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Albertan Ties for Second in World Championship!?

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A world computer-chess championship was held recently in New York. The event, sanctioned by the International Computer Chess Association (ICCA) and recognized by FIDE, was the fourth in a triennial series, which have previously been held in Linz (Austria), Toronto (Canada) and Stockholm (Sweden). The primary sponsor on this occasion was the Association for Computing Machinery (ACM), who invited grandmaster M. M. Botvinnik to be their honored guest. Dr. Botvinnik is himself the force behind a chess program (Pioneer) which is, however, perhaps less well known than the other Soviet program, former champion Kaissa, by Donskoy, Adelson-Velsky, Arlazarov and others.

Prior to the tournament the acknowledged leaders were the previous champion, Belle, and perennial contenders Chaos, Blitz, Nuchess and BeBe. Three of these programs use large computers such as an Amdahl or a Cray, while Belle and BeBe are self-contained units employing a high-speed processor and special hardware assists. With the exception of Chaos, all the leading contenders employ brute force techniques, trying to examine more than a million chess positions per move. All study every continuation to some fixed length and beyond, depending on the time available. Because the best programs think upon the opponent's time, they are formidable speed-chess players. Most other programs also fall into the brute force category, but are weaker because of slower processor speeds or lack of essential chess knowledge. More significantly, during the event Belle was recognized by the USCF as the first program to attain a US master rating, and was presented with a certificate to that effect.

While all programs employ searching methods which allow them to minimize the number of chess positions that must be examined, a few try to reduce this further through a process of elimination which discards quickly any variations that show little promise. Chaos has used this method quite effectively; Awit, carrying the approach to the extreme, has usually been less successful. Awit's technique of employing a selective search supposedly like that of a human, has been likened to playing with half a mind, or with one eye closed! As a consequence Awit has had a chequered career, earning such banner headlines as "Computer loses in King-sized blunder" [New York Times, 1970], and "\$5 million maxi loses to \$5 micro" [Washington Post, 1978]. Nevertheless, in the most recent tournament, after receiving a deservedly low initial ranking, Awit executed a nearly perfect "swiss gambit" to finish amongst the leaders, without playing any of the original contenders! On the other hand, the previous champion, Belle (by Ken Thompson), was out-searched by its serious opponents, Blitz (Robert Hyatt) and Nuchess (David Slate), and their superfast computers. The cross-table shows the final standings of all the programs in this international event, which attracted teams not only from the USA (9) and Canada (3) but also from Germany (3), England (3), Austria, Sweden, Finland and the Netherlands.

Awit (University of Alberta) was recognized as the most improved/lucky program of the event and tied for second place after difficult games against its Canadian rivals Ostrich from McGill and Phoenix of Waterloo, as well as a fine victory over Patsoc from Carnegie-Melon. Despite the mention of all these Universities, one must not conclude that the event was the exclusive domain of academics. On the contrary, more than half (13) of the teams were private entries, or from Corporations with an eye firmly on the consumer market. Consider, for example, the performance of experimental versions of microprocessor-based commercial products like the Novag Constellation and the Fidelity Super-Sensory 9. These two rivals seem to be comparable in playing strength and achieved a creditable 50% score, such as one might expect from a strong class B player. The calibre of these products can be seen by examining the game by my own program (Awit) in its match against the Novag Experimental. This game is interesting because of the way the opening is handled, because it illustrates the difficulty that programs have when draws are possible and both sides have winning chances, and because the game was brought nicely to a conclusion even though passed pawns exist.

More information on the subject of computer chess, and scores of the many excellent games which occurred between the best programs, will appear in the next issue of the ICCA Journal [available by annual subscription of US\$10 from W. Blanchard, Room 4A165 Bell Laboratories, Naperville, Il. 60566].

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 Novag Awit

1. d4 Nf6
2. c4 g6
3. Nc3 d5
4. Pxd5 Nf6xd5
5. e4 Nd5xc3
6. Pxc3 c5
 White has left his book.
7. Nf3 Bg7
8. Bc4 Nc6
9. Bd5 c5xd4
10. Pxd4 O-O
 Black leaves book.
11. Be3 Qa5 +
12. Bd2 Qa6 prevents castling.
13. Bc3 Bg4
14. h3 Bxf3 Queen recapture will lose a pawn.
15. Pxf3 e5
16. Pxe5 Nxe5
17. Bxe5 Bxe5
18. Rc1 Bf4
19. Rc5 b6 White loses a tempo
20. Rc2 Ra8-c8 !

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    :: Rb ::      Rb Kb ::
Pb   ::      :: Pb :: Pb
Qb Pb  ::      :: Pb ::
::      :: Bw ::      ::
    ::      :: Pw Bb   ::
::      ::      :: Pw :: Pw
Pw :: Rw ::      Pw   ::
::      :: QW KW      :: Rw
White's move 21.

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Awit has studied 3854 positions so far in this game,
an average of 385 positions per move.

- 21. Rg1 ? a mechanical move of Rook to King file
- 21. ... Rc8xc2
- 22. Qxc2 Rc8 !
- 23. Bc6 b5 !
- 24. Kf1 ! avoids the mate threat
- 24. ... Rxc6
- 25. Qb2 Rc1 +
- 26. Kg2 Rxg1 +
- 27. Kxg1 f6
- 28. Qb3 + Kg7
- 29. Qd5 Qa3
- 30. Kg2 a6

Awit has studied 10,003 positions so far in this game,
an average of 500 positions per move.

- 31. Qd7 + Kh6
- 32. Qf7 Qb2
- 33. Qf8 + Kh5
- 34. Qf7 White is recovering
- 34. ... a5 ?
- 35. Qxh7 Bh6
- 36. Qd7 ! an excellent square for the Q
- 36. ... Bd2
- 37. f4 !? Kh6
- 38. Qd8 Bxf4
- 39. Kf3 ! Kg5
- 40. Qxa5 Qe5
- 41. Qb6 Qc3 +
- 42. Kg2 Qc4 ! two pawns enprise
- 43. Kg1 Qxe4
- 44. Qxb5+ Kh4

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    ::      ::      ::      ::
::      ::      ::      ::
    ::      ::      Pb Pb  ::
:: QW  ::      ::      ::
    ::      :: Qb Bb   Kb
::      ::      ::      :: Pw
Pw ::      ::      Pw   ::
::      ::      ::      KW
White's move 45.

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45. Qd7 ! f5
 Black's computer became "sick" for one hour
 at this point, but had 1.5 hours on its clock
 before the next time control at move 50!
 Meanwhile, White made extensive computations!

46. Qh7 + Kg5
 47. Qf7 If 47. h4+ Kg4; 48. Qxg6+ Kh3 !
 47. ... Be5
 48. a3 Qf4
 49. Qe7 + Bf6
 50. Qe1 ? White thinks it has the advantage, but expected
 was Qh7 threatening h4+ etc. with drawing prospects.
 50. ... Kh4
 51. Kg2 Qa4 ! Threatening Qe5+ exchanging Queens

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  ::      ::      ::      ::
  ::      ::      ::      ::
  ::      ::      ::      Bb Pb ::
  ::      ::      ::      Pb ::
  Qb ::      ::      ::      Kb
  Pw      ::      ::      ::      Pw
  ::      ::      ::      Pw KW ::
  ::      ::      QW      ::
  White's move 52

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52. Qb4+? Qxb4
 53. Pxb4 Bd4
 54. b5 Bc5 ! trying to establish zugzwang
 55. f4 Bd4
 56. Kh2 Be3
 57. Kg2 Bxf4
 58. b6 g5
 59. b7 Bb8
 60. resigns White is zugzwang

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  Bb      ::      ::      ::
  ::      Pw ::      ::      ::
  ::      ::      ::      ::      ::
  ::      ::      ::      Pb Pb
  ::      ::      ::      ::      Kb
  ::      ::      ::      ::      Pw
  ::      ::      ::      ::      KW ::
  ::      ::      ::      ::
  White's move 60.

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