A beautiful endgame study

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This beautiful endgame study was composed 150 years ago by the great chess problem composer, Sam Loyd.

It is White's turn to move and win. Checkmate with a single bishop is impossible. On the other hand, checkmate with a Queen is very easy, so White needs to promote the h pawn to a Queen, if possible. But the queening square h8 is a black square and the bishop is white-squared, so the bishop will not be able to support the pawn on h8. This is crucial, as the pawn has to advance 3 squares to h8, and Black's King only has to move 3 squares sideways to h8.

To illustrate the problem that would result from immediate pawn advances to h6 and h7, even though the bishop would be able to support the pawn, Black's King would be able to move to f7 (or f8), then to g7. Once on g7 Black's King would be able to capture the pawn if it advanced to h8. Alternatively, if the pawn remained on h7, Black's King would be able to move to h8 and block the pawn's further advance. Once Black's King occupied g7 or h8, neither the bishop nor White's King would be able to dislodge it from those two squares. For example, if the pawn were on h7, supported by the bishop, and Black's King were on h8, then White's King would not be able move to f6, f7 or f8 without resulting in stalemate, which would be a draw. Stalemate would result from the rule that Kings are not permitted to move into check.

So White needs to prevent Black's King from reaching g7 or h8. But how? The preventive strategy is patient, ingenious and truly beautiful. Firstly, the bishop must move to e6, where it will prevent Black's King from moving to f7.

Variation A: If Black's King moves immediately to f8, the pawn will advance to h6. The bishop and the pawn will then combine to prevent Black's King from further sideways movement. The bishop will control g8, and the pawn, g7. Black's King will not be able to reach g7 or h8, and White's King will approach via g5 and escort the pawn to h8, where it will queen, and checkmate will follow.

Variation B: If Black's King moves to e7 instead, threatening to capture the bishop, the pawn will still advance to h6. Now Black's King will not have time to both capture the bishop and prevent the pawn from queening. To illustrate, if Black's King captures the bishop on e6, the pawn will advance to h7. Black's King will be one square too far away to capture it when it queens on h8, and checkmate will follow.

Variation C: If, instead of capturing the bishop on e6, Black's King moves to f6, the bishop now retreats to f5, preventing Black's King from approaching the pawn via g6. As we have seen before, if Black's King captures the bishop on f5, the pawn will advance to h7. Also, in this position, Black's King cannot approach the pawn from behind (via g5) as the pawn will march forward, one step ahead of Black's King. Black's King will be one square too far away to capture it when it queens on h8, and checkmate will follow.

Variation D: If, instead of capturing the bishop on f5, Black's King moves from f6 to f7, the bishop now moves to h7, in front of the pawn on h6. The bishop and the pawn will again combine to prevent Black's King from further sideways movement. The bishop will control g6 and g8, and the pawn, g7. We have seen previously that if Black's King moves to f8 while the bishop and the pawn combine to prevent it from further sideways movement, it will not be able to reach g7 or h8. White's King will approach via g5 and escort the pawn to h8 where it will queen, and checkmate will follow.

Variation E: Finally, if Black's King moves from f7 back to f6, intending now to approach the pawn via g5 and capture it while the bishop is in front of it, White's King will prevent that by moving to f4. Black's King will now be permanently blocked from access to g5–g8 and h8. White's King will approach via g5 and escort the pawn to h8 where it will queen, and checkmate will follow.

This beautiful endgame study illustrates the importance of forward planning, controlling key squares, counting squares and moves, and avoiding stalemate. **BN**