

There was a time when computer programs had absolutely no strategic chess understanding. During the 1970s, the larger computer programs, running on computers that cost up to several million dollars, began to exhibit a measure of positional understanding, but only when searching trees that contained 100,000 or more positions. Our aim with "Philidor" was to enable it to understand the strategic requirements of a chess position, even when it has only a few seconds for its moves.

To achieve this aim we introduced a totally new concept into chess programming. This concept is one of the industrial secrets of our trade which we are not, at the present time, at liberty to describe or discuss.

We thought this concept was working quite well and we got some delightful confirmation when Kevin gave some German computer chess journalists a sneak preview of "Philidor" during the Nürnberg fair at the beginning of February 1981. Bjorn Schwarz and Iwan Kuhnmond were the first "outsiders" who had the opportunity to sit and play against it. Kuhnmond is a strong player. He eventually won, not without difficulty, and at the end of the game he described "Philidor" as "the first chess program ever with an understanding of basic strategic principles". Schwarz interjected to point out that Kuhnmond was speaking only of micros and surely some big mainframe computer programs had some strategic understanding, but no, Kuhnmond insisted that "Philidor" was the first chess program of any type to be gifted in this way.

The next game was played on board 2 in the fourth round of the 1981 Asian Cities' Team Championships in Hong Kong. A team of "Philidors" was invited to take part, and the company which will make "Philidor" available as a stand-alone computer (Scisys-W, Ltd., of Hong Kong) helped to sponsor the tournament.

Before we went to Hong Kong, many sceptics tried to persuade us that it was foolish to enter such an event with a team of chess programs running on microprocessors. Basing their assertions on the games that they had seen by other commercial chess computers, they predicted that we would probably lose

every game. In fact "Philidor" scored two draws and five wins out of 26 games against the strongest players in Asia. Its performance rating for this event was 1860, an advance of 140 Elo points in 2½ months.

F. Takahashi (Tokyo) is rated about 1900. The notes are by David Levy.

Modern Benoni

Takahashi White "Philidor" Black
 1 P-Q4 N-KB3 2 P-QB4 P-B4 3 P-Q5 P-K3 4 N-QB3 PxP 5 PxP P-Q3 6 N-B3 P-KN3 7 P-KN3 B-N5 8 B-N2 QN-Q2 9 O-O R-QN1 10 P-QR4 P-QR3

"Philidor" is doing all the things recommended in Hartston's book on the Modern Benoni yet it has been out of its own openings book since move 7!

11 P-R5	P-N3
12 P x P	R x P
13 Q-Q3	B x N

Not strictly necessary at this point, but in similar positions Black's bishop is less useful than White's knight on KB3, so the trade normally helps Black.

14 QxB B-N2 15 P-K4 O-O 16 Q-K2 Q-B1 17 R-K1 N-K1 18 B-R3 BxN 19 PxN N(K1)-B3 20 B-R6 R-K1 21 Q-B3

Although White has the advantage of two bishops for two knights, there is nothing useful for the bishops to do.

21 ...	P-B5!
22 B-N5	N-K4
23 Q-N2	N(B3)-N5
24 B x N	Q x B

Now White discovers that his white-square weaknesses are going to cost him material.

25 B-K3	N-B6ch
26 Q x N	

Relatively best.

26 ...	Q x Q
27 B x R	Q x QBP
28 KR-QB1	Q-N7

So that White cannot capture either the QRP or the QBP.

29 R(B1)-N1 Q-B7 30 R-QB1 QxKP 31 R x RP QxP 32 B-K3 Q-Q6 33 R-B6 P-Q4 34 R-B7 P-Q5.

Short of time, Black missed the quickest win: 34 ... RxB 35 PxR QxPch.

35 B-R6 P-B6 36 R-R1 Q-B6 37 R-QB1 Q-R4 38 B-B4 P-N4 39 R-B5 P-B3 40 P-R4 P-Q6!

Now 41 R(B1)xP would lose to 41 ... Q-B6, threatening both 42 ... PxP and 42 ... R-K8ch.

41 R(B5)xBP PxP 42 RxP PxP 43 PxP Q-K7 44 R(Q3)-QB3 P-B4:

Now 45 ... P-B5 is the threat, and if 46 PxP then 46 ... Q-N5ch followed by picking up the remaining white pawns.

45 R(B3)-B2 Q-B6 46 R-B3 Q-N5 47 K-B1 P-B5! 48 PxP QxRp 49 B5 QxPch 50 K-N1 Q-Q7 51 B1 R-KB1ch 52 K-N1 Q-K6ch 53 K-N2 R-B7ch 54 K-R1 Q-KR6ch 55 K-N1 Q-N7 mate.

A number of the Hong Kong games had indicated weaknesses which we wanted to eradicate, and so David Broughton and his colleagues made a number of changes when we returned to London in March 1980 (by now there were six programmers who had devoted some of their time to the project). These changes resulted in further test games, and in various versions of the program being tested against other versions, just to see which ideas worked best in a competitive environment. At one stage we had several prototype computers wandering around the world being demonstrated at consumer exhibitions and to computer chess enthusiasts. Though some of these machines contained bugs in the program the general opinion of the performance of "Philidor" was "outstanding".

Perhaps the most impressive result obtained by the program, was in a friendly game played against BELLE, the current World Computer Champion, at a computer chess conference in London on April 10th. Those of you who have read about BELLE will know that it runs on specially designed hardware and that it has an enormous openings library on disc. The version which its programmer, Ken Thompson, brought to London, did not have the large disc and so its openings book was much smaller than usual; also it lacked the ability to set up transposition tables which are very useful to it, particularly in the endgame. So "Philidor" was not

playing against the very strongest version of BELLE. Nevertheless, Ken Thompson did not expect "Philidor" to have any chance at all. (Notes by David Levy).

"Philidor" (90 seconds per move) White; "BELLE" (45 seconds per move - to compensate for "Philidor" running on hardware that was half the speed of the production version.) Black

Centre Game

1 P-K4 P-K4 2 P-Q4 PxP 3 QxP N-QB3 4 Q-K3 N-B3 5 B-Q2!

A move overlooked by many theoreticians which makes this whole opening quite playable for White. The point of the move is to delay N-QB3 for a moment, so that Black cannot benefit from the pin ... B-N5.

5 ... N-KN5 6 Q-KN3 P-KR4 7 N-QB3 B-B4 8 N-R3 P-Q3 9 O-O-O P-R5 10 Q-B4 B-K3 11 B-Q3 B-Q5 12 N-Q5 B-K4 13 Q-N5 N x RP?? 14 P-KB4! QxQ 15 N x Q B x N 16 KPxB N-N5 17 PxP NxBch 18 PxN N-N5 19 P-K6 N-B7 20 NxP R-R4 21 B-N5 P-R4 22 P-KN4! R-KR2 23 RxP RxR 24 BxR N x R 25 K x N P-R5 26 P-N4 PxP e.p. 27 PxP R-R4 28 K-K2 RxP 29 B-Q8! R-QB4 30 P-Q4 R-Q4 31 BxP K-K2 32 NxP!

White either emerges with a won pawn ending or with a safe passed pawn after 32 ... KxP 33 NxP; but not 32 ... RxP? 33 N-B5ch.

32 ... RxN 33 BxRch KxB 34 P-Q5. Black resigned on move 40.

We have now finished work on the first "public" version of "Philidor", and it will go on sale in Scisys' "CHESS CHAMPION MK V" computer, which will be available in September. This machine has been made as a modular system, so that when stronger versions of the program become available, anyone who has bought the original machine will be able to replace his module with a new one. The playing strength of the program is now around 1900, perhaps slightly higher. But rather than be content to rest on our laurels we are already working towards "Philidor 2".

Now turn over for an entirely different development.

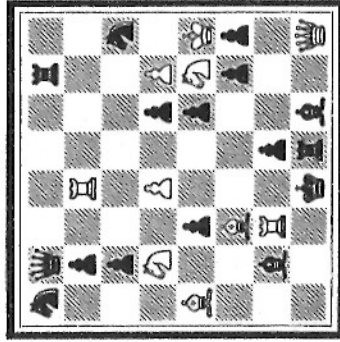
Although most serious chess players are not usually interested in chess problems, there does seem to be a growing interest in the problemists' art, and computers can actually help by determining whether or not a problem is "cooked" (i.e. has more than one solution). For this reason we decided to

teach "Philidor" how to solve mate problems.

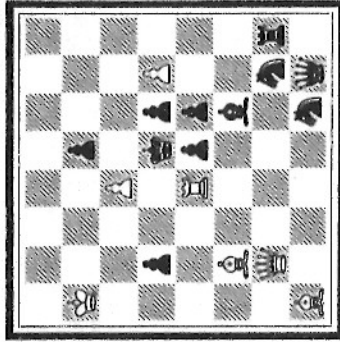
We took ten "White to play and mate in two" problems which Capablanca once solved in a timed test. These problems were published in the *British Chess Magazine* in 1916 (pages 29-30 and 110-111). Capablanca solved all

ten in 21 minutes, which is not bad going for a future World Champion. "Philidor" found the correct solutions in a total of 1 minute 25 seconds! Since this test took place, "Philidor" has been speeded up by some 20%.

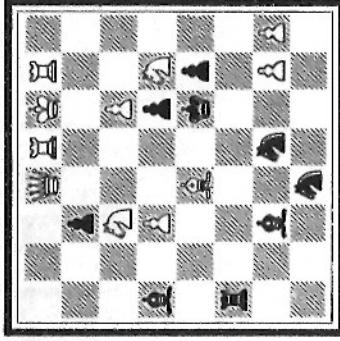
Here are eight of the problems. How long do YOU take to solve them?



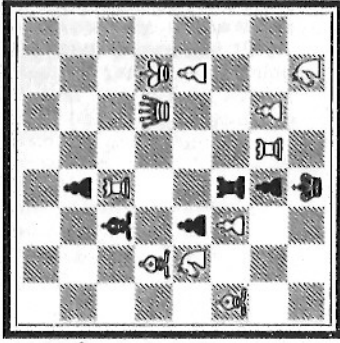
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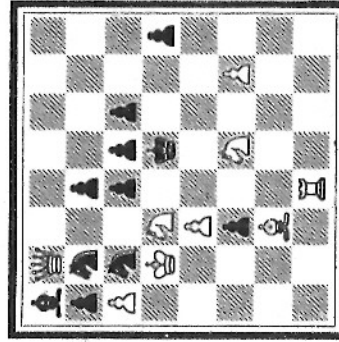
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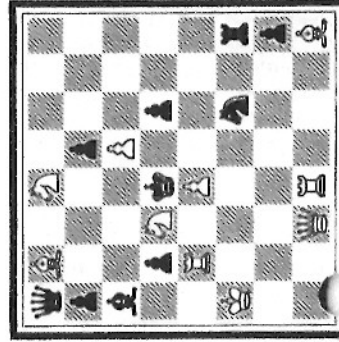
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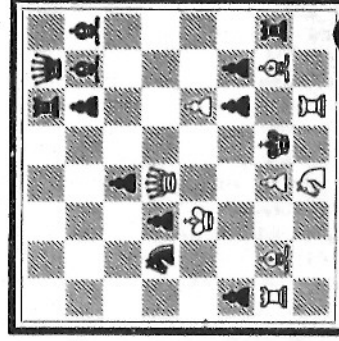
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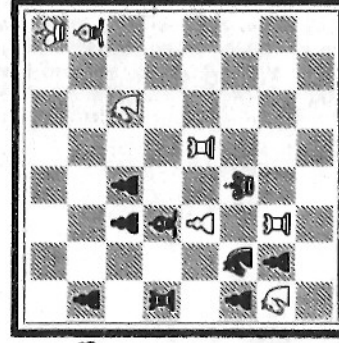
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Solutions: p. 135.

China's women's sensational debut by Xu Jialiang, former champion of China

The Chinese women's team, making its first international chess appearance at the Olympiad in Malta, caught the attention of the chess world by sharing fifth place out of 42, level with West Germany.

Composed of four girls averaging 19 years of age, they drew their matches with the U.S.S.R. (repeatedly world champions), Romania, Yugoslavia, England and Spain and defeated Bulgaria, Sweden, Canada, India and Japan, scoring 24 points out of a possible 42.

Western chess, like the Chinese chess or "xiangqi", was not officially sponsored as a competitive sport in China until 1956. Until then, the game had been restricted to a very few people in big cities where there was a strong foreign influence. There have always been far fewer women players than men and it was not until 1978 that a national women's Western chess tournament was organised.

No member of the team at Malta had played the game for more than six years. None had any international title. Only Liu Shilan had an Elo rating of 1930, and she acquitted herself well. Among her 14 opponents there were three grand masters and seven international masters. Against the G.M.'s she scored one win, one draw and one loss, and against the I.M.'s three wins, three draws, one loss.

Her best performances were to humble noted Bulgarian G.M. Lemachko in an endgame and draw with the reigning world champion Chiburdanidze.

A student of history at Sichuan University in south west China, she is a pretty, demure lass. She began to learn chess at 12 at a spare-time sports school for children in Chengdu, capital of Sichuan Province. She studied hard. After a loss she used to spend a lot of time finding out why, and where she could have done better. She was among the top six placers in the national junior tournament in 1976, beating several strong boy players. Two years later she finished first, taking the title, and later won the national ladies' title twice.

In May 1979, in her first competition abroad, she teamed up with I.M. D. Vulovic *Yugoslavia* to win the women's team tournament of 33 teams at the Pula Chess Festival in Belgrade. This created a sensation in the European chess world, her team winning all the five matches they played.

A month later in Belgrade, she beat a former Hungarian national champion and several leading Yugoslav players.

The Hyères club in France invited Liu and another young Chinese player, Wu Minqian, to compete in their fourth International Women's Tournament. Liu drew with Soviet G.M. Fatalibekova and Yugoslav G.M. Stadler and defeated the Romanian I.M. Polihroniade. She finished third with 8½ points out of 11. There were 48 entrants from 21 countries. The French press called her a "rising star".

In three international tournaments in 1980, she scored W1, D4, L1 against G.M.s, and W6, D5, L3 against I.M.s.

Her Elo rating stood at 2045 in the F.I.D.E. list of January 1. Her results at Hyères, Malta and Novi Sad qualify her as an I.M.

Wu Minqian's record at the Olympiad was W5, D5, L4. She drew with the Soviet G.M. Gaprindashvili, former world champion, and Hungarian G.M. Ivanka.

As a child Wu learned chess from her father, who came fourth in the 1958 national championships and is now a chess coach at a spare-time sports school for children in Hangzhou city, East China. At 13, in 1974, she learned chess at a spare-time sports school for children, practising the game on her father in the evening after finishing her homework. She studied hard and made remarkable progress. Her play is marked by boldness and an aggressive spirit.

Her Elo rating now stands at 1975.

Seventeen-year-old An Yanfeng, a middle school student in the north China city of Taiyuan, is the youngest on her team. A lively girl, she constantly wears a sweet smile on her face while talking