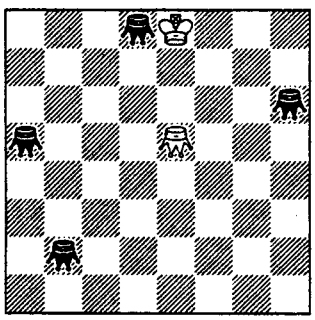
"Eureka" Chess Problems

by Peter Fayers
incorporating "Penultima" by Michael Fryers

Some time ago I got hold of a copy of Popeye, the chess-problem solving program. This is excellent value-for-money, being free, and an added bonus on the disk was a directory containing some 600-odd chess problems, mostly fairies (as we problemists call Variant Chess problems). The downside was that it was all in German, a language about which I know virtually nothing.

(A)



SS#8, "Gitterschach"; Gs
1 Kd7; 2 Ke6; 3 Kd5; 4 Ke4:
5 Ge3; 6 Kd3; 7 Ke2; 8 Kd1 Gd2.

I soon picked up the basics. It seemed that a lot of the problems had obtrusive force, with several promoted bishops on the board, until I realised that perhaps "B" means "Pawn" in German. This turned out to be so, and I was soon able to translate the basic pieces KQRBSP as KDTLSB. But I hit more trouble with problem (A), a series-selfmate in 8, Gitterschach.

I had already worked out that G is in fact Grasshopper, but what, pray, is Gitterschach? Unperturbed, I let Popeye solve it for me, then played through the solution. I was still no wiser, and had to work through another Gitterschach problem before the penny dropped.

It struck me that there is a whole new field of chess problem possibilities here! In a normal problem, you are given the position and the condition, and have to find the solution. In a synthetic, you are given the condition and the solution, and have to construct the original position, so how about a problem where you are given the position and the solution, and have to work out the rules?

I knew that this idea was not new - it had been used in a card game "Eleusis" [Robert Abbott, *Abbott's New Card Games* 1965], where a referee makes up a rule (eg "play red on even, black on odd"), and two players attempt to lay cards alternately - the referee states whether each play is legal or not, and the players try to work out what his rule is. I thought it would be a novel idea to apply this concept to chess.

Alas, I had been anticipated. When I mentioned the idea to my son, I discovered that something similar was already being played by members of the Puzzles and Games Ring (PGR) of the mathematics society at Cambridge University, who call themselves the Archimedeans (the abbreviation C.U.M.S. having already been used by the local musicians).

I contacted this august body, and received the following write-up from Michael Fryers.

❖

The game of Penultima is a chess variant for 3-8 people; 5 is ideal. It was invented by Michael Greene and Adam Chalcraft at a meeting of the PGR in 1994, and developed through being played at PGRs since then.

Rules: 2 of the people involved are referred to as Players, the others being called Spectators. The 6 classes of piece (king, queen, bishop, knight, rook and pawn) are allocated to the spectators in some manner: the way we have done this is by taking one piece of each class, putting them in the middle of the board and then taking turns to claim them. This is rather informal; if some spectator particularly wants, say, the bishop and rook, they can request this; most of the time spectators won't mind which pieces they're allocated.

The spectators then devise a rule for their pieces: most commonly, a movement and capture rule akin to those in chess or its fairy variants, but more complex ideas can be used---there are no restrictions on the rules, except that all the spectators should be attempting to produce a playable game. To indicate that the rule is decided, the spectator returns the piece to the board; they do not tell their rule to anyone else, player or spectator.

Each spectator should also think of a name for their pieces, which may be a helpful hint or not; when all the pieces have been returned, the names should be announced and the game can begin.

The board is set up as for a game of chess between the two players, except that a spectator may for the purpose of their rule place their pieces in other positions. (For example, a spectator who owns both king and queen may arrange them so the board has rotational symmetry; one of the rooks may be placed upside-down; the bishops might start on vertices of the board

rather than in the squares, etc.) Black moves first.

The players are attempting to check-mate the king, just as in chess, but of course a preliminary aim must be to work out enough of the rules to achieve this.

On a player's move, they make some chess-like move of a piece. The spectators whose rules apply (in particular, but not only, the spectator who owns the moved piece) then examine the proposed move, and do one of three things: (i) allow the move to stand, as a legal move according to the rules; (ii) allow the move, but modify the position to complete the side-effects of the move (for example, other pieces might be captured, or moved); (iii) declare "illegal move" and restore the position before the move was made.

If, in the position after the move, the moving player's king is in check, the spectator who can see this (this might need consultation between spectators ---see below) should simply say "illegal move". If, as a consequence of side-effects in accordance with (ii), the position becomes illegal according to some other spectator's rule, that spectator should say "illegal move".

Further side-effects might occur as a result of side-effects that move other pieces. If, after a legal move has been made and all its side-effects effected, the opponent's king is in check, one of the spectators should say "check".

When a move has been declared illegal for whatever reason, the player who made it shall lose their move, and the other player move next, except that if a player's king is in check and they make an illegal move, then after the position has been restored they shall attempt to move again. The game is only lost if there is no legal move out of check. Since a move that allows the game to continue might be of a type that has never occurred to either of the players, it must be allowed for the player, having tried every conceivable move and failed, to ask the spectators to determine whether check-mate has been found, and if not to show a legal move. This should only be done in extreme cases, however.

The game ends when the spectators agree that check-mate has been achieved, or that stale-mate (no check, but no legal move for either player) has occurred, or when all those involved agree to call it a draw (or, I suppose, when one of the players resigns). After the game the rules can be revealed and discussed, but if a rule never really came into effect, its inventor might reserve it for future games and not reveal it.

If situations occur as a result of one spectator's rules that were not envisaged by another rule-maker, or in other circumstances where rules seem to conflict, the concerned spectators should leave the room to settle the matter, explaining such parts of their rules as are needed. The spectators also are involved in the fun of attempting to determine each other's rules, so this discussion should be kept to a minimum. Of course, situations might arise wherein it becomes clear that earlier moves in the game were illegal as a result of a combination of rules that were only known separately; in that case (or in the case of check being missed, or check being called wrongly or (rarer) moves being wrongly disallowed) the previous decisions should stand and perhaps the players should be informed---this is up to the spectators' judgement.

There may be rules in which it is hard to guess a legal move for a piece; for example, the bishop might move exactly 13 squares starting in any direction and bouncing off pieces and board edges in some complicated way. In this case, the spectator might wish to take an attempt to move the bishop one square in a particular direction as an incomplete move rather than an illegal move, and "complete" the move by moving the bishop to its actual legal destination square. The spectator must use their judgement to decide how nice to be about this. They should, of course, be fair to the two players.

I shan't list example rules ---basically you should start with the usual fairy-chess-type moves, and then try out more complicated ideas. There is no actual restriction on the rules, except that the aim is to produce a playable game. I hope this is sufficient of a description to let you play the game.

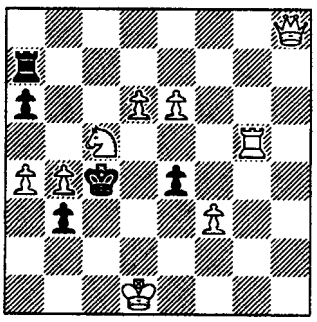
After a few games with the same group of people you'll probably have an entirely different idea of the game to the original inventors.

Wow! So, for those of you with the cerebral abilities of Cambridge mathematicians, there is another variant for you to try out. Good luck! For the rest of us mere mortals, may I suggest a cut-down version, which I shall dub "SemiPenultima". This is exactly as above, except that we go back to the Eleusis idea of only one referee ("spectator"), and only one rule change. With just one rule change, it does not have to relate to any specific piece, but can be any

variant form, e.g. "vertical cylinder", or "monochrome". (Perhaps Vertical Cylinder is not such a good idea for a game, as the vast majority of moves would be legal - only when the board emptied and Kings were prone to check across the edges would any indication be given.)

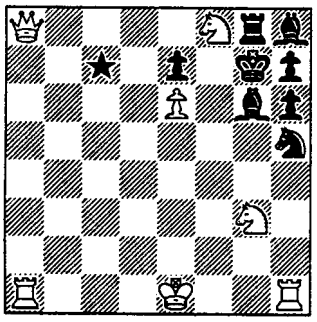
My own reason for suggesting this is that Penultima as described above is not very suitable for the original idea of a new problem form, whereas with SemiPenultima we can do just that. Try these two for size; in each case the position and the key move to the solution is given. All you have to do is to work out which fairy condition has to be in force to make problem (B) sound, and what is the White fairy unit on c7 in (C).

(B)



#2 Variant? (b) wPe6 → f7
(a) 1 S×e4! (b) 1 Ke1!

(C)



#2 White piece c7?
1 0-0-0!

This article was all finished and ready to send off, when a sudden thought occurred to me. I checked through the ECV to see if anyone else had been having the same ideas. They had - there is already something similar in existence: it was invented by BCVS member Ian Richardson, and first published in this very magazine (issue 3, back in 1990).

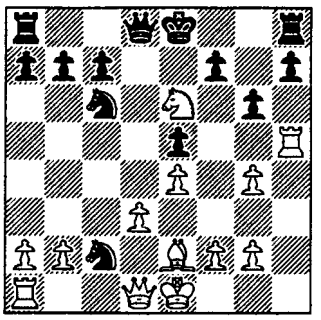
Now how about this for a coincidence; Penultima was invented by a group called The Archimedeans, and Ian dubbed his game "Eureka"!

Ian's game can also be played by more than three, but whereas in Penultima there are two players and several rule-makers, in Eureka there is only one rule-maker (and only one rule change), but there can be several potential players. The drawback is in the play mechanics, which are primarily directed at producing an equitable scoring method. These seem excessively complicated, but do at least result in a legal game with the new rules. (In Penultima, a player misses his turn if he attempts an illegal move. Actually, you could argue that this is an advantage - a game is more likely to reach a speedy conclusion if one player knows what is going on and is playing to win, while the other is having half his moves disallowed and is going nowhere).

Anyway, back to the problems (which is why I'm writing this in the first place, after all.) These can just as viably be described as "Eureka" problems as "Semi-Penultima" ones, and since Ian got there first, Eureka problems shall they be.

As a parting shot, Ian gives a game score for one of the games where the rule is that each player must move (1) straight forwards or backwards, (2) towards the right, (3) towards the left, then repeat the sequence throughout the game.

(D)



Position after 12 ... S×c2

The game went: 1(S) e4 e5; 2(R) Sc3 Sf6; 3(L) Sf3 Sc6; 4(S) d3 d6; 5(R) Bg5 Be7; 6(L) Be2 Bg4; 7(S) h3 d5; 8(R) S×d5 S×d5; 9(L) h×g4 B×g5; 10(S) Rh5 g6; 11(R) S×g5 dSb4; 12(L) Se6 S×c2 (Diagram D.) Ian wrote here: "A bombshell for White as it is mate! White's next move must be straight, so 13 Q×c2 is not legal, and the King cannot move either." *What did the players miss?*

Solutions below.

Would Variant Chess readers be interested in a regular "Eureka" corner, say a couple of problems per issue, with its own ladder scores? Let us know.

Eureka Problem Solutions:
(A) "Gitterschach" is Grid Chess. (R Queck, *Problemkiste*, 1990). And don't blame me for not showing the grid - Popeye didn't display it either!
(B) Circe. (J C van Gool, *The Problemist*, 1984)
(C) Camelrider. (Stefan Klebes, *Feenschach*, 1986)
(D) It isn't mate! White may have to move straight forwards or backwards next move, but then so must Black; he cannot play Sc2×e1, and so White is not even in check at the moment!