British Endgame Study News

A first survey of

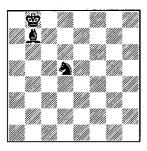# six-man pawnless endings

White wins by Kd4 (eventually!)

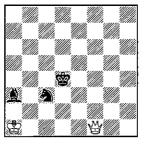# A first survey of six-man pawnless endings

When Timothy Whitworth and I wrote *Endgame magic*, we included a four-page "summary of endgame theory" listing the principal "wins" and "draws" that had been discovered by endgame analysts. The publication of Ken Thompson's recent data on six-man endings has enabled the matter to be taken further forward. A brief but definitive exposition does not yet appear practicable and may even be theoretically impossible (the game of chess is technically "hard", which means that there are areas where no exposition can be significantly more economical than listing every position and its result independently), but I hope the present summary will be found helpful.
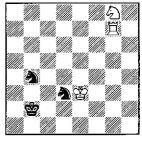
A preliminary look at some four-man and five-man endings will illustrate some of the difficulties. **Rook against knight** and **bishop and knight against knight** are "generally drawn", but there are exceptions of three kinds: the attacker may be able to win an unguarded or overwhelmable man within a few moves, the defender may be cramped against the edge of the board and unable to avoid mate, or the defender's men may be separated and the attacker may be able to prevent them from coming together. Some of the wins in the third class are very long and difficult.

Conversely, **queen against rook** is "generally won", but again there are exceptions: the defender may be able to win material within a few moves, or he may be able to force a draw by perpetual check or self-stalemate.

Any useful general statement must exclude such cases as simply as possible, and in *Endgame magic* we restricted ourselves to positions in which both sides had organized their forces to reasonable advantage and neither king was trapped against the edge of the board. This restriction was helpful, and I also assume it here. But even this does always allow statements which are simple, precise, and comprehensive; the boundary between "difficult wins" and "hard-to-hold draws" is often tortuous, and its meanderings can take it deep into the realms of apparently ordinary positions.

1 - a fortress against K+Q   2 - a blockade (WTM)   3 - White can win (Kd4 etc)

Some "generally won" endings feature exceptional positions of two further kinds, the "fortress" (see **1**) and the "blockade" (see **2**). The ending Q v B+N is in general won, but if Black can reach the Karstedt position **1** he will hold the draw. The blockade **2** is an animal of a different kind. Black to play in this particular position would lose (he would have to move bK away from bN, allowing wQ to advance), but

White to play has nothing better than **1 Qa6** and the reply **1...Bc1** repeats the position. No attempt is made in what follows to list exceptional fortress and blockade positions, though some use has been made of them in diagnosis: if a particular draw appears to depend on the weaker side's being able to maintain a blockade, it is a very strong indication that the ending should be regarded as "generally won".

Having set the scene, let us proceed to the six-man endings. The ordering is by Black men, N, B, R, Q, and as is usual in such expositions we ignore the 50-move rule.

Endings with **three pieces against one** are relatively straightforward, and in no case does the computer's analysis appear to have overturned accepted wisdom.

Any three pieces win against a lone knight (except for three same-colour bishops, of course). In particular, the case of three knights against one has long been regarded as won, and the computer data confirm. Even the case of knight and two same-colour bishops is a win (analysis by Walter Veitch, reported on page 350 of *Test tube chess* and more extensively on pages 289-90 of *EG* 26 and pages 81-2 of *The best of Bent*).

Any three normal pieces win against a lone bishop (in particular, bishop and two knights win, as do three knights). The only non-winning combinations are (a) three same-colour bishops, (b) three bishops only one of which runs on the same squares as the opposing bishop, and (c) knight and two same-colour bishops which run on the squares not used by the opposing bishop.

Three knights against rook and **bishop and two knights against rook** only draw, but any stronger combination wins (except for three same-colour bishops and knight and two same-colour bishops). The case of rook and two knights is missing from the Thompson data, but there seems no reason to disturb the pre-computer verdict.

Three minor pieces against queen and **rook and two minor pieces against queen** only draw, but any stronger combination wins. In particular, **two rooks and knight** win, as was demonstrated by Walter Veitch in our June 1998 issue, as do **two rooks and bishop** and **queen and two knights**.

Endings with **two pieces against two** are not so easy. The natural first step is to consider what happens if we swap off pairs of similar pieces, but only the attacker can rely on being able to force a desired exchange; the defender may not find it so easy. We have already seen this in the three-against-one endings, where "X+2N v X" is regularly won even though the attacker cannot afford to exchange Xs.

An example is provided by **rook and knight against two knights**. This can indeed be regarded as "generally drawn" in accordance with accepted pre-computer wisdom, but the extra knights help the attacker and the defender must establish himself well away from the edge of the board; even a position such as **3** can eventually be won by White. This position arises six moves into the 243-move win discovered by Lewis Stiller, and in a sense it sums up the ending: to win against a well-organized defence, White must command the centre and perhaps a little more, but his pressure need not be immediately overwhelming and the details may be immensely complicated.
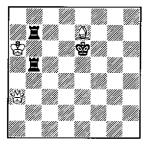
Other pairings against two knights can be dealt with more quickly. **Two minor pieces** only draw, but **rook and bishop** win (this was conjectured in pre-computer
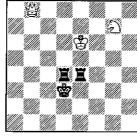
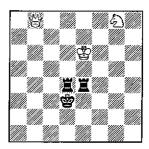days, notably by John Roycroft in *EG* 8) and so does any stronger combination.

Two minor pieces against bishop and knight and **rook and knight against bishop and knight** are only drawn, but **rook and bishop against bishop and knight** provides a major upset to pre-computer theory: the rook and bishop *win* if the bishops run on squares of different colours. Several studies have been upset by this discovery. The ending is generally drawn if the bishops run on squares of the same colour, but again there are more winning possibilities than were realised in pre-computer days.

Rook and minor piece against two bishops only draw (except that rook and knight win against two same-colour bishops), but any stronger combination wins.

Two rooks against rook and minor piece only draw, but **queen and any piece** win.

4 - White to move can win   5 - White can win   6 - draw only

Queen and bishop against two rooks is a *win*. It is tempting to say "contrary to accepted pre-computer wisdom", but Kling and Horwitz said just this back in 1851. However, many including myself have assumed it drawn on the grounds that if the rooks are defending each other on squares inaccessible to the bishop and the opposing king is cut off, what can the attacker do? The answer is "quite a lot". If we look at the longest reciprocal zugzwang and follow the play for a few moves, we get **4** with White to move, and if he can win from here he can surely win from almost anywhere.

Queen and knight against two rooks is not as clear. I personally think it also should be regarded as generally won, but the rooks have more scope than against queen and bishop and White's position must not be too disadvantageous. Set up **5** and he can win (though it takes 96 moves); move wN to g8 as in **6**, and he cannot.

Finally, **queen and rook against queen and minor piece** is only a draw, but **two queens against queen and rook** is a win.

In calling this a "first" survey, I have implicitly assumed that someone will eventually produce a second. I would expect this not only to pick up any errors in the present survey and perhaps to go more deeply into endings such as rook and knight against two knights and queen and knight against two rooks, but also to identify any "fortress" positions that may exist in "generally won" endings. Such fortresses should be easily found by tabulating counts of "wins" and "not wins" classified by the position of the Black men, but this can only be done by someone who can run quickly through the whole of the data; it cannot be done from the far end of a telephone line.