

THE 15TH ACM NACCC ANATOMIZED

By FIDE Master Boris Baczyński

[Even though we published the game scores (Thompson) and a short report (Marsland) in Vol. 7, No. 4, the comments of FIDE master, Boris Baczyński, seem most worthy of including in this Journal. The chess-technical treatment of the games will provide the reader with information not often presented in such a fine amalgam of chess and computer chess. Its literary qualities cannot fail to commend it to all discerning readers.-Ed.]

XENARBOR'S MERIT

Xenarbor scored 0-4 to finish dead last in the Fifteenth North American Computer Chess Championship, held in conjunction with the annual meeting of the Association for Computing Machinery. Xenarbor was developed as a hobby by Donald Miller of Los Altos, CA. The luckless cellar dweller of the October tournament held in San Francisco, provided no evidence that it was one of the forward marchers in the effort to expand the horizons of machine chess. Nor was it any more successful when it tried to "improve" on the recommendations of chess theory. Its second-round game with Merlin, an Austrian program, stirred the spectators. Xenarbor, playing White, sacrificed a Queen for Rook and Knight in a variation of the Slav Defense, played as Black by former World Champion Vasily Smyslov. A few more moves in that game, the excitement died down as it became clear that Xenarbor, oblivious to whatever point its material investment had, was lost.

Still, Xenarbor's tournament participation was not meritless. It deserved a prize as the most appropriately named entry, if there had been such an award. The program's name combines Greek and Latin roots to mean "strange or alien tree", Miller explained.

THE CONTESTANTS

Strange indeed were the zillions of variations that the 14 entries, main frames and micros, generated during the four-round event. And the tournament's atmosphere seemed alien to the experts and masters of the San Jose Chess Club who serviced the demonstration boards. In the preliminary meeting, perennial computer chess tournament director and commentator International Master Michael Valvo reminded the programmers that their duties were confined to facilitating the game. "You are merely I-O (Input-Output) devices for the computers," the impresario said.

Actually, the human facilitators do more during the yearly tournament than enter and extract moves. The event provides a forum for an exchange of ideas among the leading personalities of the field. Also in attendance is the dank odor of ambition that characterizes human tournaments. The research programs have points to prove, while the commercial entries are fighting for the very real advantage that good results offer as grist for their advertisements.

The unquestioned guru of this coterie is Ken Thompson, who, along with Joe Condon, developed Belle, the machine that ruled computer chess during 1978-1983. His comrade-competitors felt awed by the genius of the casual, T-shirted Father of Belle, whose electronic sinews seem especially constructed only to play chess. He was the main developer of the UNIX operating system. The quiet-spoken Thompson is also respected as a prodigious worker; it is

THE WORLD CHAMPION - A MACHINE?!

Prospects for an artificial world champion are an inevitable topic at any machine-chess conclave. Everybody brightly assumes that a non-human champion is inevitable; opinions only vary as to when.

Monty Newborn, President of the ICCA, Chairman of the ACM Computer Chess Committee and programmer of Ostrich, offers an assessment most optimistic for the champions of machine chess. Extrapolating from the Elo-rating advances made by computers in the 30-year history of the field, Newborn expects that a computer will be crowned world champion "in five or six years".

Others, designers of more powerful programs than Ostrich, foresee a more arduous approach towards that goal. Hyatt cited IGM Robert Byrne's opinion that Cray Blitz's tactics are on the 2600 level, but expressed no more than a "hope" that a computer would ascend the Mount Olympus before the year 2000.

Thompson said that this will happen in '20 to 50 years'. While a bit vague, his view has added weight because it is offered from the perspective of a person whose creation, Belle, has already bested human efforts in one branch of the game: pawn-less endings. Utilizing symmetrical tables, Thompson has constructed data bases which perfectly conduct endgames such as King and Queen vs. King and Rook. More recently, Thompson said, study of the King, Rook and Bishop vs King and Rook endgame prompted him to dispute the 50-move draw rule. The computer found instances of that ending in which 59 moves are required, with best play, to force a win.

Belle has found other analytical labors more frustrating. It attempted to improve on Gary Kasparov's play in the 6th game of his first World Championship Match against Anatoly Karpov. Thompson says his computer found 'many optimistic moves, but no forced win'. Many qualified commentators thought Kasparov held a winning advantage in this game clash, which Karpov eventually won.

Scherzer voiced an agnostic view, 'I am not sure what the target is. 700 points (the rating difference between the World Champion and the top programs) - what does it mean?' He pointed out one possible path of progress, 'The programs are creating data at phenomenal speeds. Some day we will have to examine the question of how to use computers to analyze these data.'

Opinions are fine, but in chess it is only the moves that truly speak. Examining some of the thousands of moves that computers played in San Francisco, the reader can form his (or her) own opinion of how near - or far - computers are from ascending the throne of the World Chess Champion.

ROUND 1

Cray Blitz punched out the first mark on the tournament crosstable with a merciless pounding of Fidelity X. Of course, it was as much of a mis-match as a fight between a world heavyweight contender and a dwarf. Still, as we shall see, the game's first error was that of a human, not of the machine.

Cray Blitz - Fidelity X
(B21)

1. e4 c5 2. d4 cxd4 3. Nf3

The game is long past reasonable, but this move might surprise anyone whose horizons do not extend beyond human chess. 'Aware' that 20. Bc5 allows 21. Nd6 checkmate, and that 20. Nc6 leads to 21. Rxc6+ dxc6 22. Qxc6+ Kd8 23. Qc7+ Ke8 24. Nf6 checkmate, Fidelity indulges in a typical computer attempt to "extend the struggle".

21. Rxc4+ Qc5 22. Qxf8+ Kb7 23. Rxc5 bxc5 24. Qxc5 Nc6
25. Nd6+ Kb8 26. Qb5 checkmate.

In the round's other noteworthy action, Phoenix, programmed at the University of Alberta in Canada, pulled a mild upset by holding Belle to a draw. That game began 1. d4 d5 2. Bg5 f6 3. Bf4 Nc6 4. Nf3 g5, and Belle, playing Black, duplicated a position it had had several times before, against both man and machine. Strange are some of the byways of opening theory that spring up in computer chess.

In Awit-Bebe, Black for reasons unfathomable to a chess mind, doubled Rooks on the unopened a-file. Awit promptly provided the rationale for its opponent's play by unnecessarily pushing the b-Pawn to allow Bebe a half-open file. Its strange play justified, Bebe took only a few more moves to win White's anemic a-Pawn.

Nuchess-Novag X was another type of common computer game. Machines just love to resolve tension by chopping wood. Massive early exchanges led to a Rook-and-Pawn ending in which neither side could make progress. The draw was a creditable result for Novag.

ROUND 2

The highlight of this round was the Belle-Nuchess clash. It provides an excellent illustration of both strengths and weaknesses of the leading contemporary programs.

Belle - Nuchess
(B22)

1. e4 c5 2. c3

The Alapin variation is a regular Belle reaction to the Sicilian Defense. This is an excellent choice for computer play as it tends to lead to more open play than other Sicilian lines.

2. e6

More common are 2. d5 and 2. Nf6, but maybe Nuchess prefers to avoid theoretical disputes with Belle.

3. d4 cxd4 4. cxd4 d5 5. Bd3?!

Exposes the Bishop prematurely; better is 5. e5, transposing into a variation of the French Defense.

5. dxe4 6. Bxe4 Nf6 7. Bc2 Nc6 8. Nf3 b6?!

Humans would prefer 8. Be7 9. 0-0 0-0 10. Nc3 b6 with Black perhaps a smidgen better than he usually is in this typical isolated d-Pawn position. But, then machines do not know the typical patterns ...

A key error. Granting Black a passed Pawn has nothing in common with increasing the scope of White's Queen. The passed Pawn now increases in strength until it decides the game. Correct is 20. Rcl Rac8 21. Qe2 with White winning the struggle for control of c4-square, with a prospect of eventually dominating the c-file.

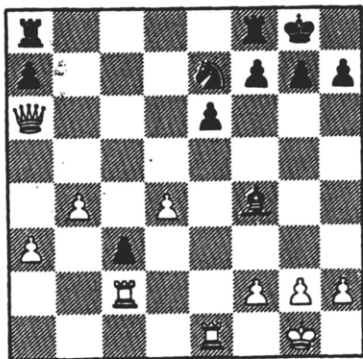
After the game, Thompson was asked how he would remedy Belle's lapses in this game. 'I don't know what to do to solve this', he answered, 'except to discount the value of the Queen against two pieces. But, then it might give the Queen away (foolishly) in an opposing position.'

With all due respect, the response neglected to touch on the central computer failure exposed by Belle's performance in this game, i.e., goal-lessness of play when the payoffs are beyond the lookahead of its tactical range. Here Belle probably exchanged Bishops under the guidance of the common principle that exchanges are favorable for the side materially ahead. Although usually sound, this rule, as nearly all chess maxims, has its exceptions. And it is those exceptions that can make life very frustrating for programmers of chess computers.

20. bxc4 21. Rcl Rac8 22. Qe2 c3 23. Qa6 Bf4
24. Rc2 Ra8?

The natural, human move is 24. Rc7. Nuchess is relying on a "trap".

25. Qb7?



This merely drives the black Knight to its best square. Belle should have "fallen for the cheapo" by giving back a bit of material to eliminate the nettlesome Pawn by 25. Rxc3 Bd2 26. Recl Bxc3 27. Rxc3 resulting in a position which still could be driven in for the full point, e.g., 27. Rfd8 28. Rc7 Rxd4 29. g3, and White is infiltrating, while holding in reserve the prospect of a passed Pawn on the Queen-side.

Position after 24. ... Ra8?

Few experienced chess-players would fail to find this method. However, Belle is hamstrung by its compulsion to render homage at the altar of material, and continues its downward drift.

25. Nd5 26. Ree2?!

An arcane move, whose rationale is deeply buried in the dense circuitry of Belle's evaluation function. More useful is 26. g3, making luft for the King and harassing the black Bishop.

26. Bd2? 27. Qa6?

The proper move, of course, is 27. R(any)xd2, but both machines are prisoners of their materialism. The cascade of errors continues

27. g6? 28. Re4? Rfc8 29. Kh1? Rf8? 30. Rh4?

Center Counter, with which it had lost at least a couple of games during the last year. It lost again, and Newborn acknowledged that his program's opening book needs work.

ROUND 3

Only Cray Blitz and Bebe had perfect scores going into this round. They clashed. Bebe set up an inferior defense, neglecting its development. Cray's winning procedure was precise and powerful.

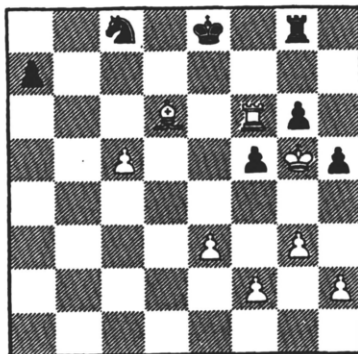
In Merlin-Chaos, White quickly gained a decisive material advantage, but then proceeded to drag the game on and on. The tide turned in the deep end-game, and Chaos notched a point. Xenarbor lived up to its name by playing into the tournament's most ridiculous position against Ostrich. For 32 moves its Queen Rook and Queen Bishop, hemmed in by its own pawns at b7 and d7, did not stir from their initial squares. Then both pieces disappeared from the board, victims of a three-move Ostrich combination, which led into a Knight and Pawn ending in which Ostrich had the only Knight.

ROUND 4

Going into the last round, Cray Blitz had the tournament's only perfect score. It was paired with Nuchess, whose two points included two draws. During most of the game, it seemed as if Nuchess would win, forcing a massive tie for first place.

Nuchess - Cray Blitz
(A21)

After 44 moves (see Vol. 7, No. 4, p. 214) the following position was found on the board.



Position after 44. ... Nc8

While Nuchess has hardly produced an immortal gem of chess, its performance so far has been fairly thematic - for a computer. White is up a Pawn, but an even more important factor in its favor is the superior activity of all three of its pieces. One good move is 45. Kh6, threatening to trap the black Rook with 46. Kh7. Another approach toward a win is 45. Be5, and the threat of 46. Rxd6 forces 46. ... Ne7, after which White shifts the Rook by 47. Ra6, and Black has to lose more material. Instead, Nuchess played

45. Rxd6??

This is the move which turned a win into a loss, and allowed Cray to clinch its undisputed first. White wins a second Pawn, but in the coming Pawn ending its material edge is worthless as the white King is too far removed to cope with Black's lone, but distant passed a-Pawn. William Blanchard of the Nuchess team dejectedly confirmed that this program failed to include the