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FEBRUARY 1984 • $2.00

Chess Life

The New Champion
Cray Blitz Defeats Belle To Become World's Top Computer Program
THE NEW CHAMPION

BY HAROLD BOGNER

The Sheraton Centre was jumping. Runners and revellers from the New York Marathon filled the huge second-floor ballroom, and the din carried into the chess tournament hall. Inside, play continued undisturbed, and international master Michael Valvo openly discussed the 11 games in progress with the throng of spectators, not worried about the players overhearing his advice.

Why? The "players" lacked the ability to hear — they were all computers.

Gathered from eight countries, they were vying for the fourth World Computer Championship. Some, such as the microprocessor-based program by FM David Levy, had been physically transported to the hotel, while others were represented only by a telephone line and a small terminal, linked to some of the world's most advanced machines.

Computer chess has come a long way since March 9, 1949, when Claude Shannon presented a paper entitled "Programming a Digital Computer for Playing Chess." More than three decades later, the defending champion had just established itself as the first certifiable master-level program. In the previous few months, Belle, of Bell Laboratories in New Jersey, had tied for top expert in the U.S. Open and shared first place in the New Jersey Open Championship, scoring well against frequent master competition (as described in the U.S. Open articles in October's Chess Life) and finally clearing the magic 2200 barrier.

Two other programs also appeared to be near the master level: Cray Blitz, of the University of Southern Mississippi, which had taken its recent title in the U.S. Open, and Northwestern University's Nuchess, a descendant of the second World Computer champion, Chess 4.6. At speed chess, these programs are monsters, holding up well against 2400-players, and winning some games from IMs.

The giant mainframe computer programs do not represent the only area of progress. A micro program by Novac's David Kittinger won a game from a master at last summer's U.S. Open, and the programs of Fidelity Electronics' Dan and Kathe Spracklen are assaulting the 2000 mark. Fully one-third of this year's entries were running on tiny microprocessors.

Work on these and other experimental chess programs is expected to continue making great progress, and the attendees at this event included two honored guests whose mere presence, let alone participation, should be sufficient evidence of the field's potential. Former world champion Dr. Mikhail Botvinnik came to the United States for the first time in his life at the invitation of the organizers, both to watch and to discuss. He had also attended the second championship in Toronto in 1977, and vowed to return next time as "a competitor." While he is no longer guaranteeing that his former throne will soon be occupied by a machine (as he did 15 years ago), he is currently working to develop an "artificial grandmaster."

On the other hand, Dr. Hans Berliner, who has held the world correspondence championship, came to play. Although his Patsoc 2.0 (for "plays a terrible sort of chess") managed only 1½/3½, a backgammon program that he wrote defeated the world (human) champion in Monte Carlo in 1981. He gives himself until 1990 to produce the same result at chess.

The tournament was set up as a five-round Swiss-system, one more round than in previous events, to make possible a clear winner from among the 22 programs. The games were played in the evenings and on Sunday afternoon, times when computers would be available more readily than during business hours. Some of the programs had as much computer time as they needed; others labored under four- or six-hour "curfews" that left the result up to the judgment of commentator and chief official Mike Valvo. Occasionally, a machine would "crash" or a phone line would go disconnected, so each team (computer and its programmers) was allowed 30 minutes each game when the clock could be stopped for such equipment problems. These brief "time-outs" featured frantic consultation, phone calling, and reprogramming by the operators, while the opposing team would wait, wondering if it might win on time. Fortunately, this never happened, though there were a few close calls.

ROUND ONE

The programs were seeded according to past results, to avoid early meetings by any of the favorites. The main contenders were considered to be Belle, Cray Blitz, and Nuchess, with Chaos (University of Michigan) and Bebe, a specially built "chess engine," expected to be close. The first three all won rather easily. Belle trapped a piece on move six against the Canadian program Phoenix, while Cray Blitz lasted through British BCP's opening gambit (the latter "woke up" after playing a book variation to find itself a pawn down, but had no idea how to carry out its attack). And Nuchess won in 34 moves from Levy's Philidor.

However, Chaos was held to a quiet draw on the Black side of a Queen's Indian Defense by German Schach 2.7, and Bebe was felled by Austrian program Merlin, which magically won a pawn in an ending of Rook and double Knights. Advance 3.0 of England sprung 10. a4 against Florian William Fink's Sfinks program's Marshall Gambit, so confusing the latter that it quickly gave up all its compensation and lost.

Fidelity's latest experimental version ground out a win against Dutch entry Pian, while Mephisto's latest micro notched a win on time on move 40 against its opposite number from Conchess, in a slightly better position. Conchess' team took the time forfeit very matter-of-factly — quite unlike a typical human opponent.

In the game between Awit (University of Alberta) and Ostrich (McGill University), the following amusing position was reached:

[Diagram of chessboard]

Awit's Bishop spent several moves on its precarious perch at a6, protected by the unusual influence of the Queen. Awit eventually realized its advantage. The two other games were quiet draws between Novac X (for "experimental") and West Germany entry Bobby, and Shy (Finland), and Patsoc 2.0.

ROUND TWO

As thousands of runners filtered into the hotel from the Marathon, Belle won a ½ Sicilian from Mephisto, Cray Blitz outsat Fidelity X (showing an excellent sense of humor. Fidelity Electronics President Sid Samole offered to sit in as operator in a hopeless endgame position, saying, "Here, I'll pull this out!"), and Merlin reached the following position as White against Nuchess:

Here, Merlin played 38. g4, and the programmers offered Nuchess a draw. Before Nuchess programmer David Slate could decide, TD Valvo said, "Wait a moment —
only the program can offer a draw. Otherwise, I have to approve the offer.”

Ken Thompson, Belle’s programmer and one of the senior computer chess people, ran over, crying out, “No GM draws!” Soon it was discovered that although a pawn up, Merlin had its Rock on a5 trapped. Play continued, and Merlin, probably wishing it were Houdini instead, lost quickly.

Advance 3.0 defeated Awtl on the Black side of an English to round out the perfect scores. Moving up to 1½-½ were Chaos, which outlasted Shy’s Budapest Defense, Schach 2.7, which won an even Queen-and- opposite-Bishop endgame against Novag when the latter lost its Bishop, and Patsox 2.0. Patsox was winning easily when Klopp overstepped on move 37, but Berliner seemed very relieved, revealing that his computer was having problems, and that he feared he would lose through a program failure.

An amusing situation occurred after Bebe had won its game against Philidor. Tony Scherzer, Bebe’s designer, and his crew usually sit through “her” games with a bottle of wine, taking Bebe’s word for what’s happening in the game. Scherzer explained to Levy that he never gets to go over the games his machine plays with “anyone who knows much about chess.” He wanted Levy to tell him how Levy’s program could have played better!

**ROUND THREE**

The leaders met, with Nuchess handling Belle her first loss in a computer chess competition since Ken Thompson and Joe Condon designed the special hardware version over five years ago. Cray Blitz easily outplayed Advance 3.0 on the White side of a Najdorf Sicilian. The Nuchess–Belle game has been annotated by Grandmaster Larry Christiansen, who gives us a sharp, objective criticism of the pluses and minuses of the machines’ play.

**RUJy LOPEZ**

W: Nuchess
B: Belle

**Annotated by Larry Christiansen**

1. e4 e5 2. Nf3 Nc6 3. Bb5 a6 4. Ba4
Nf6 5. d4 exd4 6. 0-0 Be7 7. e5 Ne4 8. Nxd4 0-0

Also possible is 8... Nxd4 9. Qxd4 Nc5 10. Qe4 Kf8, with roughly even chances. The premature development of White’s Queen is balanced by the disturbed situation of Black’s King.

9. Nf5 d5!

This equalizes easily.

10. exd6 Bxf5 11. dxe7 Nxe7 12. Be3
Nd5 13. Qf3 Nxc3 14. fxe3?

Anti-positional: 14. Qe3 is correct, with perhaps a slight edge for Black after 14... Qh4. Now White’s pawn structure is blunted and his development lags.

14. ... Bg6 15. Qf4 b5

Stronger is 15... Qe7. Why not leave the Bishop on a4 on its bad square?

16. Bb3 c5 17. c4

Not 17... c3, when 17... c4 18. Bc2 Nxc3!, wins.

17. ... Qf6

Black’s large advantage in development would be retained by 17... b4 or 17... Qe7.


21. Re1 Rad8 22. Nf1 Bd3!!

The positional 22... Nd7-e5 is the correct plan, followed by ... f6, and Bf7. With a firmly entrenched Knight on e5, Black would have a strategically won game.

23. Rad1 Ng4 24. Ba4

The only move. Now White will activate his Knight on f1.

24. ... Rf8 25. Nd2 Ne5 26. Bb3 Rd6??

Black retains an advantage with 26... f6, in order to meet 27. Nf3 with ... Bxc4. Now Black is lost!

27. Nf3 Nxf3 + 28. gxf3 f5

Else White would entomb the Bishop with e4-c4. And White wins on 28... Rg6 + 29. Kf2 Bf5 30. Rd5.

29. Rd2 Re8? 30. Kf2 f4

Black succeeds in rescuing the poor Bishop. Now 31. e4 Rd4 is quite tenable. But the ensuing King-and-pawn ending is hopeless.

31. exf4 Rxe1 32. Rxe1 Rd4! 33. Kf2
Kf7 34. Ke3 Bxc4 35. Rxd4 cxd4 + 36. Kxd4 Bxb3 37. axb3 Kf6

White wins the race easily if he continues with either [1] 38. Kc4 Kf5 39. Kxb4 Kc4 40. Ka5 Kxf4 31. Ka6 g5 42. b4 g4 43. b5 Kg2 44. b6 Ksh2 45. b7 g6 46. b8 = Q or [II] 38. Kc4 a5 39. Kb5 Kf5 40. Kxa5 Kxf4, with a similar conclusion.

38. Ke4? g6 39. h4??

White should play 39. Kd4 Kf5 40. Kc4 Kxd4 41. Kxb4 Kxf3 42. Ka5 g5 43. Kxa6 g4 44. b4 h5 45. b5 h4 46. b6 g3 47. hgx3 hxg3 48. h5 gxh5 49. b8 = Q g1 = Q, with a problematical Queen ending.

39. ... Ke6

Safer is 39... h6, to meet 40. f5 with ... 40. g5, with prospects for a draw.

40. f5 + gxf5 41. Kd4 Kd6 42. f4 Ke6? A simple draw would be 42... a5. No progress is possible after 43. h5 h6 44. Kc4 Ke6.

43. Kc5 a5 44. h5 Kf7 45. Kd5! Kf6
Or 45... Kg7 46. Kb6 Kf7 47. Kxf5 Kxh5 48. Ke6, and White Queens first.

27... Ncb7 28. Qd5 + Rf7 29. Qf3 Kh8 30. Bd5 Rd7 31. Kg2 Rb8 32. b4 f5 33. Be6 Re7 34. Re5 Ne7 35. Re3 Ndf6 36. Bb3 Ne4 37. Rxd3 Rd7 38. c4 Ne6 39. Re1 Nxd5 40. Rxd5 Rxd5 41. Qxd5 Qxd5 + 42. exd5 Nde6 43. Re6 Ne4 44. Re7 Ra8 45. d3 Nc3 46. d6 Nd5 47. Re5 Nf6 48. Rxf5 Rd8 49. Ra5 Rd7 50. d4 Ne4 51. Kf3 Nxd6 52. g4 Kg8 53. Rd5 Kf8 54. a4 Ke8 55. Rh5 h6 56. Rc5 Re7 57. d5 Ne4 58. Rd8 Kd8 59. d6 Nd2 + 60. Kf2 Re4 61. Rc7 Rxb4 62. Rxg7 Ra4 63. Rh7 Ne4 + 64. Kf3 Nxd6 65. Rxc7 Ke7 66. Rf1 + Ke6 67. f5 + Kd5 68. h4 Nc4 69. Rd7 + Kc6 70. Kg7 Ne5 + 71. Kg3 f5 72. h5 Kf6 73. b4 Ra3 + 74. Kg2 Ra2 + 75. Kg3 Ra3 + draw

Belle raised its score to 3-1, playing sharply, as Black, a computer version of an old opening favorite.

**QUEEN’S GAMBIT DECLINED**

**[D35]**

**Exchange Variation**

W: Chaos
B: Belle

5. d4 Nf6 6. Bg5


14. ... Ne4! 15. Bb6! Rd7 16. Ba5?

A time-waster that misplaces the Bishop to boot. Right is 16. Na3, when 16. ... Nd2 17. Rd1 is harmless, and 16. ... Rd8 17. Rad1 recovers White’s favor.

16. ... Be7 17. Nc3 Ne5

Probably better is 17. ... Nxc3 18. Bxc3 c5 19. Rad1 Qe6 20. f3 Rxd1 21. Qxd1 Qc5, with only a minute edge for White.

18. Qh4 Qd4 19. Rad1?

Better is 19. Ne2!

19. ... Nd3 20. Qa4

The Queenside is not a happy hunting ground.

20. ... Qg4

Here 20. ... c5! seems very strong as well, activating the Bishop. Also, 20. ... e5, to support the advanced Knight with ... e5-e4, is ok.

21. e5

Keeping the Bishop at b7 locked up, but exposing another weakness.

21. ... Qf5 22. b4?

The losing move. White must play 22. Qe4, giving up a pawn to stop Black’s threats. Then 22. ... Qxc5 23. Rxd3 Rxd3 24. Qxd3 Qxa5 25. Qd7 gives White just enough play for the pawn.

22. ... Nh2 23. Rxd7 Nxa4 24. Nxa4 Qc2 25. Rb7 Qxa4

The unfortunate position of White’s Bishop makes the game hopeless.

26. Ra1 e5! 27. f3 Qc2 28. Re7 Qd3 29. Rf1 Qd5 30. a3 g5

Black’s technique is rather bizarre; 30 ... a6, followed by ... f6, ... Re8, ... e5-e4, should win very easily.

31. Re7 f6 32. Re5 h5 33. h3 Kh8 34. Kh2 a6 35. Re1 Re8 36. Re4

Better chances are offered by 36. a4, in order to play b4-b5 at some point.

36. ... f5 37. Re2 g4 38. hxg4 fxg4 39. fxg4 hxg4 40. Rf2 e4 41. Rf7 Qc5+ 42. g3 e3 43. Rh7 + Kg8 44. b5 cxb5 45. Be1 Qb2 + 46. Kgl Qa1 47. Kg2 Qf6! 48. Kh2

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WORLD COMPUTER
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Rd8 49. Rhd7 Rf8
Black can win quickly with 49... Rdxd7 50. Rxd7 Qf1, but 49... Qxe5 loses.
50. Rd6 Qb2 + 51. Kg1 Qb1 52. Kh2 Qc2 + 53. Kg1 Qf5!, White resigns.

However, before that game was very far along, it became clear that Bebe was going to upset Nuchess. After a very drawn opening, Nuchess blundered with 16... Kh6?, whereas 16... f6 maintains equality. The game was soon hopelessly lost.

PETROFF’S DEFENSE

W: Bebe
B: Nuchess

With that result obvious, Cray Blitz’s programming team of Robert Hyatt, Bert Gower (both from the University of Southern Mississippi), and Harry Nelson [of Lawrence Livermore Laboratories] found themselves preserving over another portion of this year’s breakup of AT&T — Cray Blitz was winning! Being humans, they become exceedingly nervous as they got closer to clinching the world championship. They even went off to call Cray Research in Minnesota, the site of their computer, to have a backup computer available in case of any machine failure.

Finally, after much worry, it was over. At the awards luncheon, a fourth world computer champion was crowned. International Computer Chess Association President Donald Monroe Newborn presented the programming team with a beautiful piece of Steuben glass, and Dr. Botvinnik presented a gift to the victors — two Soviet Georgian drinking horns. (He explained that in Georgia, drinks are consumed in their entirety before they are put back down — hence the use of the horn instead of a glass.) Although he did not retain Belle's title, Ken Thompson was presented the 1983 Turner

Belle programmer Ken Thompson

ing Award and Software System Award for his outstanding accomplishments in the field of computer science, including the development of the UNIX Operating System and the programming language C.

The championship was sponsored by the Association for Computing Machinery, which holds the North American Computer Chess Championship at its conference each year. Assistance was provided by Texas Instruments, Control Data Corporation, SciSys, Hayden Software, Filedata Electronics, Ralph Wagner, Myron Szold, and the Baruch College Chess Club. Mike Valvo did his usual outstanding job as commentator [spelled occasionally by Boris Baczyński and Danny Kopech] and as tournament director (with assistance from Harold Bogner). Outgoing ICCA President Ben Mittman led the organization.

IMPROVE YOUR CHESS
CONTINUED FROM 40

W: Sensory Challenger 9
Level 5, 2 minutes per move
B: Joseph Donath
20 years out of practice
1. d4 b6 2. c4 c6

Joe wants to see what the computer will do when given a free hand in the center.
3. Bh4
All things being equal, most computer chess programs will choose the most mobile move. Here the Bishop attacks 11 squares (not including the one it is on), while 3. Bc4 would attack 10.
3... d6 4. Nc3 c6 5. Nf3
Taken out of its opening library early, the Challenger 9 continues to play classically. For beginners, this is instructive. The computer develops Knights to e3 and f3, and brings its Bishops out to c4 and f4 or b5 and g5. If it continues this classical development, it will castle early, link up its Rooks, and then look to develop some plan based on expanding its space in the center or the wings.

This general plan of opening playing will serve beginners well. But, of course, there’s more. Good development is fine, but good development with a plan in mind is essential. The computer lacks the ability to formulate long-range plans, and that’s what leads to its downfall — and to the downfall of many beginners as well.
5... Be7
Joe finally develops a piece, and he even has a “Bastmann” attacking idea with... g7-g5. [Michael Basman, an international master from England, regularly plays 1... g5 in international competition, but Joe didn’t know this.]
Joe would like to see how Challenger 9 will respond to this “naive” aggression. A human 1770 player, recognizing that these unrestrained Kingside pawn advances have weakened Black’s position, would play 10. exf5 gxf5 11. Ne2, with the plan of blocking the position and infiltrating via the dark squares.
10. exf5 exf5 11. 0-0? Bd6!
Moving his only developed piece again, but a good move for its “psychological effect” — that is, Black will learn more about his opponent.
12. f3??
This highly weakening move on the Kingside allows Black to get away with his opening experiment. Instead, 12. Ne2 is still indicated.
12... Qh4
After 12... f4? the computer is unlikely to consider the piece sacrifice 13. fxg4? Also well considering is 12... Bxh2 +.

For the purpose of this article, our opening experiment ends here. Black went on to win the game.

Of course, you should never play this way against a human opponent. Black got away with his experiment because he understood the peculiarities of his machine. The point to be learned here is that routinely following the rules of good opening play won’t automatically win any games for you, although they are a good foundation to build upon.

There are differences between quantitative and qualitative development. That is, it’s not important how many pieces you have developed, but how you have developed them.