MISSING A WON VARIATION

M. Schijf[1], L.V. Allis[2] and J.W.H.M. Uiterwijk[1]

The Netherlands

In our article "Proof-Number Search and Transpositions" (*ICCA Journal*, Vol. 17, No. 2, pp. 63-74), we described methods to make pn-search applicable to directed (a)cyclic graphs, such as encountered in chess. In order to show the strengths and weaknesses of these methods we provided a detailed analysis of two of the positions investigated by our program.

In the process of analyzing the data provided by our program, indicating that the second position denoted by C284 (Diagram 2, p. 73) is a mate-in-10, we have made an error. We presented a mate-in-10, which contains a suboptimal move by White. If White plays optimally, the line converts into a mate-in-11, as shown below.

After **1. ... h1B 2. Kh2 Ba8 3. Kg3 Bb7** (to lose a tempo) **4. Kh3** (instead of Kh2) Black cannot win within 7 moves (as required for a mate-in-10), but needs one more move. For example **4. Kh3 Kf2 5. Kh2 Ba8** (to lose another tempo) **6. Kh3 Bf3 7. Kh2 Bxg4 8. Kh1 Bh3 9. Kh2 g4 10. Kh1 Bg2+ 11. Kh2 g3 mate.**
We remark that the mistake made was an illustration of human fallibility, for which the program is not to blame: indeed a mate-in-10 exists as shown below. The correct and complete variation reads: **1. ... h1B, 2. Kh2** (Kh3 leads to a mate-in-9 after 2. ... Kf2 3. Kh2 Ba8 4. Kh3 Bf3) **2. ... Bf3 3. Kg3** (Kh3 leads to a mate-in-8) **Be2** (Bd1 or Ke2 are also leading to mate-in-10) **4. Kh2** (Kh3 leads to a mate-in-9) **Kf2 5. Kh3 Bf3 6. Kh2 Bxg4 7. Kh1 Bh3 8. Kh2 g4 9. Kh1 Bg2+ 10. Kh2 g3 mate.**

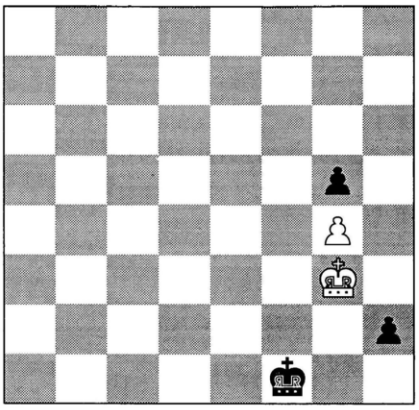

Diagram 1: Black to move. (Krabbé, 1985, p. 182)

Thus, despite the incorrect analysis, the claims regarding our enhancements to pn-search remain unaffected.

We are utterly grateful to Steve Dyson who took the trouble to write to one of us from as far afield as Kalulushi, Zambia. His program Kalulu specializes in chess problems of the type 'White to play and mate in *n* moves'. He adds to his analysis, gratefully reproduced above, that it is not clear from the text whether the incorrect solution to C284 is due to a typographical error (although this seems unlikely), an error in the coding of the algorithm or a counter-example to the paper's assertion that "a proof is reliable".

Although not found by our program (nor by Krabbé), an even shorter variation to mate exists. In Krabbé (1985, p. 182) it is stated that 1. ... h1B leads to the quickest win (mate-in-10), but the variation given below is a mate-in-8: **1. ... Kg1! 2. Kf3** (2. Kh3 h1Q 3. Kg3 Qg2 mate) **h1Q 3. Ke3** (3. Ke2 Qd5 4. Ke1 (or Ke3) Kg2 5. Ke2 Qd4 6. Ke1 Kf3 7. Kf1 Qf2 mate; 3. Kg3 Qg2 mate) **Qd5 4. Ke2 Qd4 5. Ke1** (5. Kf3 Qd3 mate) **Kg2 6. Ke2 Kg3 7. Ke1** (7. Kf1 Qf2 mate) **Kf3 8. Kf1 Qf2 mate.**

Reference

Krabbé, T. (1985). *Chess Curiosities*. George Allen and Unwin, Ltd., London. ISBN 0-04-794021-2.

[1] University of Limburg, Department of Computer Science, P.O. Box 616, 6200 MD Maastricht, The Netherlands. Email: schijf@cs.rulimburg.nl, uiterwijk@cs.rulimburg.nl

[2] Vrije Universiteit, Department of Computer Science, De Boelelaan 1081a, 1081 HV Amsterdam, The Netherlands. Email: victor@cs.vu.nl