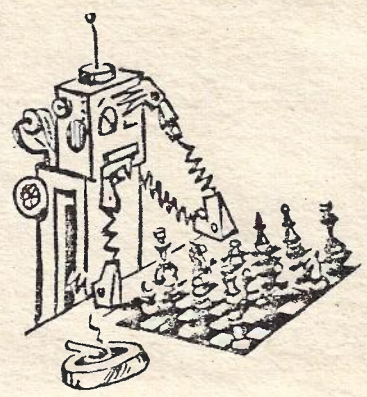
You can be tinny and still lose



ARE COMPUTERS better than human beings at chess? Many people are surprised to learn that the answer is a very definite no.

Computers can beat weaker players but the best programme in existence today would probably come last in a 12-player New Zealand championship. David Levy, Scottish International Master and controller of the World Computer Chess Championships has wagered £1250 that no computer will beat him by 1978.

Levy is the author of a new Batsford book, *Chess and Computers*, which explains in simple language how computers play chess and the difficulties encountered by programmers. Only the moves of chess need be known to understand his explanations.

The most common method computers use to select moves is based on material values and mobility. The programme tries to avoid losing material and will always accept a sacrifice.

Mobility is defined as the number of legal moves it has in the position and the programme will choose the continuation that increases its number of legal moves, thus increasing its mobility.

For example, 1, e4 increases mobility from 20 to 30 possible moves, while 1, b3 from 20 to only 21. A computer would prefer 1, e4.

Computers analyse within "ply depths" (one half move each). Within this depth they are deadly accurate, but they cannot see any deeper. Levy explains this in his book with the following simple example.

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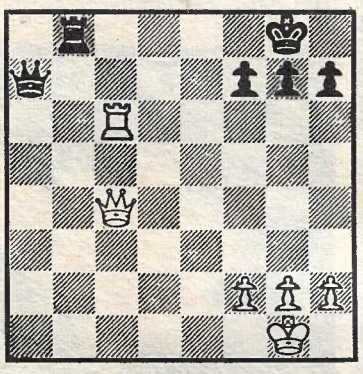

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In this position any human player would play 1, Rc8 ch R×c8. 2, Q×c8 checkmate. But a programme playing on a fixed depth search of two would only "see" 1, Rc8 ch R×c8. It would assess the line as losing a rook and discard it.

KAISSA

The world computer champion KAISSA has the research of the whole Soviet Union behind it, led by former world champion Mikhail Botvinnik. In 1972 KAISSA played the readers of the newspaper *Komsomolskaya Pravda* in two games, ending up with a draw and a loss. This was no mean feat as the previous year Spassky had scored a win and a draw against the readers.

Moves were published most Sundays and readers would then send in their next move — the one used being that suggested by the majority of readers.

KAISSA's look ahead was set at 7-ply but this was able to be extended if a variation involved captures or forcing moves.

KAISSA v readers

First game

1.	e4	c5
2.	Nc3	

Forty minutes thought and more than 500,000 positions examined.

2.	. . .	Nc6
3.	Nf3	d6
4.	Bb5	Bd7
5.	O-O	g6
6.	d4	c×d4
7.	B×c6	d×c3
8.	B×b7	Rb8
9.	Bd5	Bg7

(9 . . . c×b2. 10, B×b2 R×b2. 11, Qd4).

10.	b3	Nf6
11.	Be3	

A total of 1,500,000 positions examined on that move!

11.	. . .	Qc7
12.	Qd4	a5
13.	Bc4	O-O
14.	R(a)e1	Bc6
15.	e5	B×f3
16.	e×d6	e×d6
17.	g×f3	Nh5
18.	Qd3	Be5
19.	Bd4	Kg7
20.	Re3	

KAISSA predicted 20 . . . f6. 21, B×c3 B×h2 ch. 22, K×h2 d5 dis ch. 23, Be5 but changed its mind.

20.	. . .	f6
21.	R(f)e1	Nf4
22.	Q×c3	R(b)c8
23.	a4	Qd7
24.	B×e5	f×e5
25.	Kh1	Qh3
26.	Rg1	Nd5
27.	Q×a5	Rc5
28.	Qa7 ch	Rc7
29.	Qa5	Rc5
30.	Qa7 ch	Rf7
31.	Q×c5	d×c5
32.	B×d5	Rf4
33.	R×e5	R×f3
34.	B×f3	Q×f3 ch
35.	Rg2	Draw.

The readers must take the perpetual 35 . . . Qd1 ch. 36, Rg1 Qf3 ch.

* * *

The big problem that lies ahead for programmers must be how to make computers select good candidate moves. Computers at this stage are forced to examine every line, every possibility and this can never succeed. (For those who disagree: limit the game to 40 moves and the number of candidate moves to only 30, make every atom in the universe a computer and have them all working together trying to play the perfect game. Many millions of years later the first move will not have been played. The reason — simply that the 10^{120} possibilities are far greater than the number of atoms!)

A human player chooses several candidate moves by intuition, among other things. Can this be translated into a programme? President of FIDE, the international chess federation, Dr Max Euwe, is doubtful, as are many others including former world champion Mikhail Tal.

I thing computer chess has the scope and challenge for exciting new discoveries in the future. But, as Levy ends his book, for the moment at least, man is still master over computer.

MURRAY CHANDLER