counters; neither may the Rebel Command move horizontally or vertically between an Imperial Force Counter and the edge of the board. The Rebel Command may move diagonally over a friendly Force Counter or between two diagonally-adjacent Imperial Force Counters. However, the Rebel Command may not move diagonally over an Imperial Force Counter.
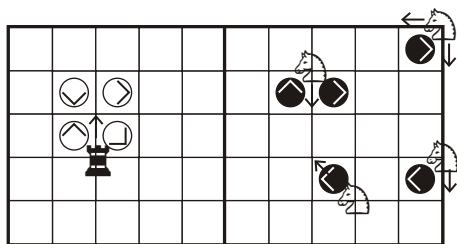

Examples of prohibited moves

Capture of Force Counters and Dead Zones:
If a situation occurs in which a Force Counter is flanked on both sides by enemy Force Counters such that the enemy Force Counters are both oriented to point towards it, then the attacked Force Counter is immediately captured and removed from the board. Usually such alignments of the three Force Counters must be horizontal or vertical, and can straddle domain boundaries. However, if an attacking player's Command is occupying a key point of a domain (and not just on a border point), then such captures can also occur diagonally within that domain. Diagonal captures can not occur across domain boundaries—all three Force Counters must be in the same domain. Diagonal captures can occur retroactively, so that when a Command is moved into a domain any appropriate diagonal captures are made immediately. A player can make a diagonal capture even if the opposing player also has a command in that domain. Captured Force Counters are returned to the player they belong too rather than being permanently removed from the game.

After a capture, and as long as the two attacking Force Counters remain oriented towards the square between them, the square between the attacking Force Counters is a *dead zone*. Force Counters belonging to the other player can not be placed there. Dead zones can be created without a capture, as soon as two Force Counters belonging to the same player are positioned flanking a square and both are oriented towards the square. Diagonal dead zones are created and remain so only as long as the player's Command remains on a key point in the domain. The rules concerning capture of Force Counters and dead zones are exactly the same for both players.
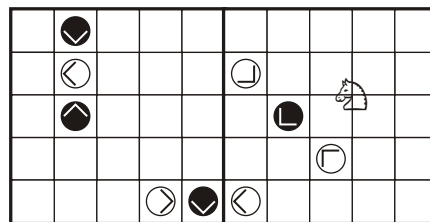

Examples of capture of Force Counters

Variant
The rules as given above are the inventor's original rules. However, in playtesting we have frequently used the rule that, for both players, it is compulsory to move a Command each turn. This rule appears to benefit the Imperium, and may be used to balance the game more finely. We also assumed that a Rebel Command hemmed in by Imperial Force Counters and unable to move simply missed a turn. Some players may wish to count this as a loss for the Rebel player—again, the correct choice will depend on the exact balance of play determined after more extensive playtesting.

Por'rika
Por'rika is a two-player game. On a far planet there is an amphibious alien race called the Schelati. Since time immemorial, the Schelati have laid their eggs in the Sacred Waters, or *por'rika* in their strange trilling language. The Sacred Waters are located in the prime hunting territory of the Ser'ra, large birds of prey which are the Schelati's only natural enemy. The periodic struggle of life and death this necessitates has been represented by the Schelati in this game they devised, and which was brought to us by Terry Alber. The diagram below shows the Por'rika board.

The shaded triangles at the pointed end of the board represent the Sacred Waters. The Ser'ra have four pieces. They are initially placed on the four marked triangles at the pointed end of the board. The Schelati have six pieces, two of which should be distinguished in some way as Egg Carriers. The other four are Guardians. The six Schelati pieces are placed on six of the marked triangles at the wide end of the board in any way that the Schelati player chooses.
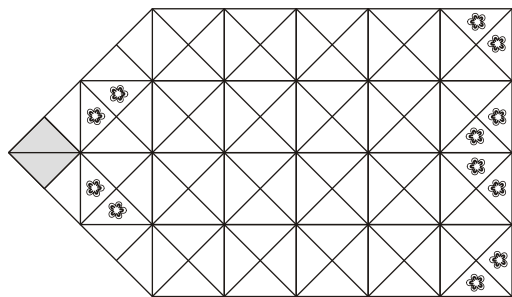
Po'rika board

The Scelati move first. The players take turns to move. The objective of the Schelati is to move both of their Egg Carriers into the Sacred Waters at the opposite end of the board. The objective of the Ser'ra is to immobilize just one of the Egg Carriers.

All pieces move in exactly the same way. Each move consists of two parts. First the piece is moved to the opposite triangle of the square in which the piece starts its move. Then the piece is moved to one of the triangles that touch this triangle at a corner, but not at a side. Both the first triangle it is moved to and the final destination triangle must be vacant.
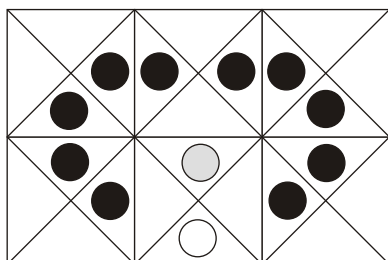
Por'rika movement: white—starting triangle; grey—first triangle moved to; black—choice of destination triangles

If the first triangle across the square from a piece is occupied, it cannot move. In fact, neither piece can move: they are "locked in mortal combat." This immobilization is the equivalent of capture.

Obviously, if the Schelati can immobilize all four opposing Ser'ra with Guardians, the Egg Carriers can romp home unopposed. The strategy of the Ser'ra, therefore, is to dodge around avoiding immobilization as far as possible until they get a shot at an Egg Carrier.

Further playtesting may indicate that the game favors the Schelati. In this case, I suggest a scoring system whereby the Schelati player scores one point for every Ser'ra remaining free at the end. A Ser'ra win can be counted as five points.

Takat

Takat, another two-player game, was devised by William Wragg. The Takat board is shown below. The shaded hexes are red. There are six white pieces and 15 black pieces. They should be flat and easily stackable and fit comfortably within the hexes of the board. One player takes the white pieces, the other the black. White makes the first move.
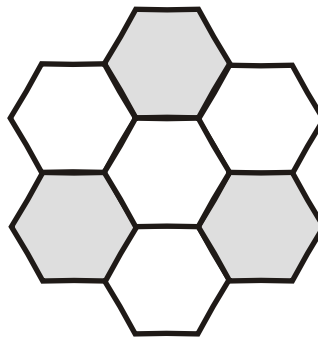
Takat board

White's objective is to create a stack six pieces high. It does not matter what mix of black and white pieces goes into making the stack. White still wins even if the six-high stack is created during Black's turn. Black's objective is to immobilize White. In other words, if on White's turn White does not have a legal move, then Black wins. Although it is an unlikely circumstance, White also wins by immobilizing Black in the same way.

Each turn a player enters a piece of his color onto the board or moves a piece of *either color* that is already on the board. A piece is entered onto the board by placing it in any empty space *except* the central hex. Black must not have fewer pieces on the board than White. If this is the case then Black, on his turn, must enter a piece. If Black is unable to enter a piece in this circumstance, then he may move a piece already on the board instead.

As stated, when a player moves a piece already on the board, he may move a piece of either color. However, only the top piece of a stack can be moved. Also, a piece's movement may be limited if it is a *safe piece*—see below.

A piece may be moved from one stack to another stack on an adjacent hex provided the target stack is not more than one piece higher than the starting stack at the beginning of the turn. Thus a piece maybe moved from the top of a stack that is three high to the top of a stack that is four high (or lower), but not to the top of a stack that is five high. Pieces can always move down to lower stacks, of course.

There are two kinds of safe pieces. Any two pieces of the same color that are stacked directly on top of one another are *temporarily safe*. The top piece may only be moved by the player whose color they are. Three pieces of the same color stacked directly on top of one another over a red hex are *permanently safe*. The top piece can never be moved by either player. There is no restriction on stacking other pieces on top of safe pieces.

Lastly, two stacks that are four or more pieces high and that have the same color safe piece on top cannot be adjacent to each other. Any move that would result in such a position is illegal. ■

This move is illegal as it would result in a five-high stack adjacent to a four-high stack, both with safe pieces on top.
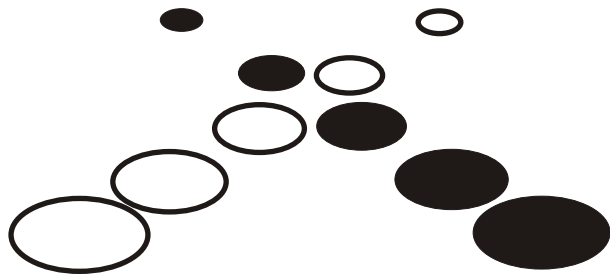
Dameo

by Christian Freeling

I n the previous issue I wrote about Croda, a game that blends the best of Turkish and International Checkers. Dameo owes its very existence to Croda, which is one of the two pillars it is built on. The other pillar is linear movement.

Linear movement

Linear movement is defined as the move of a straight, unbroken line of men of the same color, one square along the line of squares they occupy, provided the square in front is vacant. It includes the move of a single man, which may be considered as a line of one. It does not apply to kings.

Linear movement fuels games like Epaminondas, Phalanx and Bushka (where it is known as *phalanx* movement), and in the process of inventing Bushka I had considered it as a vehicle for movement (not for capture of course) in a checkers game. In International Checkers differences in pace derive from one source only, namely captures. So bringing in a bit of flexibility would not hurt. Apart from that, it is not hard to see that it would open up a new range of tactics.

On the other hand, International Checkers is drawish, and introducing linear movement would not make any difference in that regard. Besides, it is rather crammed in the opening, and I could see forces grinding into interlocking positions, where the winner would be the one with the last tempo on a full board. So I abandoned the idea, and in 1986, for lack of ambition, I abandoned inventing games altogether.

Shortly before SE Fireworks exploded at 120 meters from my house, flattening the neighborhood (Enschede, 13 May, 2000, 22 dead, 1000 wounded, 400 houses totally destroyed, including mine) I was working on "Draughts Dissected," a comparative investigation of a number of traditional and modern checkers variants, including Croda, for the new Mindsports site. The men in Croda are not restricted to moving in the same direction as they capture. This is a big difference in terms of linear movement because it counteracts a tendency to grind into interlocking positions. That is why Dameo happened, quite unintentionally. Its rules fell into place in less than a minute.
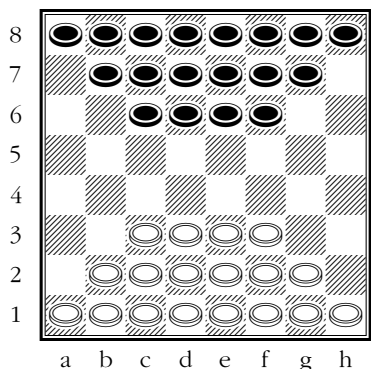
Dameo opening position

The diagram above shows the initial position. The first reason for this choice is a natural tendency of checkers games that allow orthogonal forward movement (e.g., Turkish Checkers and Hexdame) to encourage a build up of forces along the sides. The Dameo opening position creates a certain balance between the center and the sides and demands an economical use of material. The second reason actually came first: it is instantly recognizable.

Rules

White moves first. The object is to leave your opponent without a valid move, either by capturing all his pieces, or by blocking them completely. Draws may occur by mutual impotence or three-fold repetition of moves.

Movement

A *line* of men means a straight, unbroken orthogonal or diagonal line of men of the same color. A man, or a line of men, moves one square forward, either orthogonally or diagonally, into a vacant space. In actual play the last piece of the line one intends to move is picked up and put in front, and that is how the move is recorded. A common opening move, for instance, is 1.d1b3, but 1.d1d4 and 1.d1g4 are also possible (though less common). Of course, it does not have to be the last man of a line: 1.d2d4 is also common. (A single man will move exactly like a Croda man.)

A man ending its move on the opponent's back rank promotes to a king. Kings move in a straight line any number of unobstructed squares orthogonally or diagonally, like a Chess queen. (In contrast, Croda kings may only move orthogonally.) Since a man is only promoted upon *completing* its turn on the last rank, and since multiple captures must be completed, it may have to jump on and off the last rank without promoting, in order to continue capturing.

Capture

In terms of capture, Croda and Dameo are identical, so this is a rerun. Although pieces may *move* diagonally (not as an exception, as in Croda, but as a rule), all captures follow orthogonal lines only. Men may capture by the short leap in any orthogonal direction. Kings capture by the long leap in any orthogonal direction. (The precise definitions of *short leap* and *long leap* can be found in *AG7*, p.15.)

Capturing, whether by men or kings, is compulsory. If a piece makes a capture and is now in a position to effect another capture, it must do so. Thus multiple captures may be made in the same turn. When a multiple capture is being made, the captured pieces are only removed at the end of the turn, and it is not allowed to jump over the same piece twice in that turn, although vacant squares may be passed over more than once.

Majority capture takes precedence: if a player has a choice of capturing options, he must choose the option that results in the largest number of pieces being captured (kings and men counting

equally). When a king has more than one option in terms of captures and destination squares, it must choose its route so that it maximizes the capturing sequence. If there is more than one way to capture the maximum number of pieces, the player may choose.

Coup Turc

Since a capturing sequence must be completed before the men are taken from the board, and since a man may not be jumped twice, Dameo also allows for the "Coup Turc." As an adaptation of the example given for Croda in the previous issue, I will give an illustration in Dameo, using linear moves.
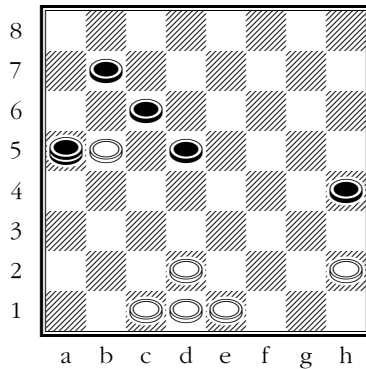
The Coup Turc in Dameo

1.c1e3 a5:c5, 2.e1c3, and there is the familiar pattern: 2....c5:c1:h1:h3. The black king is stopped by the already-captured man on c3, while d2 is still covered by the already-captured man on d1.

Examples

I'll give a few examples of basic tactics using linear movement.
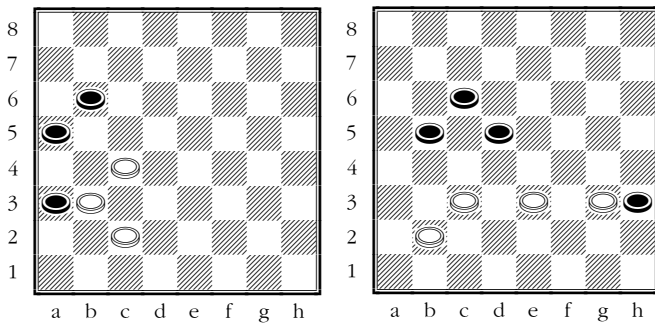
On the left White moves 1.c2a4 (not 1.b3a4? a5b4!) and wins instantly with 1....a3:c3:c5, 2.a4:a6:c6:c4. On the right 1.b2d4 h3:f3:d3:b3, 2.d4:d6:b6:b4:b2 will clear the board.
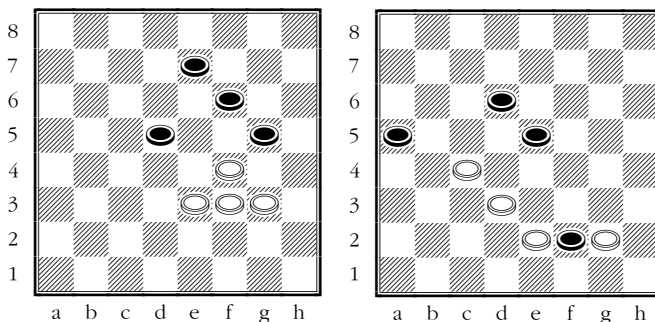
On the left, slightly more complicated: 1. g3e5, d5:f5, 2.f3g4 f5:f3:d3, 3.g4:g6:e6:e8+. On the right, unique to Dameo is the *ladder*: 1.e2b5 a5:c5:c3:e3 g2:f2:f4:f6:c6.

Two kings versus one

Two kngs versus one is a win in Dameo as well as in Croda. The lone king in Dameo may move diagonally, which adds to its escape options, but so may its pursuers, and this proves precisely enough to trap it, yet again.

Problems

Here are four problems. The first three are adaptations of tactical patterns also known in International Checkers and Croda; the last one could not be. In all positions White is to move and win.

Trapdoor

Heelkick

Coup Raphael

Ladder

Finally, here is a selection of further Dameo problems. White is to play and win. Solutions to all problems are given on pages 28-29.■
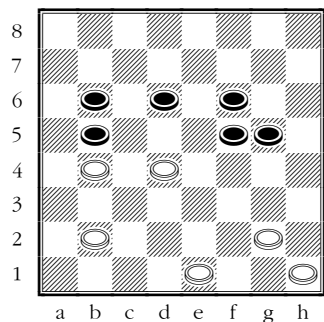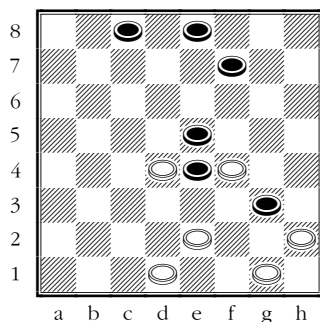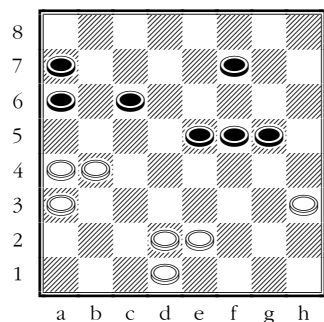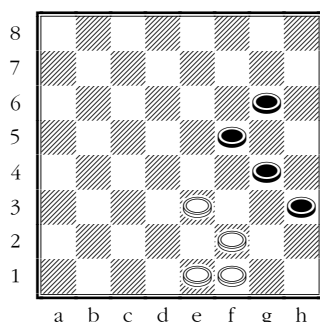

Problem 1
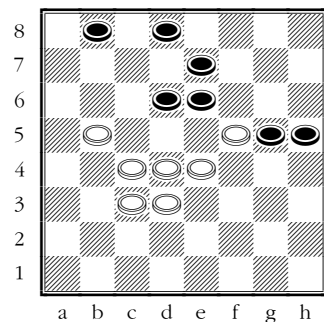

Problem 2

Problem 3

Problem 4

Problem 5

Problem 6

Problem 7

Problem 8

Problem 9

Problem 10

Problem 11

Problem 12

draws, and the computer beats the experts. The same could be said about Chess, but is interest in Chess declining for that?

"Most players do not have expert level. At my draughts club the percentage of draws must be less than 33%. We don't have the problem of draws. At Frisian checkers there are very few draws, maybe 10%. Freeling's Hexdame has even fewer draws."

Several other readers mentioned that Frisian Checkers, as an established game with a low draw ratio, is an excellent alternative to International Checkers. Fred's article following should give readers a taste of this game.
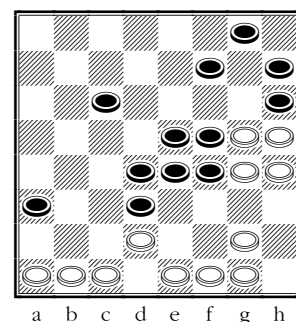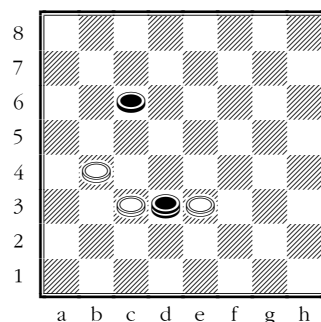
Ralf Gering pointed out that the column checkers variants—notably Lasca and Bashne—are almost never drawn. But perhaps the column games must be considered a special case. Ralf has invented a non-column variant called Sleeping Beauty Draughts that has no draws at all. I hope to include an article on this intriguing game in a future issue. In the meantime, the next issue will contain an article by Ralf on Lasca as well as an piece by Bashne expert Sergey Ivanov on Bashne strategy.
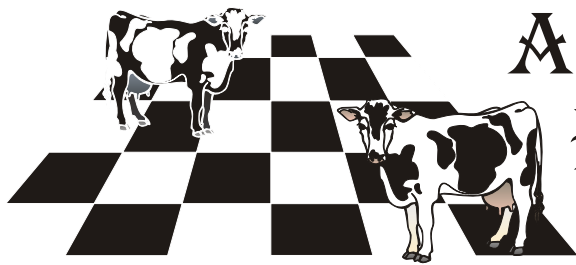
Leaving aside the topic of draw ratios in checkers variants, one or two readers disagreed with Christian about the significance for a game that the top players can be beaten by a computer program. Does it really matter if the world champion is an artificial intelligence? People have different views on this topic, which perhaps we could investigate in a future issue. In any case, Christian also has made the point that some games are very much more difficult to program than others. Go is an example of this circumstance, but also is Christian's own game of Havannah. Christian Freeling has made the following amazing offer:

"I would like to award a prize of **€1,000** for any program that can beat me one (!) out of ten games at Havannah within the next ten years. In my opinion too little attention is paid to games that cannot be programmed. I agree that the very existence of programs that can beat 99% of all Chess and Draughts players need not necessarily keep players from enjoying these games, but it is somewhat annoying all the same to stand corrected all the time by a machine and a clever evaluation function. So I have always felt somewhat surprised that there seems to be so little interest in the phenomenon that some games that are perfectly understandable for humans defy any attempt to formulate an evaluation function. This is the point where the difference in approach is most clearly visible: what is it that we do when we play Havannah that we cannot implement?"

Abstract Games *will organize this "match against the machine," so any challengers should contact us directly. Specific contest rules will be formulated once a challenger comes forward.*

To return to the Croda article, John McCallion is the winner of the problem competition from AG9. The solution is: 1.f1e2 g4:e4, 2.a1b2 a2:c2:c4, 3.e3f4 a3:c3:e3, 4.f4:d4:b4:b6 c6:a6, 5.e2:e4:e6:c6:c8+. Finally, here are two more Croda problems. The simple one on the left is by Christian Freeling, the combinatorial roller coaster on the right is by Leo Springer. As usual, White to play and win. Solutions are on page 29. – Ed.

Our thanks are due to Leo springer, one of the world's foremost authorities on International Checkers, who carefully checked these Dameo problems. Although Dameo is closely related to Croda and Turkish Checkers, Dameo is independently interesting because of its unique tactical possibilities.

The Croda article in AG9 *received a lot of feedback. Many readers appreciated the game itself as well as Christian's analysis, although not everyone agreed with him. Fred Kok had the following comments:*

"I liked the article about Croda, although I do not always agree with Freeling's vision of the future of draughts—especially on the matter of draws. Yes, at the expert level there are many

A Beautiful Move in Frisian Checkers

by Fred Kok

Frisian Checkers is played mainly in the Dutch province of Frisia. The game is at least three centuries old. Dutch writer van Swaanenburg wrote about "Molkwerums dammen" [Checkers from Molkwerum] in 1726. Molkwerum was a village that was compared with a labyrinth—one could easily get lost in Molkwerum….

A similar game is Babylonian Checkers, which was invented in France, I have been informed, but was also played in Scandinavia. The main difference between these games and International Checkers is the method of capture.

Currently, there are about ten Frisian Checkers clubs, with a total of about 270 members. The game had many more followers in the past, but is now growing steadily again. Frisian Checkers got some publicity in the newspapers because of a game between Wiersma, a former world champion of International Checkers, and Wallinga, world champion of Frisian Checkers. It was not the game itself that got the attention of the press—it was played with real cows on a Frisian meadow! But don't worry—you won't need cows to play the game!

Rules

The board and initial setup for Frisian Checkers is identical with International Checkers. As mentioned above, most of the playing rules are also the same. White starts first; unpromoted men are moved one square at a time diagonally forward into vacant squares; an unpromoted man finishing its move on the last rank is promoted to a king. Kings can move in any of the four diagonal directions, any number of vacant squares in a straight line, finishing movement on a vacant square. A special rule in Frisian Checkers is that a player can move kings only a maximum of three times in a row—the fourth move must be of an unpromoted man. This restriction obviously is not in effect if a player only has kings.

The main difference between Frisian Checkers and International Checkers is that capture in Frisian Checkers can take place orthogonally as well as diagonally, so both unpromoted men and kings have *eight* possible directions of capture. An unpromoted man captures by jumping over an enemy piece on an adjacent dark square into a vacant dark square immediately beyond in a straight line. In a diagonal direction this is identical with capture in International Checkers. In an orthogonal direction, however, *adjacent* means two squares away, and a piece would finish its jump four squares from its starting position. The kings capture by jumping over an enemy piece by moving in a straight line, either orthogonally or diagonally, into a vacant dark square beyond the enemy piece, with any number of vacant squares both before and after the enemy piece. In a diagonal direction king capture is the same as in International Checkers.

As usual with the checkers variants, capture is compulsory, and, having performed a capture, if a piece is now in a position to capture again, it must do so. If a capturing king has a choice of destination squares, it must choose the square which maximizes

the capturing sequence. Thus, multiple captures are possible in one turn. The rules regarding compulsory captures are stricter in Frisian Checkers than International Checkers. If a player has more than one possible capturing move, he must choose the one resulting in the capture of the greatest number of pieces. If there is more than one capturing option because an equal number of pieces are captured, then the player must make the move which captures the greatest number of kings. If there is still more than one option, the player must choose to capture with a king, if possible. If a player still has options, he is free to choose. Capture with a king, if necessitated by these rules, supercedes the rule that a player may move kings for only three moves in a row.

As with International Checkers, captured pieces are only removed from the board at the end of the turn, and it is not permitted to jump over the same piece more than once in a turn (although empty squares can be passed over more than once). In order to continue the capturing sequence, a man may have to jump on and off the last rank without promoting.

A player wins the game either by capturing all his opponent's pieces or by blocking them so that his opponent has no valid move. In Frisian Checkers two kings is usually sufficient to force a win over a lone enemy king. Therefore, the International checkers rules specifying a draw in certain three-against-one situations are not applicable. Instead, if one player has two kings and the other player has one, then the player with two kings has seven moves to finish the game. If he is unable to do so, then the game is drawn. Of course the game is drawn if neither player can force a win, if each has just one king, for example. The game is also drawn by repetition if the same position occurs three times in a row.
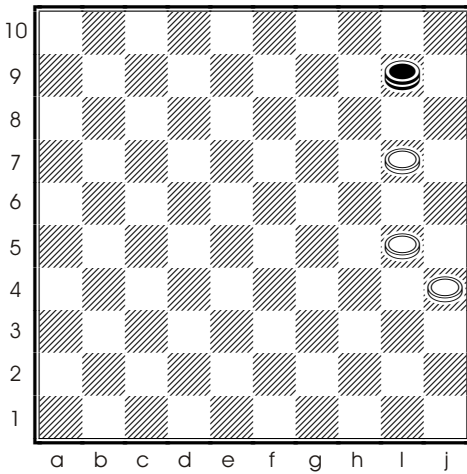
A beautiful move

Before giving a beautiful move I will give three examples of play.

Example 1
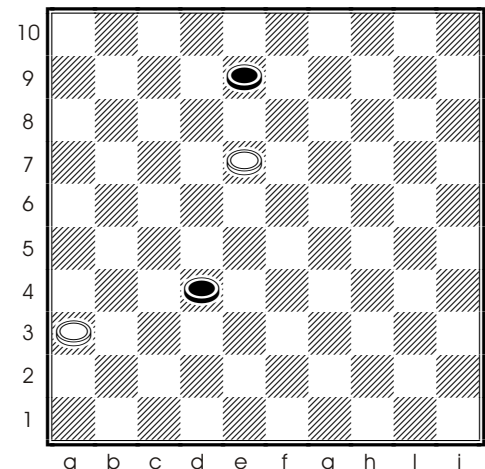
White plays a3b4! Black has to capture e9:e5. Now White captures b4:f4:d6.
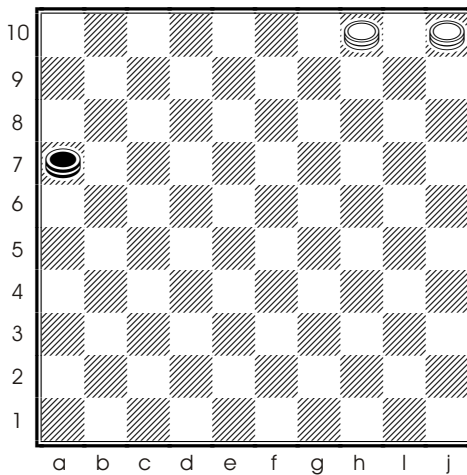
Example 2

White sacrifices with i7j8. Black captures with i9:i1, and now White plays j4i5. Black has the "choice" between i1:i7 j8:h6 and i1:i9 j8:h10.
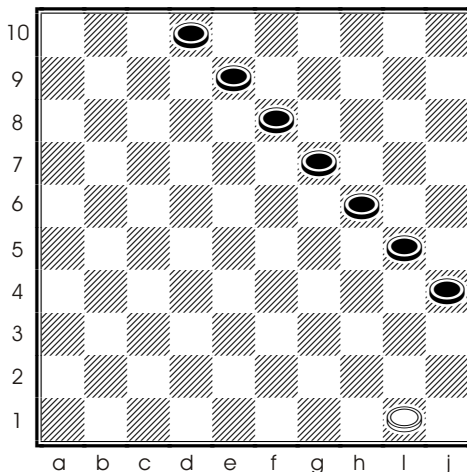
Example 3

In International Checkers the endgame three kings against one king is usually a draw (although there are many interesting exceptions). In Frisian Checkers this endgame is decisive. Even two against one is decisive in most cases!

White plays h10g9, and, according to Black's response, g9f10 or g9j6. (Readers should verify that Black fails in all cases.)

Example 4

The first three examples gave a glimpse of the possibilities of

Frisian Checkers. Now I will end with a special case. I could have chosen a combination 10 moves deep, as I originally had planned. But I decided to pick a very simple but beautiful combination. The position above seems incredible—White has only one piece, and Black has seven.

White plays 1.i1j2, and Black has no defense at all! Look for yourself. It is true! Small wins over big.

Puzzle

White to play and win. This is quite a difficult problem. The amazing thing is that it is two kings versus two kings—it does not look like a win is possible. (Solution on page 29.) ∎
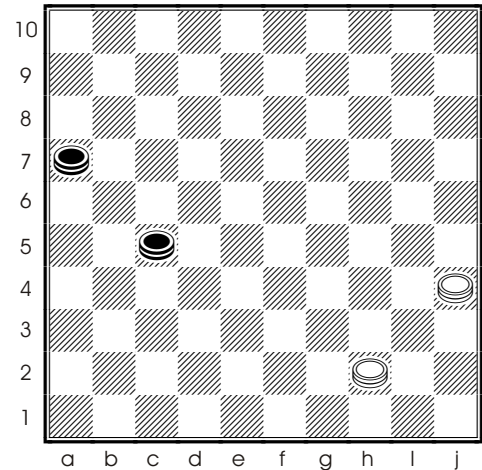
First Thoughts on Camelot Opening Play

Image from
cover
of 1931
rule book.

by Paul Yearout

O pen spaces around the initial placement of Camelot pieces raise the possibility of a flanking attack—sending a small force scurrying around the enemy. Logistics quickly discourages that notion. The defender has shorter paths to deploy impeding troops, while the erstwhile attacker, with pieces tied up in supply lines, has a reduced army to fend off the opponent's advance. So rare were such early attempts that only scores of frontal attacks remain.

Holey Wars

A cautionary tale: **1.g6g8 e11e9, 2.f6f8 e10e8, 3.d7:f9:d9 d10:d8:f6:h8, 4.i7:g9:e11 i10g12e10:e12** (This puts Black up by an exchange, though that need not be decisive.) **5.h6g7 c11e11, 6.d6e7 j11i12, 7.e6e8 h11h9, 8.g8:i10 i11:i9** (Diagram 1).
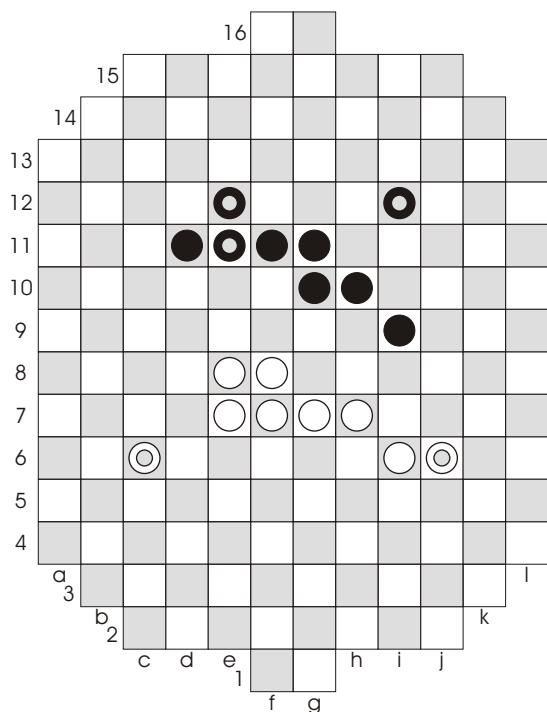
Diagram 1 – Position after 8....i11:i9

Black is tempting White with 9.j6h6h8:j10, after which 9....i12h11 yields a second exchange. **9.c6d7 i12h11, 10.j6h6?? e12e10g12i10i8:g6:g8:e6:c8.** This elicited the plaintive, "What have you done with my men?" White's oversight may be somewhat excused by Black's ninth appearing to be a defensive move in an early try at the game. The caution is that squares adjacent to pieces of both sides, such as f9, g9, h8 or i8, demand careful scrutiny.

[Notational aside: Traditionally, a number was printed on each individual square for record-keeping purposes—the algebraic system used in these articles was only recently adopted officially by the World Camelot Federation. The 1930 rules state that the board numbering has no significance other than record-keeping. Despite that, it can be otherwise used. *Parity* refers to the evenness or oddness of an integer. Within the central 10x12 rectangle (extending from a4 to l13) a canter or jump maintains parity, as well as square color. Considering the position after 9....i12h11, the square i8, numbered 87 (in one orientation of the board), is not accessible to the knights at e11 or j6, they being on the wrong color, nor to the knights at d7 or h11, which, while correctly colored, are even rather than odd. So either side can focus on e12 (35), as the pertinent knight of the position. Parity considerations can eliminate the drudgery of tracing paths or it can suggest moves to construct them. Moreover, if alpha-numerics are replaced by Cartesian coordinates (i.e. a –>1, b –>2, etc.), parity applies to each coordinate individually anywhere on the board.]

After 9....i12h11 the squares f6 and g6 may be thought of as *holes* in the White forces, hazardous for White and adventitious for Black—if Black can get a knight to h8 or j8 (which are adjacent to pieces of both sides), he can make a capture.

Diagram 2 shows a game position, White having just moved 11.i7g7e9, adding a hole at i7 to the one already present at g7. Black, contrariwise, has what I call a *U-hole* (because of the shape of the surrounding pieces) at e10.
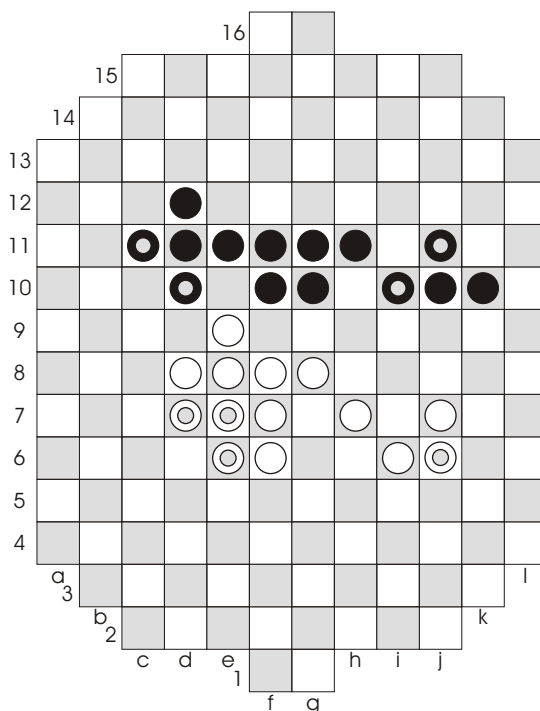

Diagram 2 – Position after 11.i7g7e9

Black may have been considering an end-run, for the game continued as follows: **11….j11k11, 12.e8e10 d11:f9:d9, 13.e6e8:c10:c12:e12:e10:c10**. Black's missed opportunity was 11….g11i11, 12.e9:g11:g9 c11e9:g7:i7:k7:i5:i7. White might try 12.e7g9:g11 in the hopes of drawing off f10, but 12....i10g12:g10 or i10i12g10:g12 allows complete devastation of the White army.

Next, in two moves Black makes three holes: **1.d6f8 h11h9, 2.i6g8 f11f9**. Although White did not take advantage of **3.e7g9 f10:h8, 4.f8:f10:h12:j10:j12 h8:f8, 5.f7:f9:h11:j9**, Black only lasted a dozen moves anyway.

Forceful Dealings

The last game also illustrates the power of forcing an opponent's captures, which sometimes results in a free move as well. To follow that line of thought, look at the following game: **1.c6e8 e11e9, 2.f6f8 h11f9, 3.h6h8 c11e11, 4.g6g8 j11h11, 5.j6j7 f10d8!** (Diagram 3).
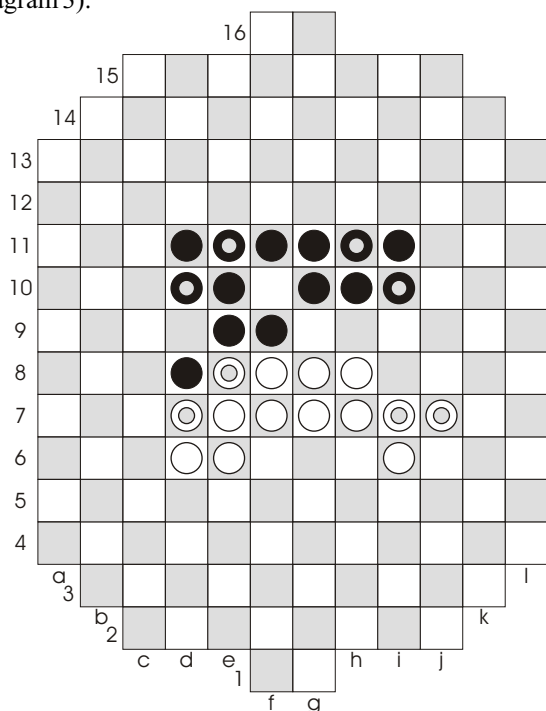
Digram 3 – Position after 5....f10d8!

The man at f8 cannot take advantage of the hole left at f10 without leaving behind a more deadly vacancy. **6.e8:c8 e11c9:c7:e5, 7.d7f5:d5 d11d9, 8.f8:f10:d8 d9:d7:f5** (Diagram 4, opposite).

A certain ambivalence goes with the man at f5. Materially, the forces are even, with relief of some initial tensions. Positionally, f5 has the potential for disrupting White later in te game. That menace can be reduced by threatening f5, say with d5d6. Actually, f5 falls to h8h6, nullifying the cleverness of Black's fifth move. However, White gave Black a ruinous gift: **9.g7f6?? e10e9, 10.f6:f4 i10g12e10e8:g6:i8:k6**, leaving d10 and h11 poised for further devastation.

Looking back to Diagram 2, rather than ending White's thirteenth move with …e10:c10, …e10:g12 h11:f13, 14.e7g9:e11:c9 increases White's advantage with a forcing move.

Finally, an opening using forced captures, with changes of fortune, and missed opportunities. **1. f6f8 g10h9, 2.e6c8? h9h8** (Why not 2....i10g8:e6:e8:g8?) **3.g7:i9** (Why not 3.c6e8g8:i8?) **3....c11e9:g7:i5:k7, 4.i9h8 f11d9, 5.c8d8** (Why not 5.c6e8:c10:e12?) **5....h11h9?** (Diagram 5, opposite). **6.f7g7** (Why not 6.c6e6g8i8:g10:g12? Black dare not capture g12 because of

the Knight's Charge from i7. Incautiously retreating 6....h10h11 gives White the free move 7.f7f8 for a different charge from i7.) **6....k7l6, 7.e7c9** (Still, why not 7.c6e8:c10:e12? Least damaging is 7....d10f12:d12, leaving d7 two ways to capture three pieces.) **7....d10:b8, 8.d8:d10:f12 j11h11f11:f13, 9.i7g9:e11:e9 b8a7, 10.e9e10 d11:f9, 11.c6e8:g10:g12:e14 l6k5, 12.d6d8 k5j4, 13.d7d9 h9g9, 14.h8:f10 i10g10:e10:c8:e8**, and Black took twenty-six more moves to win.
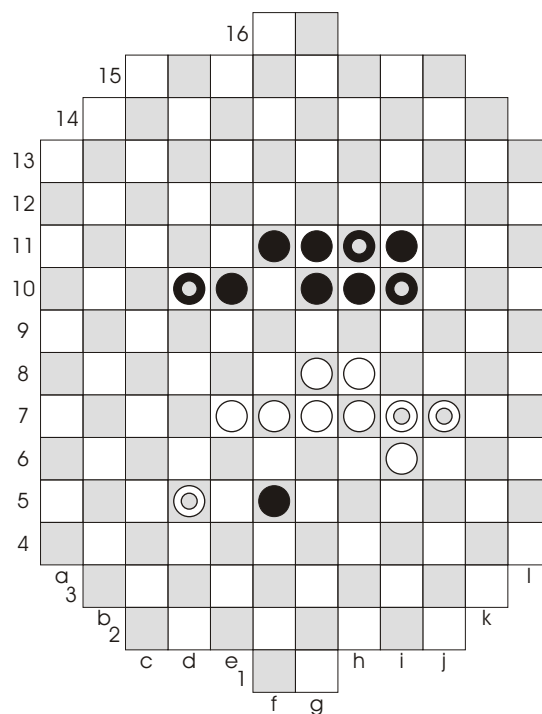

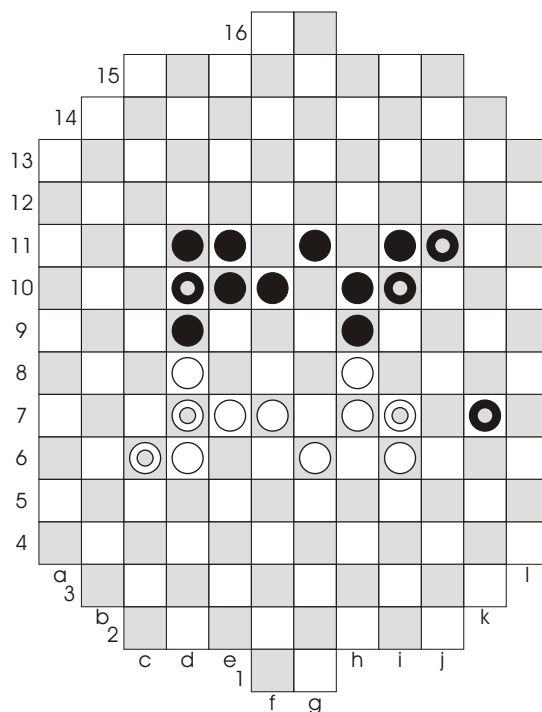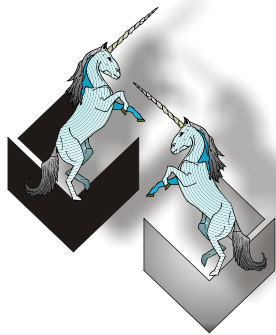*Diagram 4 – Position after 8....d9:d7:f5*

Diagram 5 – Position after 5....h11h9?

The History of 3D Chess

Part One: Raumschach and the Unicorn

by L. Lynn Smith

Recording the history of classical games can be a very arduous task. Rarely are there clear records which assign credit to specific individuals. Some classical games have mythical or legendary origins. Sometimes historians have made unsubstantiated conclusions based upon mere hearsay, hints, and rumors. At other times false claimants have 'muddied the water' by propagating misleading information. With this in mind I have tackled the question, "When was the first three-dimensional chess game proposed, and by whom?"

The history of chess itself stretches back millennia. We will not dwell upon the myriad tales of the origins of chess itself. Needless to say, various forms of chess have been played all over the world and in many different forms. So when did the first person look at that flat playing field and decide that it just wasn't complicated enough?

1771

Alexandre Theophile Vandermonde was a man ahead of his time when he extended the chess puzzle Knight's Tour into a 4x4x4 cubic playing field. Traditional Knight's Tour utilizes a single chess knight to perform a series of leaps which when complete will have touched, only once, each cell of an 8x8 playing field. Vandermonde presented a three-dimensional (or '3D') version, thus creating the first 3D chess piece and playing field on record.

Level 1				Level 2				Level 3				Level 4			
63	12	25	34	26	41	54	13	5	62	33	18	42	17	4	55
28	35	64	15	59	16	29	46	38	21	8	51	7	56	43	20
39	24	11	52	6	53	40	19	27	48	61	14	60	3	32	47
10	49	36	23	37	30	1	50	58	9	22	45	31	44	57	2

Vandermonde's 3D Knight's Tour

Most 3D developers would insist that the chess knight was already a 3D piece before it was applied to the 3D playing field. A knight, by its leap, operates above, or outside, the normal space of the two-dimensional field. If we apply this reasoning to Vandermonde's knight, we may conclude that he was the first person to create a piece operating outside the three spacial dimensions!

The L-shaped move of this first 3D knight, these leaps within one of the three intersecting planes passing through its starting cell, has come to be considered classic. Most developers have utilized this pattern in 3D chess games. But the potential of the 3D leaper was not yet fully realized.

Likewise, the 4x4x4 cubic playing field, having the same number of cells as the classic two-dimensional board, was regarded by many developers to be the first choice for 3D Chess. But the restricted playing area gives little scope for long-range pieces, and it was several centuries before viable formations and rules were developed.

1851

There are numerous stories of Lionel Kieseritzky demonstrating Kubikschach (or 'Cubic Chess') to Adolf Anderssen at their London tournament. The game is described by Jean Dufresne as "...a large glass case separated into small cube-shaped boxes from which chess pieces were hanging on strings." This game was reported in the *Deutsche Schachzeitung*, and in the first issue of *Raumschach*, a periodical created by Dr. Ferdinand Maack. However, the exact playing field and the pieces and their movements is unknown. Neither is it known who developed the game, nor whether any models have survived.

1907

Dr. Ferdinand Maack, a German mathematician, began his development of Raumschach (or 'Space Chess') with the 8x8x8 playing field. There were two versions of this initial game, but each utilized the standard 32 pieces plus eight extra pawns for each player. (Starting positions are shown overleaf.) He used the alpha-numeric notation for the cells on each level and used the Greek alphabet for the levels, calling them Alpha (lowest), Beta, Gamma, Delta, Epsilon, Zeta, Eta, and Theta (highest).

Movement of all the pieces was similar to Orthodox Chess, with such movement being performed within only one of the three planes which intersect on the space occupied by a piece. In other words, only a maximum of *two* out of the three coordinates which specify position (rank, file, and level) may be changed on any given move of a piece.

The Rook's movement is essentially one dimensional in that only *one* of the three coordinates of rank, file, and level may be changed during any one move. From any cell the Rook has the ability to move to a maximum of 21 cells. For example, a Rook on (Alpha)a1 can attack (Alpha)a2, a3, a4, a5, a6, a7, a8, b1, c1, d1, e1, f1, g1, h1; (Beta)a1; (Gamma)a1; (Delta)a1; (Epsilon)a1; (Zeta)a1; (Eta)a1; (Theta)a1. The Rook moving in 3D loses its most important two-dimensional aspect, the ability to create a 'wall.' This ability often aids in the endgame of Orthodox Chess.

The Bishop on one of the central cells can attack a maximum of 39 cells. For example, a 3D Bishop on (Delta)d4 can attack 13 cells on the Delta level, but also (Alpha)a4, d1, d7, g4; (Beta)b4, d2, d6, f4; (Gamma)c4, d3, d5, e4; (Epsilon)c4, d3, d5, e4; (Zeta)b4, d2, d6, f4; (Eta)a4, d1, d7, g4; (Theta)d8, h4. The Rook, therefore, now drops in power when compared to the Bishop.

Dr. Maack gave his Knight the same 3D move capability as Vandermonde's. The Queen combines the moves of the Rook and Bishop. The King moves one space only in like manner.

How to translate the movement of the Pawn into 3D has been the source of great debate. Dr. Maack gave his Pawn the standard move and capture upon its level with the ability to move and capture to the next level only within the plane of its rank. In other words, when shifting levels to move or capture, the Pawn's rank coordinate cannot change. An initial change of two levels was

allowed, but there was no initial two-step option on the starting level, and subsequently no need for *en passant* capture. For example, a Pawn on (Alpha)d2 could either move to (Alpha)d3, (Beta)d2, or (Gamma)d2 if (Beta)d2 were vacant. That same Pawn would attack (Alpha)c3, (Alpha)e3, (Beta)c2 and (Beta)e2.
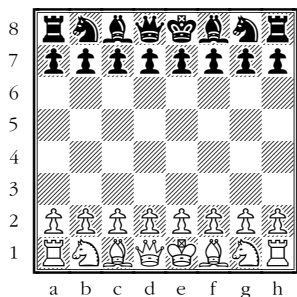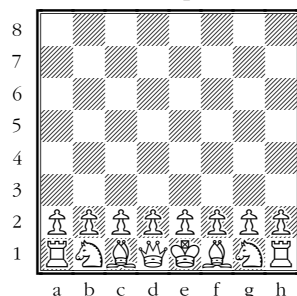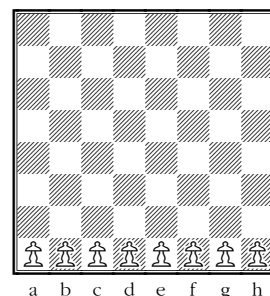
Level Alpha   **Level Beta**
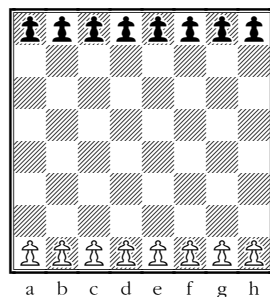
Levels Gamma to Theta begin the game empty.
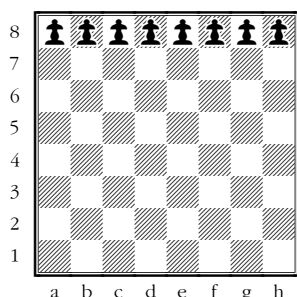
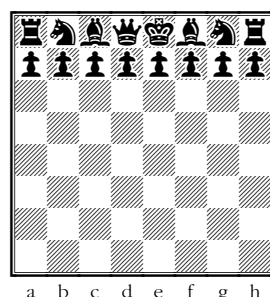*Maack's 8x8x8 Raumschach – both armies on lowest levels*

Level Alpha   **Level Beta**

Level Eta   **Level Theta**

Levels Gamma to Zeta begin the game empty.

Maack's 8x8x8 Raumschach – armies on opposite levels

In the later development, with armies starting on opposite levels, it is understood that the Pawn's level change could only be toward the opponent's starting level. But in the original game would the Pawn be allowed to change levels freely? What are the conditions for the promotion of the Pawn in either version?

Due to the daunting size of the 8x8x8 playing field and the potentially long and difficult games, Dr. Maack quickly abandoned this format. Over the next twelve years he experimented with the 7x7x7, 6x6x6 and 5x5x5 playing fields. Finally, he settled on the latter, with a game that he called 'Raumschach.' This game is considered by most enthusiasts to be classical 3D chess. It is actually quite playable. There were even Raumschach Clubs in Hamburg and London from 1919 until the start of World War II.

Raumschach utilizes the standard 32 men, plus two extra Pawns and two of a new piece for each player. This new piece, called the Unicorn, is considered to be the first true, original 3D chess piece. Where the other pieces change position by moving within one of the three planes passing through the space they occupy (i.e., by changing only two of the three coordinates on any given move), the Unicorn's movement involves a change of rank, file, and level in a single move. A shift of one space in rank, file, and level has become termed a *triagonal* move.
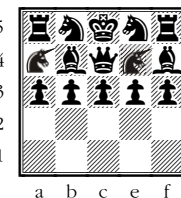
Raumschach

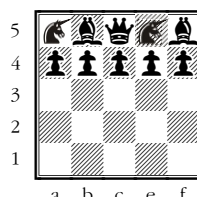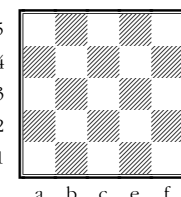Two starting positions are possible for Raumschach, as shown in the two columns below.
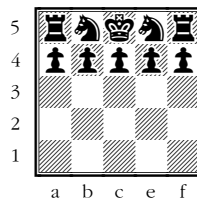
Level E   **Level E**

Level D   **Level D**
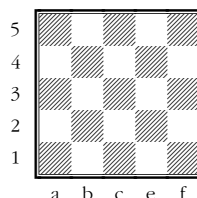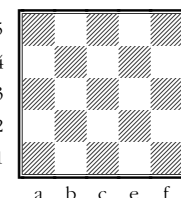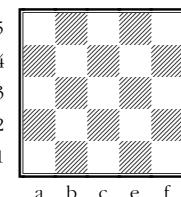
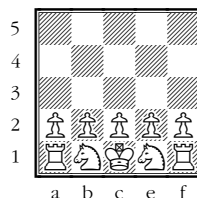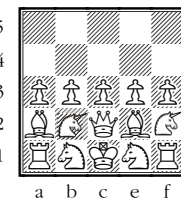**Level C**   **Level C**
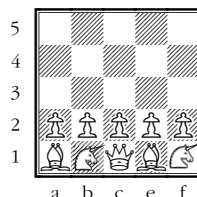
Level B   **Level B**

Level A   **Level A**

Two possible starting positions for Raumschach
(The alternative on the right uses only 5 Pawns each.)

The Rook, Bishop and Knight have their standard moves within one of the three planes intersecting at the space they start on. The Unicorn ( ) moves any number of unobstructed spaces in a straight line *triagonally* (i.e., all three of rank, file, and level change by one for each space moved). The Queen now combines the move of Rook, Bishop, and Unicorn, and the King may move one space in any direction like a Rook, Bishop or Unicorn.

The Grand Chess Corner

by Tony Gardner

It finally happened recently. Graham Allen and I have completed one of our lengthy (in terms of real time) games. It wasn't a high number of turns, nor even decisive; however, the battle did contain many instances of thrust and countering. This event will always be indelibly etched in our minds as "T99A," its original assignment number. Each of us reveled in it immensely.

T.Gardner–G.Allen, 1999-2001: **1.d5 d7, 2.c5 Bf6** (*Black immediately goes on the offensive to capitalize on the diagonal I have unwisely opened. While not crippling, this does force me to make some hard choices early.*) **3.Bd3 Nc7, 4.f4 h7, 5.Rac1** (*Graham expected 5.e5, and even offered a conditional line of 5....Bh7, but I wasn't ready to pull that punch yet. Rather, my idea was to leave the Bishop open for vulnerability. At a later point Graham expressed curiosity about my text choice—not the piece so much as where it went.*) **5....g6** (*Black keenly provides comfort to his forward Bishop and continues attacking by now focusing on d5.*) **6.Bc4 Rae10, 7.Nh4 Kd10, 8.e5 Bg7, 9.d6**
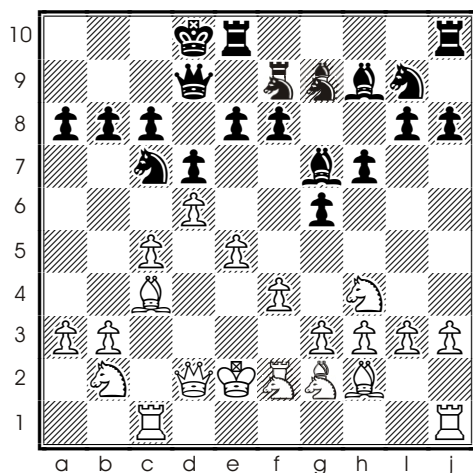

Position after 9.d6

(*Here the tactical possibilities become interesting. For example: 9....Bxc4+, 10.Nxc4 Ne6, 11.Cxa8 Nxc5!?, 12.Nb6 Nxb3, 13.Nxc8+ Qxc8, 14.Rxc8 Nxd2, 15.Rc10+ (not 15.Kxd2 Ma9), followed by 16.Rc9+, winning the Marshal for a Rook, although Black's Rooks might then become troublesome after I use the extra tempo to recapture the Knight. Another strong possibility is 15.Rjc1. As reality would have it, my adversary is astute and not easily taken in by my schemes. Instead, he bides his time and continues cautiously.*) **9....Ne6, 10.Cxa8 Qa9, 11.Cb6 Qa10** (*Black sturdily defends his c-pawn. 11....Mc9 is worthy of consideration, though I later found that Graham had designs on the f-file; his allocation of pieces is resourceful. My attempt to attack on the c-file was ironically hampered by my own c-pawn, and moving it ahead to c6 offered little promise. For inexperienced players, note that 11....Qxa3? would be disastrous for Black after 12.Ra1.*) **12.Me4 Ci7** (*Under fire on the opposite*

side, Black calmly improves his position with this excellent strategic move. The g-pawn is threatening to advance, and Bh9 is suddenly defended by two pieces, thereby unleashing Ne6.*) **13.Bxe6** (*Making this sacrifice was tough, especially knowing Black's Bishop would advance, but I felt the tempo was needed.*) **13....Bxe6, 14.Ma4 Kd9** (*Black coolly dodges yet another bullet, and here he offered 15.Mxa10 Rxa10, but I wasn't ready to relinquish control of the a-file just yet.*) **15.Qb4** (*This seemingly quiet move contains venom. The threat is 16.Mxa10 Rxa10, 17.Cc7+ bxc7, 18.Qb9+ Kd8, 19.dxc7+ and 20.Qxf9. With my three major pieces amassed together, I could almost taste the win, but it proved to be elusive indeed.*) **15....Cg8** (*Black ignores his weak b-pawn, eschews the capture of the h-pawn, intensifies the attack on b3, and defends his Marshal against the aforesaid exchange starting with 16.Mxa10.*) **16.g4** (*Which pawn do I save? 16.Rc3 Bxh3 looked hideous, so I protected the h-pawn.*) **16....Qxa4, 17.bxa4 Bd5, 18.Nd1** (*I still had visions of opening the b-file with 18.Cc7+, but it was futile; I needed reinforcements!*) **18....Bb7, 19.Nc3 f6** (*Here he comes! Still I wondered if he would test me with 19....Ba6+, 20.Nb5.*) **20.Rjd1 fxe5, 21.Nd5** (*Of course, I am aiming for the fantastic 22.Ne7+ that would destroy Black's position; therefore, he simply cannot allow it. Nonetheless, I now let him build his attack with pawns, hoping to outpace him.*) **21....Bxd5, 22.Cxd5 Cxd5, 23.Rxd5 exf4, 24.Qxb8 e6** (*At this point, I am convinced Graham has nerves of steel! I lose a Rook after 25.dxe7 e.p. Mxe7+, but beginning Queen checks now would let Black's King escape while my Rook hangs.*) **25.Rd3 e5, 26.Rc4** (*This healthy move prevents me from being completely overrun by Black's awesome pawn tandem.*) **26....e4, 27.Qb9+ Kd8, 28.Qb6+** (*Now Black's Marshal is poisonous: 28.Qxf9 e3=Q+.*) **28....Kc9, 29.Qa7+ Kd9, 30.Qa9+ Kd8, 31.Qc7+** (*I offered a draw, and Graham agreed since he cannot safely move to either the b- or e-file.*)

In the problem contest, Vincent Everaert, Jorge Gomez Arrausi, Fred Kok and Andrew B. Perkis each have a perfect score of 18 points. Other scores: David Pritchard 15, Andre Engels 13, L.Lynn Smith 11, Joseph E.E. Peterson 10, and Graham Allen 5.

Since we are well into the process, I believe it is time to etch up the difficulty level a few notches. Solvers should find these problems somewhat tougher than previous ones; however, if you disagree, let me know and I will make subsequent compositions even harder! The mate-in-5 is composed by L.Lynn Smith. Deadline for submissions is May 20, 2002.

Solutions: #7 – 1.Qb10; #8 – 1.Kc8 Nd4, 2.Rj7

(Continued overleaf.)
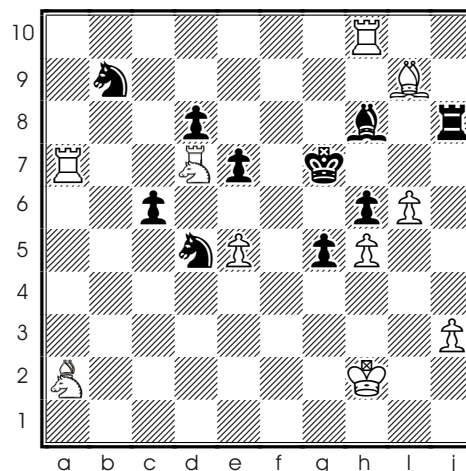
Problem 9 – White to play and mate in 2
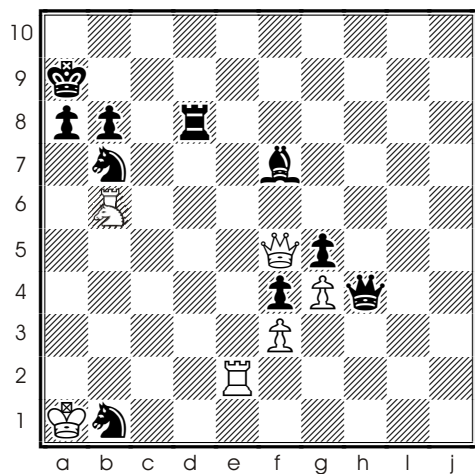
Problem 10 – White to play and mate in 5

Grand Chess extends Orthodox Chess in terms of board size, whereas Raumschach adds another dimension. A third possible extension of Chess is to a board composed of hexagons rather than squares. There have been many versions of hexagonal chess, and in *AG7* we reviewed Glinski's book First Theories of Hexagonal Chess, which describes his game in some detail. It had always been my contention that Glinski's game was the best thought out and most highly developed hexagonal chess. McCooey's hexagonal chess is very similar to Glinski's, and it, too, has its fans. *(See Tim O'Lena's letter in AG8.)* The two games are described at <u>http://www.chessvariants.com</u>. McCooey argues that his game is closer to 'real' chess. Setting aside the question of whether or not this is the best criterion for judging between the two games, we can look at the specific claims that McCooey makes.

The two games are basically identical in every respect except for the pawns: number, initial arrangement, and capture rules. David Pritchard has looked at these factors and concluded that in each case Glinski's game is actually closer to Orthodox Chess.

In the first case, the ratio of pawns to the whole army is 50% in both Glinski's game and Orthodox Chess. But McCooey's game only has seven pawns, lowering the ratio to 44%. The imbalance is exacerbated by the fact that the pieces are relatively stronger than the pawns in hexagonal chess than Orthodox Chess.

Secondly, in the initial position Mccooey's pawns are six moves away from promotion (seven in the case of pawns on the central file). In Glinski's version, as in Orthodox Chess, all pawns are five moves away from promotion.

Lastly, David had the following comments: "McCooey says that he does not understand why Glinski made his pawn captures 'straight' (they are not: they are demonstrably diagonal). It could equally be argued Glinski's pawn capture is to an adjacent cell and therefore closer to chess than McCooey's, which is not. With McCooey pawn capture from a central file, the pawn is advanced two hexes toward promotion, whereas the Glinski equivalent advances the pawn only one hex toward promotion, paralleling chess In the McCooey game a pawn other than on the central file advances two hexes toward promotion if the capture is away from the centre and one hex toward promotion if the capture is towards the centre. In Glinski's game a capture away from the centre advances the pawn one hex towards promotion but a capture towards the centre does not advance it at all. On balance, Glinski's system of pawn capture is slightly closer to that of chess."

We are still looking for someone to write about Glinski's Hexagonal Chess. Even contacts in Eastern Europe have drawn a blank! If you can suggest anyone, please let me know. – Ed.

Closing Thoughts
While not a technical game-theoretic term, *delicate* is quite descriptive of Camelot—small oversights or apparently innocuous moves can have dire results. Of nearly thirty opening scores, only two come out with equal forces, another five with numerical equality, but with fewer knights on one side, and the rest with sometimes drastically unbalanced forces.

All pieces having equal value in castling, a gain of one piece, whether man or knight, can be hoped to be a winning edge, unless position outweighs material. An old Chess adage becomes applicable: when ahead, trade. Less significant may be the chessic emphasis on the center of the board, though there is a tendency toward the center among these openings.

A few highly tentative Camelot maxims suggest themselves: fill holes quickly, as with e6e8, c6e6 or e6g8, c6e6. Another opening choice was f6f8, though never followed by j6h8f6, likely as good as e6 for positioning a knight. Directly attack the enemy with extreme caution, fearing the free move. Remember that even remotely positioned knights can travel fast. Seek early trades.

Despite Camelot's age the level of play remains primitive. Many more well-played games must be examined before more useful insight will appear. ■

The Pawn no longer has any two-step option. In addition to its standard movement and capture within its starting level, the Pawn may move directly up or down one level or may capture up or down one level diagonally within the vertical plane passing through its starting rank. In other words, when it changes level to move or capture, the Pawn's rank coordinate cannot change. The White Pawn can only change levels upward, and the Black Pawn can only change levels downward. White promotes on the fifth rank of Level E, and Black promotes on the first rank of Level A. Castling and *enpassant* are not used in Raumschach.

Dr. Maack's creativity was not restricted to three dimensions. He also added an 'extra dimension' to the 4x4x4 playing field by creating a game which was played on four of these cubes simultaneously. Maack published several booklets about his games, including *Das Schachraumspiel: Dreidimensionales Schachspiel*, *Anleitung Zum Raumschach*, *Spielregeln Zum Raumschach*, and *Einfurrung in Die Spielpraxis*.

There were other innovators, of course, in this early period. In 1918 the 8x8x8 playing field was also tackled by Russian mathematician Dr. Ervand Kogbetliantz. He increased the number of men from the standard 16 to 64 for each player. This game is believed to have been unmanageable.

In the next installment I will take the 3D chess story up to V.R. Parton and the development of Alice Chess and its relatives. ■

Sources
The Encyclopedia of Chess Variants, D.B.Pritchard (Games & Puzzles Publications).
*Exploring the Realm of Three-Dimensional Chess*, Dave Erik Matson (The Oak Hill Free Press).
Knight Tour Notes, http://homepages.stayfree.co.uk/gpj/ktn.htm.
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 uncovered much information.
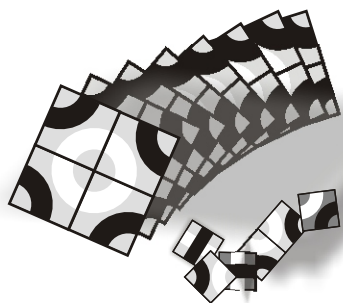
# Trax Strategy

Part 1

by David Smith

Trax was reviewed in the very first issue of this magazine. The rules are given on page 24. This is the first of several articles on the game's basic strategies which, although fundamentally different from any other abstract game, flow naturally from what one reviewer described as "the purest strategy game I have ever seen." To put this observation into context for readers unfamiliar with Trax, consider these characteristics:

● The entire equipment consists of identical square tiles, as many as are required to complete a game.

● The tiles are marked with sections of black and white track that join adjacent edges on one side and opposite edges on the other.

● Many turns consist of playing more than one tile at each turn to comply with the 'forced play rule.'

It has been possible to play Trax since man first become capable of logical thought. But only since 1980 has that happened, to our knowledge at least! An interesting feature of the game is that both players have absolutely equal chances of winning—in nearly all other games of connection or alignment some corrective mechanism is required to balance the advantage of the first move. In addition, the game is capable, in theory at least, of being played omnisciently to infinity. But twenty-one years on, a growing nucleus of top players have discovered that infinite play is an unlikely possibility, with only a handful of best-play games to date having exceeded 50 turns and around 200 tiles.

Basic Winning Structures

Here are most of the basic ways in which Trax games are won and lost. These are target structures to aim for, threats to reduce your opponent's choices. They will help you to learn how to optimize the positioning of sections of your own track and minimize the effectiveness of your opponent's track in the process.
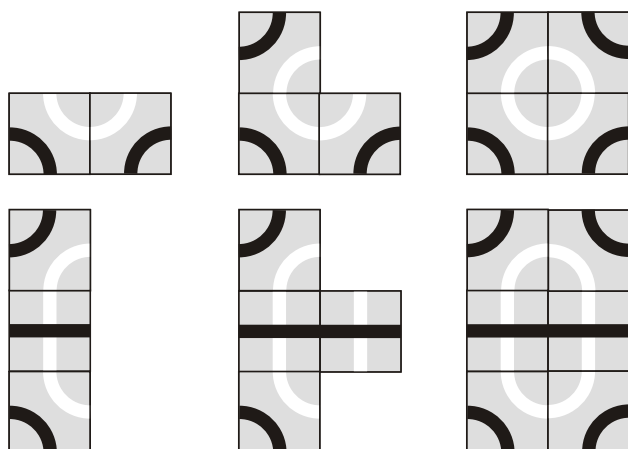

Initial position   *Position after placement of primary tile*   *Final position after forced plays*

Narrow attack (top) and wide attack (bottom)

Double Loop Threats

The simplest of all loop threats is called an "L"—so named because the immediate tiles are in the form of a capital L. This position threatens to win for White next turn. It has that capability because of the two white corners at each tip. If it is undefended, or undefendable because of another more immediate threat elsewhere, White plays as follows:
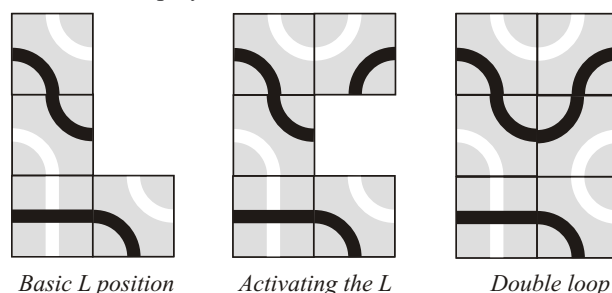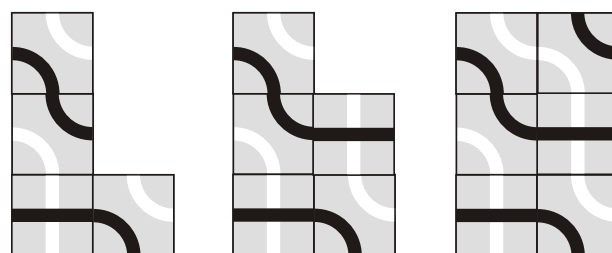

Basic L position   *Activating the L*   *Double loop*

The L Double Loop Threat

Once White gets the double-loup position, black cannot defend both simultaneously. If, on the other hand, it is Black's turn, Black can play his next tile as shown below and join the two corners to each other, again with the help of one forced play, thus killing the L threat.


Black can kill the L threat

Other defenses include killing either corner. The best defense will often be determined by the state of the position beyond the tiles forming the L threat. Many similar structures can be formed, as we shall see in the course of these articles. Also, one turn prior to forming a double loop or L threat, there may be opportunities to create L's while attacking elsewhere. Here are some examples of that. In the examples just the initial position will be given and then the position after placement of the primary tile and forcing plays. The primary tile will have a darker shade.

Firstly, the following position shows the Short L Threat. White activates the Short L, as before, to create those two half circles again and win. (Note that without the tile at the top left of the diagram, Black would have an immediate win himself.)
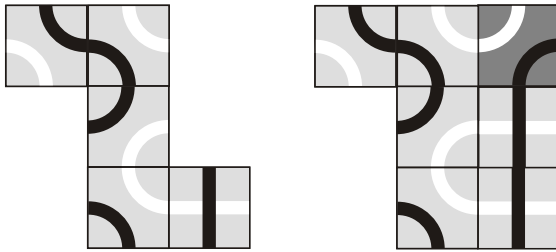
Short L Threat

The next example is an Edge Threat. In this formation White has two corners at each end of it, with black track in between. By making a single loop attack off either end, again away from the other corner, White forms the L we saw above. Black defends the initial attack and loses two turns later to the White L threat that he had no opportunity of defending.
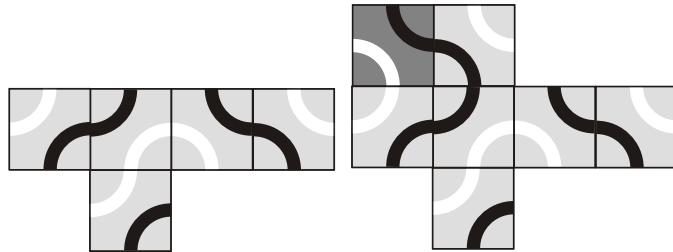
Edge Threat

Finally, we look at a position where White can form two loops in a different way. White strategically places a "straights upward" tile between two potential loop attacks or corners. This creates two loop attacks using the forced plays to do so. One of those attacks is the Wide Attack, shown above.
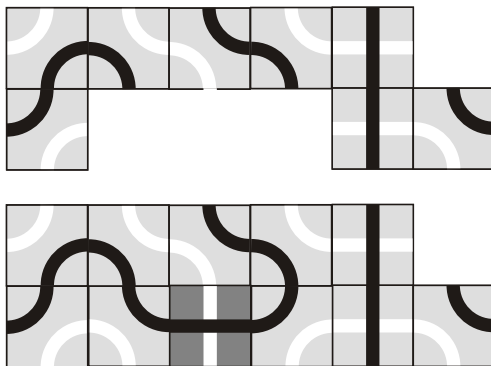
Another Double Loop Attack

From these beginnings, players learn that larger and larger formations can become part of double loop attacks. Not only that, but stronger players can suddenly see the potential for double attacks earlier and earlier, sometimes even 11 attacking turns ahead.

Single Loop Threats
A more subtle winning strategy involves making single loop attacks into confined areas of the position, referred to as *caves*. In the three examples below White is threatening to make the move shown. After this move Black is defenseless since any move he tries will merely give White a loop to close in the next turn. Try it and see—the third example is particularly surprising!
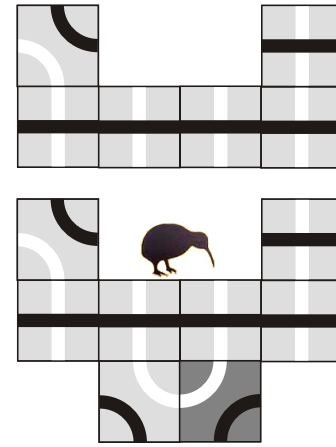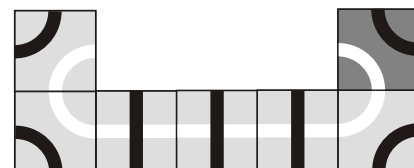

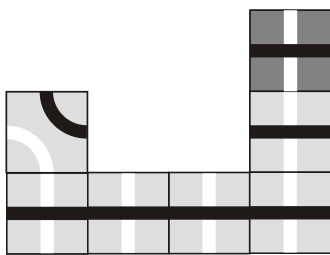*Single Loop Threat 1*

Single Loop Threat 2

Single Loop Threat 3

The cave does not have to exist before the attack. In the next example making the attack towards the hollow also creates the cave that makes it indefensible!
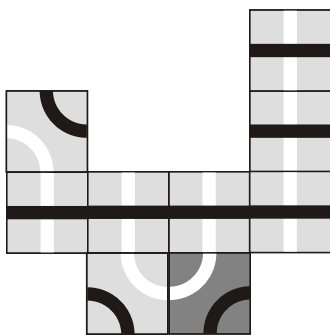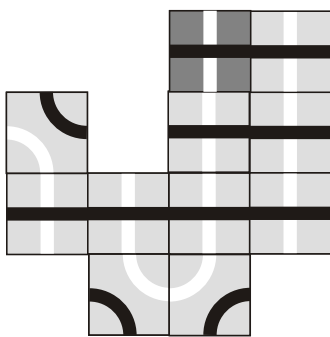

Creating a cave to attack

Ways of defending against cave threats include the following.

Black deepens the cave to allow for defense

White attacks into the cave

Black defends

The above examples are just a handful of the many ways in which double loop threats and undefendable single loop threats can be created by skillful Trax players. In the next article we will take a look at line threats and Trax openings. ■

The author of this article, New Zealander David Smith, invented Trax in 1980. The game was first published in New Zealand and the USA in 1981. World Real Time and E-mail Championships have been held since 1985 and have been dominated by Dr. Donald Bailey of New Zealand. Other top players include Dan Pless (USA), Carole Plante (Canada), Carl Johan Ragnarsson (Sweden), and David Smith himself.

Trax may be played via e-mail through Richard's Server (http://www.gamerz.net/pbmserv/), or real-time play is possible online at the Microsoft Gaming Zone (http://zone.msn.com/trax/default.asp?hb=f). While Trax may be played with graph paper and colored pens, the manufactured equipment is pleasant to handle and relatively inexpensive. Trax sets may be purchased online at http://www.traxgame.com/ or by writing to David Smith at 18 Roscrea Place, Mandeville, RD 2, Kaiapoi, NewZealand.

Trax is perhaps the most unusual and original abstract game to have achieved a modicum of success in recent times. It is my guess that Trax will be one of the handful of games from the 20th Century that will still be played in the 22nd Century. – Ed.

77 ...a game by Larry Back

77 is a game for two or more players. The board consists of seven numbered columns, and three spaces to mark 'outs.' There is a board for play on the back cover of this magazine. Also needed are three white tokens, eight black tokens, a pair of dice and a marker to keep track of outs. As well, a pencil and some paper to record each player's score is required. (In place of white and black tokens different coins or other markers can be used.) Players decide the order of their turns in any way they choose. Turns will be taken in this order throughout the game.

Winning: Once one player attains a total score of 77 or more points the game continues, but from that point on a player is eliminated if he finishes his turn with fewer total points than the leading player. The last player remaining in the game wins. In other words, as soon as one player reaches 77 total points, each player must finish his turn with at least a tie for the lead in order to stay in the game.

Opening setup: At the beginning of a turn the board is always set up as in the diagram below. The particular arrangement of pieces within a column is always irrelevant. Note that the outs marker is set to zero.
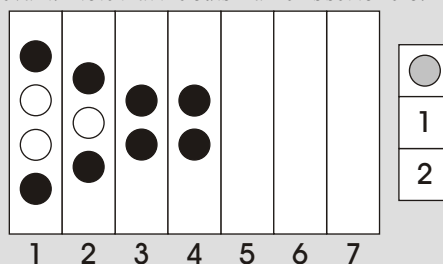
Turns: A turn consists of making one or more moves. A player's turn is over when he records three or more outs or when he decides to stop his turn and add his points earned during that turn to his total score. A player earns zero points for a turn if three or more outs are recorded.

Moves: A move consists of rolling a pair of dice and then either moving one or two tokens or recording one or two outs. If the number rolled on a die corresponds to a column occupied by one or more tokens, then one of those tokens must be advanced into the next higher column. A player can always choose to advance either a black or white token, if such a choice is available.

If two different numbers are rolled, then a token must be advanced from each corresponding column that is occupied. If neither corresponding column is occupied, then *one* out is recorded. If the column corresponding to the lower number is occupied, then a token from that column must be advanced first. If that token then occupies the column corresponding to the higher number, then either it is advanced again or another token from that column is advanced.

If a player rolls doubles, then two tokens must be advanced from the corresponding column, if possible. If there is only one token occupying the column, then only one token is advanced. If no tokens occupy the column, then *two* outs are recorded.

Scoring: If a column contains at least two white tokens, then the total number of tokens (both black and white) in that column is multiplied by the column number. The result gives the player's score for that turn if he decides to stop at that point. For example, if a player has two white tokens and one black token in the 6 column, then, with a total of three tokens in the 6 column, the player would add 18 (3 x 6) points to his score if he were to stop at that point. If no column contains at least two white tokens, then a player has zero points for that turn. Therefore, there is no reason for a player to stop his turn in that situation. (Maximum score in one turn is 77.)

First turns: In order to ensure that each player has an equal chance of winning, a player's first turn score is reduced by multiplying it by O/N, where N is the number of players and O is the order in which a player takes his turn. Remainders are rounded up. For example, with two players, the first player multiplies his first turn score by 1/2. With three players, the first player multiplies his first turn score by 1/3, and the second player multiplies his first turn score by 2/3. The last player always records his full score. ■

Rules of Trax

Trax is played with a collection of identical square tiles. Each tile is marked on one side with curved black and white paths and on the other side with straight black and white paths, as shown below.
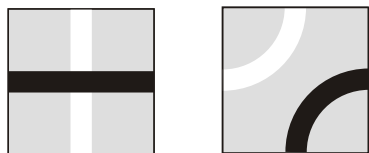
Trax is played by two players, White and Black. The players take turns to place a tiles on the playing area, either side face up. After the first play subsequent tiles must connect edge-to-edge with one or more tiles already played. At the edges where the new tile played connects with tiles already played the colors of the paths, or *tracks*, that are joined must match.

Valid join   *Invalid join*

When a player plays a tile that creates a space entered by tracks of the same color from two different directions, he must continue in the same turn by filling this space with a tile appropriately. All such spaces must be filled before the turn is completed. The initial tile placed is called the *primary tile*, which may lead to one or more *forced plays*. Forced plays may, of course, lead to other forced plays.
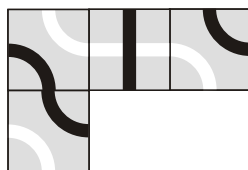
Initial position   *Position after play of primary tile*

Position after forced plays

A situation may result after forced plays when three or four tracks of the same color are entering a space, and the space cannot therefore be filled with a tile in any orientation. In such cases the primary tile played in the move and all the forced plays must be retracted and an alternate move attempted.

The winner is the player whose track first forms a *loop* or a *line*. A loop is any closed path, of any shape. A line is a path that joins opposite and outermost edges of the tiles in play over at least eight rows of tiles, across or down. It is possible for a player to win as a result of tiles placed by his opponent. However, if winning formations of both colors are completed in the same turn, the player whose turn it was is the winner.
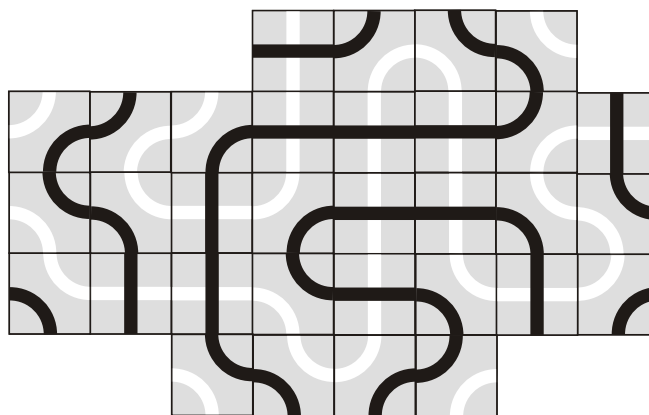
Readers not in possession of Trax sets may follow positions in these articles using the free Trax Player Program downloadable from http://traxgame.com. A robot program, Doby III, and strategy books, and Trax sets are available at the same site.
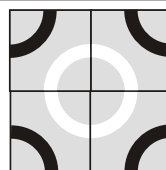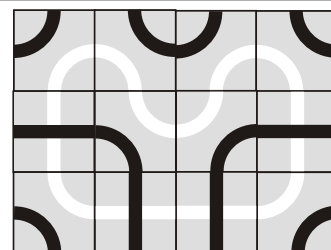
Simple loop   *Larger loop*

Side-to-side White line

It might seem that with good play it would be possible to continue a game indefinitely, with neither player able to force a win. This is not the case. While Trax may theoretically be drawn in this way, in practice it never happens. The average Trax game lasts about 24 turns and uses about 60 tiles. The standard Trax set (chosen because the layout was originally restricted to 8x8) consists of 64 tiles, which is sufficient for about 64% of all games; two sets of 64 tiles would be enough to complete all but a handful of the thousands of recorded games played to date.

Notation

For recording games a descriptive notation is used. If the players imagine that the layout of a Trax game so far is fitted into the smallest possible rectangle, then the space at the top left of this rectangle is A1. The columns are labeled A, B, C, etc. from left to right, and the rows are labeled 1, 2, 3, etc. from top to bottom. In this way, any space can be identified with a letter and number.

Because a tile may be played to the left of the existing layout, the column immediately to the left of the A-column is designated '@.' Likewise, the row immediately above the 1-row is designated '0.' Whenever a tile is played into the @-column, the labeling of all the columns will shift afterwards so that this new leftmost tile is in the A-column. Likewise, a tile played in the 0-row will shift the labeling of all the rows so that this new topmost tile is now in the 1-row.

The third symbol in the recording of a move specifies the orientation of the tile played at the location determined by the first two symbols. A '+' is used for a tile played with the side with straight paths face up. The symbol '/' or '\' is used for a tile with curved paths face up, with the direction of the slope corresponding to the direction of the curves on the tile. The first tile must be placed in one of the two orientations at the top left of this page, then these directions will be unambiguous.

The first tile played will either be @0/ or @0+. It is unnecessary to record forced plays. – KH

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Hex Strategy

Part 6: Opening Theory

by Cameron Browne

In *AG8* we looked at computer Hex players and introduced a simple algorithm that plays a surprisingly strong game given its lack of strategic knowledge. This issue we consider opening play, an aspect of Hex that defines the nature of each game and often determines who wins and loses within the first few moves.

Opening Play

The first few moves of a game of Hex establish the connective framework upon which the rest of the game is based, and any mistake at this early stage is especially critical. The opening player has a huge (winning) advantage if allowed an unconstrained first move: this is true both in theory and in practice.

The strongest opening move, as a rule, is at the board's center (F6 on the 11x11 board). From this key point the opening player threatens direct connection to both of his edges and neatly splits the opponent's defense. The value of the center is further highlighted by the fact that this is the weakest link in both players' best spanning paths. An exception to this rule is the computer Hex player described last issue, which had particular opening requirements.

To delve into opening strategies, we will examine the 10x10 board. This board is easier to analyze while still allowing complex play to develop, and has been the focus of considerable scrutiny at PlaySite (http://www.playsite.com), where 10x10 is the standard board size, leading to some interesting recent developments in opening theory. Thanks to regular players John Tromp, Kevin Walker, and Bill Leboeuf for discussions on these topics.

The first thing to notice about the 10x10 board is that there exists a pair of equally central points rather than a single point. Apart from this the 10x10 and 11x11 boards are strategically similar and can be described as belonging to the same *strategic pair*. This means that 10x10 and 11x11 have more in common strategically with each other than they do with any other sizes.
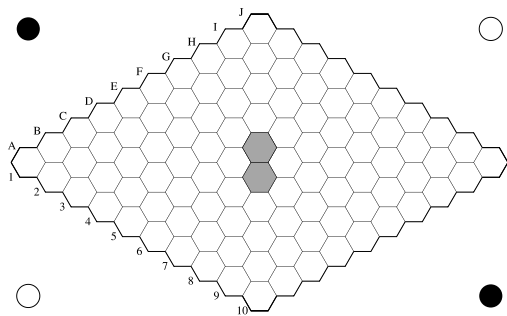

Figure 1 – Middle pair on 10x10

The reason for this pairing lies in the fact that *the distance from each edge to the furthest central point is the same for both boards.* A general rule of thumb is that any even-sided *nxn* board is strategically similar to the $(n+1)$x$(n+1)$ board. Having said that, it should be borne in mind that the boards within each pair are not strategically *identical* and that subtle differences in play may suit one more than the other. The even board of each pair, being smaller, will obviously be more sensitive to edge-based strategy and provide more limited scope for play.

To Swap Or Not To Swap

The *swap option* can be used to neutralize the huge first move advantage as follows: *assuming Black starts, White has the choice on his second move of either continuing to play or swapping colors, effectively stealing the opening move.*

The swap option (also called the *pie rule*) brings a fine balance to opening strategy. Black must select a move that is weak enough to defend against, yet strong enough to mount an attack. The swap option is the simplest and most elegant of the several methods suggested for first move equalization, and actually adds a dimension of strategy to the game, as the doubling cube does for backgammon. An added bonus is that it tends to force players to begin within well-defined regions of the board, facilitating the analysis of opening lines of play.

Ian Stewart, in his otherwise excellent *Scientific American* article on Hex [Stewart 2000], written nearly half a century after Martin Gardner's famous article in the same column [Gardner 1959], erroneously states that the swap involves exchanging the color of the first *piece* rather than the *players* themselves swapping colors. This distinction is subtle but important—swapping the piece's color requires that it be moved to a reflected position across the board to maintain its relationship with the opening player's edge.

So in what cases should the second player elect to swap? Figure 2 shows Kevin Walker's swap scheme for the 10x10 board, where: shaded cells represent losing openings that should not be swapped, blank cells represent winning openings that should be swapped, and cells marked *?* are borderline cases with uncertain results.
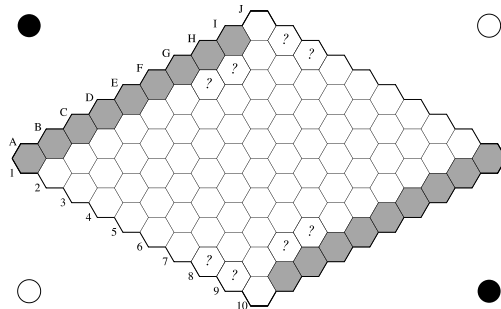

Figure 2 – Kevin Walker's swap scheme for 10x10

This scheme is clearly defined except for the few borderline cases,

and may be extrapolated to the 11x11 board, as shown in Figure 3. This plan for the 11x11 board is a combination of Kevin's 10x10 scheme and the more pessimistic swap ranking scheme described in *Hex Strategy: Making the Right Connections*.
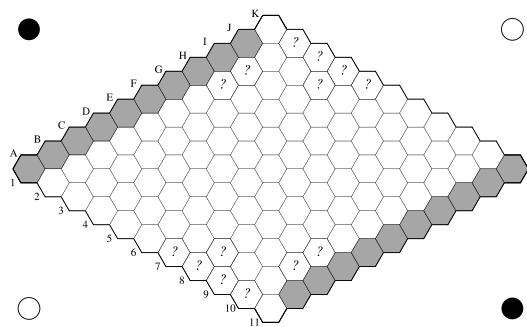

Figure 3 – Modified swap scheme for 11x11

The swap value of opening moves becomes more uncertain with increasing board size, and the first player can generally get away with more aggressive opening moves on larger boards.

First Move

Given the threat of swap, the best opening moves on 10x10 are A2 and J1 and their rotational counterparts. The equivalent opening moves in the 11x11 board are A2 and K1. *The first player should strive to make the strongest possible opening that will not be swapped.*
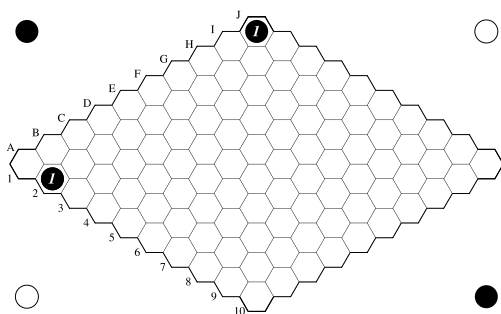
Figure 4 – Sensible opening moves A2 and J1

A2 in particular is deceptively strong as it provides Black an escape for 3-row ladders, making his connection to the top left edge relatively easy to achieve, while at the same time encroaching into space that may be required for White's connection to the bottom left edge later in the game.

The slightly less useful J1 is a good opening against an experienced opponent who will recognize the value of A2 and probably swap it. J1 provides a ladder escape for 2-row ladders and lies on the strong short diagonal, possibly interfering with future White connections that may develop to the top right edge.

Assuming that the first move is A2, and the swap has been either taken or declined, it is generally wise to play the second move at a central point as far from A2 as practical. On the 10x10 board this means moving at E6 (F6 on the 11x11 board).

The following sections examine some basic opening sequences that often develop from this situation. Note that since the players swap colors rather than the piece itself, it is not relevant whether or not the swap was taken in the following diagrams.

> *"Chess is a sea in which a gnat may drink and an elephant may bathe."* – Hindu proverb

Opening 1: Classic Defensive

The *classic defensive* opening is, as its name suggests, a standard defense against central move **2,** as shown in Figure 5. Until recently this was the most commonly used opening sequence.
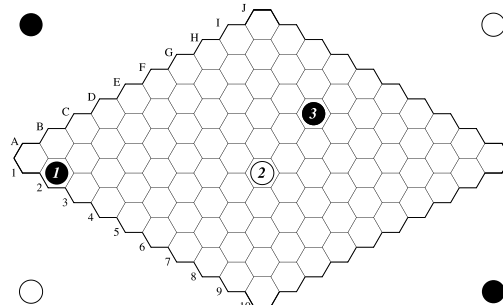

Figure 5 – Classic defensive opening

However, it has been shown to be a weak opening on 10x10 and can be defeated by **4** G7. Defensive variations on move **3** on the left side of the board (the same side as opening move **1** A2) are also weak.
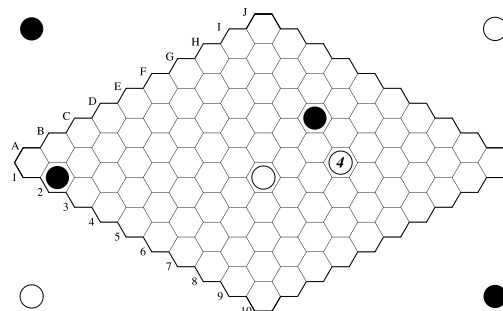

*Figure 6 – Move **4** G7 defeats this opening on 10x10*

As board size increases and central move **2** lies further from the edge, the classic defensive opening becomes increasingly useful.

Opening 2: Bridge Gambit

The strongest known third move play on 10x10 is **3** G6, as illustrated in Figure 7. This recent development in opening theory, which only came to light this year, is very aggressive—but it pays off!
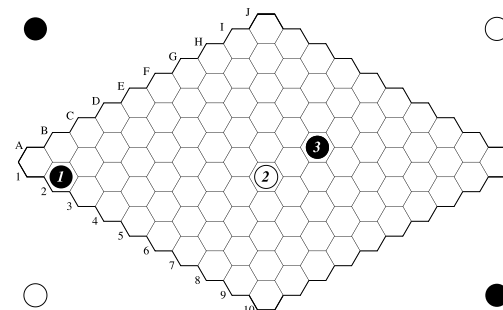

Figure 7 – Bridge gambit opening

We call this play the *bridge gambit* because it invites White to form a bridge towards his top right edge with **4** G5 as shown in Figure 8. Black can now play **5** at F6, I4, or C6 to put himself in a very strong (winning) position.
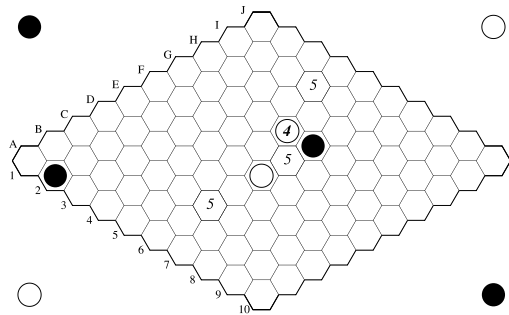
Figure 8 – White takes the offered bridge but is vulnerable to Black's reply 5

Let us consider how this game might progress against an inexperienced player who takes **4** G5. If Black intrudes into White's bridge with **5** F6, then White is more or less forced to play **6** F5. Black now has a solid two-piece block at F6 and G6 that threatens connection to his bottom right edge. Black's next move **7** I4 is well placed to connect to the lower right edge either directly or through this central two piece block, and also threatens to connect to the top left edge using A2 as a ladder escape.

The only reply that will impede Black's connection to the top left edge is **8** I3. Black then *pinches* White towards this edge with the 4-row ladder **9** H4, **11** G4, **13** F4, shown in Figure 9. This pinch is more effective on smaller boards where the central moves **3**, **4** and **5** are closer to the edge.
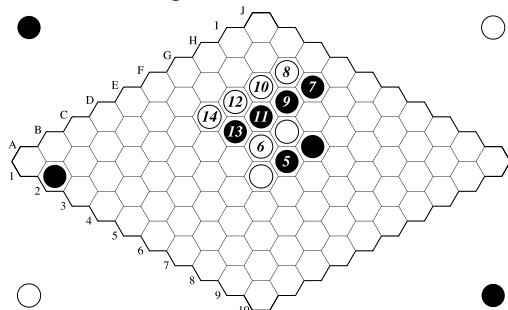
Figure 9 – How play may develop after bridge intrusion 5 F6

Black now jumps ahead of the bridge with **15** D4 and **17** D5. These moves are safely connected to the top left edge with the help of A2, so White is forced to play **16** E4 and **17** E5 to keep this connection isolated from Black's advancing 4-row ladder.
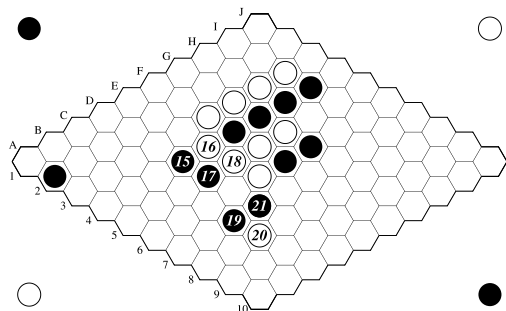
Figure 10 – Black easily forces a winning position

Black's forcing moves **19** C7 and **21** D7 then put him in an unbeatable position. Readers may wish to verify for themselves that White cannot defeat the position shown in Figure 10.

So does the bridge gambit provide a guaranteed win for Black from the third move? White may try a more creative defense such as **8** E7 (Figure 11), which attempts to neutralize the

danger of the central two piece block, but Black's **9** H7 again puts him in a winning position.
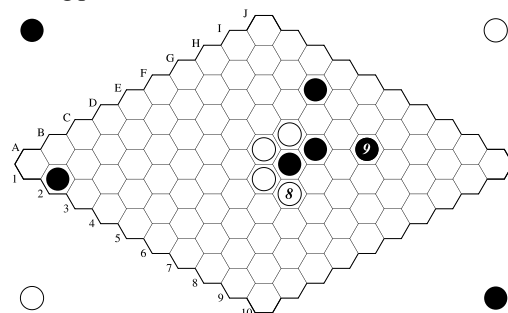

Figure 11 Black's 9 H7 answers the apparently dangerous 8 E7

Kevin Walker points out that White is better off not taking the offered bridge **4** G5, and instead should make the fourth move at one of F4, F7, G3, G4, or G5.

No successful defense against the 10x10 bridge gambit is currently known. To put these two most common opening plays into perspective, Bill Leboeuf describes the classic defensive opening as the "strongest losing line" and the bridge gambit as the "weakest winning line" on the 10x10 board.

Some analysis reveals that the bridge gambit is also a very strong opening on the 11x11 board. However, as board size increases, the less pronounced the upper board pinch against the impending top left edge that can be imposed by Black. This means that White has more space to maneuver around the dangerous central block (as indicated in Figure 12), making the bridge gambit less effective. In fact, it may be quite a risky opening for boards larger than 14x14, where the classic defensive play may be better.
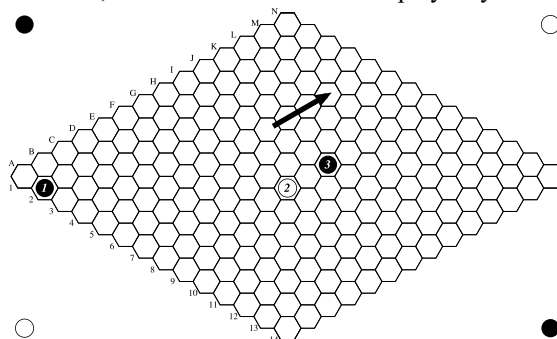

Figure 12 – The bridge gambit pinch on a larger board

Opening 3: Springboard

Another opening sequence worth mentioning briefly is the *springboard opening,* as shown in Figure 13. This play is named after John Tromp's description of it as "attach, run along and jump"—the fact that the Olympics were on in town while this was being written may also have something to do with it.
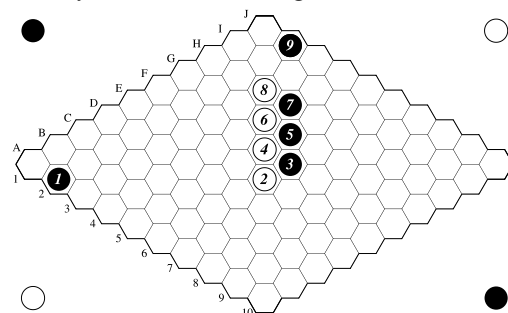

Figure 13 – Springboard opening

Black squeezes White towards the top edge then forces a ladder, which is nicely protected by the shadow of Black's solid line *3* F6, *5* G5 and *7* H4. This opening sequence leads to situations such as that shown in Puzzle I in *AG8*.

Opening 4: Short Diagonal Reflection

Black's third move *3* C8 shown in Figure 14 specifically defends against an opening in the top obtuse corner. It threatens to connect to the top left using piece *1* as a ladder escape (as indicated) in addition to providing a ladder escape to a potential connection from *1* (also indicated). This circular dependency makes economic use of available pieces, a good Hex strategy.
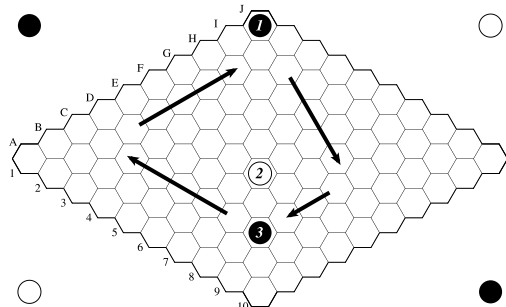
Figure 14 – Short diagonal reflection 3 threatens both a connection and a ladder escape

Kevin Walker points out that this opening play highlights the strength of the short diagonal. A drawback of the short diagonal reflection is that it may be overly defensive and hands the initiative to White. This opening may be suitable for board sizes up to 14x14 but becomes questionable above this range.

Conclusion

Following a strong borderline opening such as *1* A2, Black is almost guaranteed success on the 10x10 board if he follows the bridge gambit opening. It has not been proven that this opening is invincible; however, it definitely puts Black in a superior position with well-defined extensions of play and no successful defense is currently known.

The bridge gambit also appears to be the strongest opening play on 11x11, but becomes less effective for larger boards greater than 14x14 where the classic defensive opening may be safer. For even larger board sizes than this (e.g. 19x19), even the classic defensive play may be too close to the central piece *2.*

That wraps it up for this series on Hex strategy. Readers wishing to pursue the game further may be interested in Jack van Rijswijck's recently completed Masters Thesis, available for download from http:\\www.cs.ualberta.ca\~javhar, which gives a good overview of Hex and discusses computational aspects of the game, including his program Queenbee, in detail. ∎

Solution to Puzzle from *AG8*
Solution J: J12.

White's position looks reasonably solid; however, path analysis reveals that White's best spanning path contains a vulnerable point of overlap at J12, and two bridges that can be exploited directly at {F12, F13} and {K13, L12}—shaded in the first figure.

Black's *1* J12 safely connects that piece and its neighbor I11 to the bottom right edge: if White attempts to block either avenue of connection, Black can play forcing move F13 or K13 to connect through the other avenue.
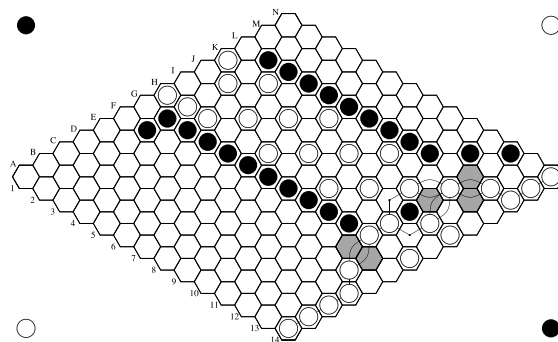
White is forced to reply *2* K11, then Black's *3* I11 sets up a sequence of forcing moves that ricochet between the solid walls of Black pieces along columns G and L until the top right edge is reached, as indicated in the second figure.
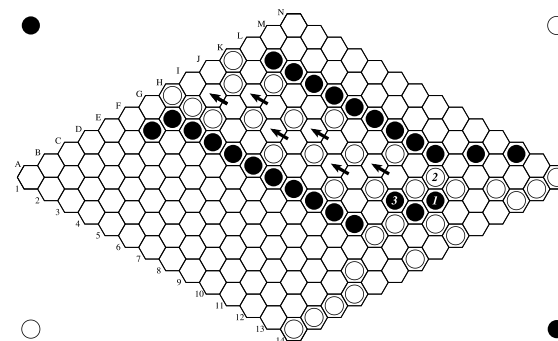
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Browne, C. (2000) *Hex Strategy: Making the Right Connections*, AK Peters, Massachusetts.

Gardner, M. (1959) "The Game of Hex," *Mathematical Puzzles and Diversions*, Penguin, Hammondsworth, 70-77.

Stewart, I. (2000) "Hex Marks the Spot," *Scientific American,* September, 283:3, 82-3.

Van Rijswijck, J. (2000) "Computer Hex: Are Bees Better Than Fruitflies?" *Masters Thesis*, University of Alberta, http:\\www.cs.ualberta.ca\~javhar.

Dameo and Frisian Checkers Problem Solutions
Trapdoor: 1.d2f4 h3:f3:d3 *(The choice is irrelevant.)* 2.a1b2 f5:f3, 3.c4d5 d6:d4 *(The choice is irrelevant.)* 4.b1b3 a3:c3, 5.c2:c4:e4:e6:g6 *(The trapdoor opens.)* 5....a2:c2, 6.c1:c3:e3:g3 h4h3, 7.g3h4 h3:h5, 8.g6g7

Heelkick: 1.c6d7 e5:c5:a5:a3:c3:c5, 2.e2e4 d8:d6, 3.h2g3 g4:g2:e2, 4.e4:g4:g6:e6:c6:c4 *(Coming around to cover the heel at c4.)* 4.... e2:e4, 5.d4:f4:f6:f8:d8:b8+ a8:c8

Coup Raphael: 1.f3e4 e5:e3, 2.c3e5 f5:d5:d3, 3.b5b6 b7:b5:d5, 4.e1d2 c7:c5:c3 5.d2:d4:d6:d8+ c8:e8, 6.b3:d3:f3:f5:f7:d7

Ladder: 1.g2g5 a3:c3:c1+, 2.g5f6 f7:f5, 3.g4g5 g6:g4:g2, 4.f2d4 *(A ladder at the core that cannot be broken down.)* 4....d5:d3:f3, 5.h2:f2:f4:f6:d6:d8+ e5:e3:e1+, 6.d8:g8:g1:d1:a1:a8

Frisian Checkers Solution
1.h2a9 a7d10 *(1....a7b6, 2.j4g1 wins)* 2.a9b10 d10a7, 3.j4h2 c5g1 *(3....c5e3, 4.h2a9 wins)* 4.h2e5 g1f2 *(4....g1j4, 5.e5b8 wins or 4....a7f2, 5.e5i1 wins)* 5.b10j2 f2i5 *(5....f2e1, 6.e5a1 wins or 5....f2b6, 6.e5a9 wins)* 6.e5i1 i5e9 *(6....i5d10, 7.i1a9!)* 7.i1a9. *White captures a king and will win the remaining endgame.*

Speaking in Tongues

by Connie Handscomb

I reach quickly for the shopping list under the magnet on the refrigerator door. What's this? "DWD". "*DWD*"? I can see this cryptic note is going to be a *big* help to me! I recall I had asked my beloved to add some items to this list on one of his (infrequent) visits to the kitchen. I look through the rest of the items. I decipher that "Lime J" is "lime juice." That one is easy! But goodness knows what "Lemon P" is! Eventually in my determination to decode this mysterious notation, I realize that "DWD" stands for "dishwasher detergent." "Of course," my spouse shrugs when I bring this strange symbol's meaning to his attention, "It's obvious." I am beginning to suspect that acronyms are probably a given for this hard core gamer. And writing them out seems apparently to have become another game in itself, since I am finding more of them than ever before in my messages from him. Or perhaps I am merely more conscious of something which in reality has been quite commonplace and merely predates my current awareness? In my newfound cognizance, I see stickie notes pasted on the computer monitor in the office. I can't understand what's written on them. There are scribbles (of something) on papers in the car glove compartment. Surely these elaborate notations must be important or they wouldn't have been written down in the first place, but I am at a loss to understand them. Scraps of paper with penned game moves leave a trail of evidence of my gamester's presence. I postulate all these hieroglyphics are simply fundamental to the workings of a mind which works far differently from my own. Really, I know it does!—I turn the water taps on *before* I step into the shower. BTW, BOT and FWIW, Lemon P is still NK. CUL. ■

Dameo and Croda Problem Solutions

Problem 1: 1.f1h3 h4:h2:f2, 2.g7f8+. *If White promotes immediately, he will lose!*

Problem 2: 1.e2c4 a5:a3:c3:e3, 2.c4:c6:e6:e4:e2 a6b5, 3.a2a3 b5c4, 4.e2d3.

Problem 3: 1.g3d6 d7:d5:f5, 2.f3g4 f5:f3:d3, 3.g4:g6:e6:e8+ f7g6 *(If 3....d3d2 or d3c2, then 4.e8e1, and 5.e1d1 or e1c1.)* 4.e8e1 g6h5, 5.e1d1 h5h4, 6.d1:d4 h4h3, 7.d4g1.

Problem 4: 1.e3c5 c6:c4:e4:e6, 2.h3h4 a5:c5:e5. 3.h4:h6:f6:d6:d8+ e5f4, 4.d8a8 a6b5, 5.a8a5 b5b4, 6.a5a3. *Don't arrive here with White to move!*

Problem 5: 1.h1f3 b5:b3:b1+, 2.g2e4 b1:f1:f4, 3.e4:g4:g6:e6:c6:a6.

Problem 6: 1.d1f3 g3:e3:e1+, 2.f4g5 e1:h1:h5:f5, 3.d4:f4:f6:f8:d8:b8+.

Problem 7: 1.h3g4 g5:g3, 2.d1f3 g3:e3:e1+, 3.d2e3 e1:e4, 4.a3c5 c6:c4, 5.b4:d4:f4:f6:f8+ e5e4 *(If 5....e5d4, Black goes for the other corner. The outcome is similar: White can convert the position into a two-versus-one king's endgame.)* 6.f8a8 a7b6, 7.a8:a5 e4f3, 8.a5g5 b6b5, 9.g5:a5 f3g2.

Problem 8: 1.e3f4 g4:e4 *(No choice.)* 2.e1g3 h3:f3, 3.f2:f4:f6:h6 e4f3, 4.h6h7 f3g2, 5.h7h8+ g2h1+, 6.h8a1.

Problem 9: 1.e4d5 g5:e5:c5:a5, 2.d4e5 e6:e4, 3.d3b5 a5:c5, 4.c4:c6:e6:e8:c8:a8+ *(White will convert the position into a two-versus-one king's endgame.)* 4....e4f3, 5.a8h8 h5g4, 6.h8h2 g4g3, 7.c3b4 f3f2, 8.h2:a2 g3h2.

Problem 10 *(Yes, White can win a man by moving any of three men to d5 or f5, but it doesn't win him the game.)* 1....h4:h2:f2, 2.d4d5 b6:b4:d4:f4, 3.d5:d7:f7:f5:f3:f1 h5h4, 4.e5f6 h4h3, 5.f6g7 h3g2, 6.g7h8+ b7a6 *(If 6....g2h1+, White moves 7.h8a1.)* 7.h8g7 g2h1+, 8.g7a1.

Problem 11: 1.e2c4 *(1.d3c4? d5:d3:d1:b1+, 2.c4:c6:e6 b1e1! doesn't work for White, and neither does 1.a2a3? b3b2, 2.c2:a2 b4c3! or 1.c2c3? b6b5, 2.c3:a3 b4c3!. Finally 1.c1c3? fails on b4b2! 2.c3:a3 b2c1+.)* 1....c5:c3:e3, 2.d2d3 *(Sacrificing the ladder to get the man back to c3.)* 2....e3:c3, 3.c2:c4:a4:a6:c6:e6 d5:d3, 4.e6d7 *(Now just keep in the same column....)* 4....d3e2, 5.d7e8+ b3b2 *(If Black promotes, White moves 6.e8a8.)* 6.a2:c2 *(If e8:e1, Black promotes on a1, winning a man, and forcing White to move his last man across the entire board to convert to a two-one king's endgame.)* 6....e2e1+, 7.c1d2.

77

77 **77** - a game by larry back **77**

7 | 7

6 | 6

5 | 5

4 | 4

3 | 3

2 | 2

1 | 1

| 0 | 1 | 2 |