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MAGIC GAMES AND CHESS

Magic has been a dominating factor for centuries. Some have used it for their health, others as a source of inspiration. The arrival of the digital computer, a magic phenomenon in itself, has caused a diverging of opinions on its capabilities, in particular after Shannon's (1950) article *Programming a Computer for Playing Chess*. For some it was unbelievable that a computer could play chess at all, let alone at an acceptable level, and certainly not at Grandmaster level or, even stronger, above the level of World Champion.

Chess was a magic game, full of intricacies, with its own world. Many authors of chess studies or composers of chess problems have tried to sublimate the practical findings of Grandmasters. Frequently they succeeded in glorifying compositions, which excelled in beauty and simplicity. A superb instance is Réti's (1921) KPKP study.

Currently computer programs are surpassing the world-top chess players. Instances of this process are Kasparov's (1997) defeat against DEEP BLUE, and Anand's (1998) mixed contest against REBEL, reported in this issue. Does this mean that the magic of chess has been unravelled? No, since solving the game is beyond our reach, the magic remains and the investigations will continue.

Nevertheless, we see that researchers are widening their scope of examination. Three distinct amplifications of research are worth mentioning: (1) thorough investigation into the fundamentals of the concept *strategy*, (2) further development of chess-like games, and (3) profound study of metagames.

This issue of the *ICCA Journal* illustrates all three lines of research. First, the program REBEL showed in its 8th game against Anand that it definitely needs some strategic guidelines in order to understand an unbalanced position. Moreover, Van Reek *et al.* argue that strategy can be calculated by a planning machine when containing the appropriate determinants of tactics and positional play, provided that the machine can reach a sufficiently deep level of search.

Second, the development of chess-like games is extensively discussed by Coplan, using a special board and a special concept of promotion: a Bishop may promote to a Rook, and a Rook to a Bishop. In addition, the gap between strategy and chess-like games is bridged by a report on the 4th FOST-Cup World Computer-Go Championships.

Third, the next challenge of computer-chess research is closely linked up with the understanding of the secrets of an arbitrarily-specified game. Playing these so-called metagames at an acceptable level requires a kind of interpretation which is at a par of adequate language understanding. Hence, we welcome Jacques Pitrat's contribution as an encouragement to deepen research in this direction.

Considering the development of our research in the 20th century we see the following evolution: from mathematics to computer science to games to chess. Having reached a position of equal footing with human performances in chess we are now retracing the evolutionary footpath, with magic transformed into bits and bytes. In the end we will arrive at mathematics and will have revealed its own magic.

Recently, a first sign of solving complex computer puzzles in that area has been published, viz. on most-perfect pandiagonal magic squares[1]. The construction is to be regarded as a metagame in mathematics. The authors are worth being introduced. Dame Kathleen Ollerenshaw, born in 1912, has been a great admirer of H.G. Hardy all throughout her life. David Brée was a Ph.D. student of H.A. Simon. So, the idea of a General Problem Solver has come to life again. The future will reassess its value.

Jaap van den Herik

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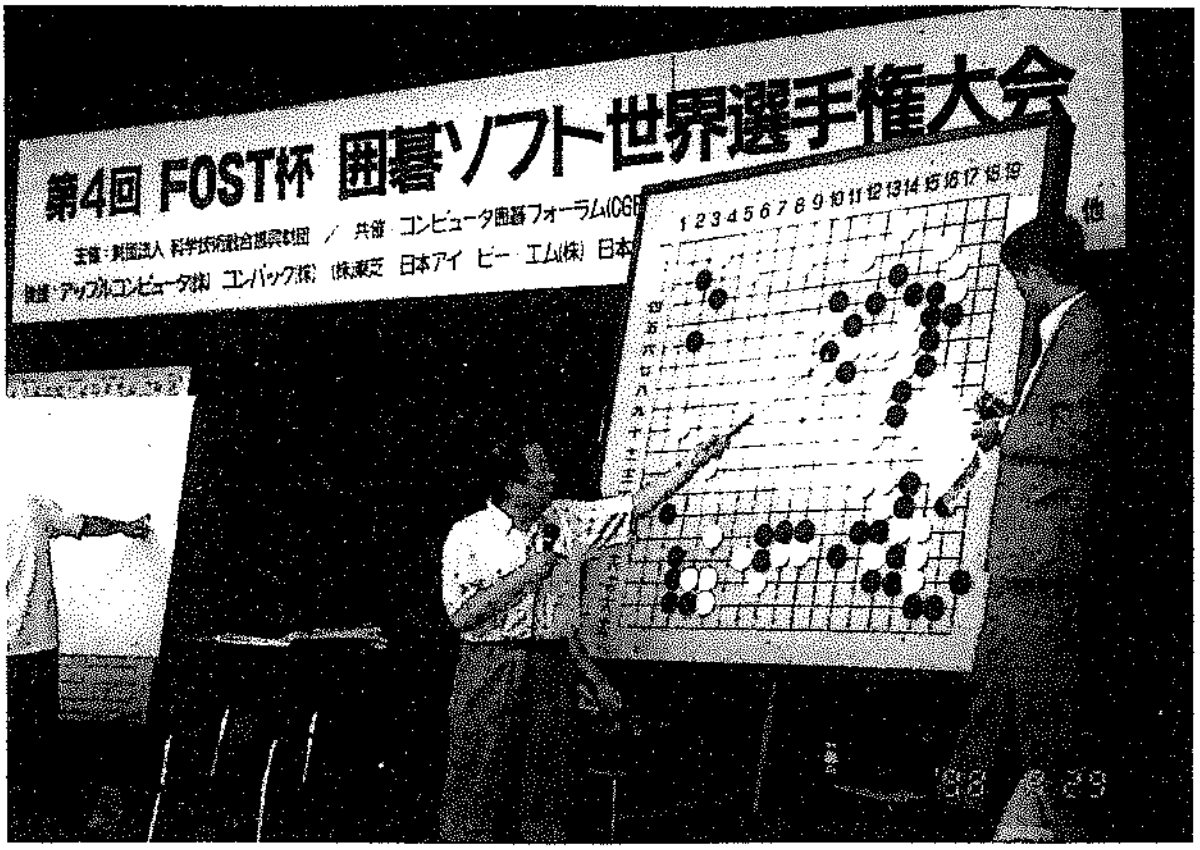

Photo by courtesy of A. Yoshikawa and H. Iida.

GO FOR MAGIC, GO FOR STRATEGY.
Showing possible actions at a demonstration board at the 4th FOST-Cup World-Open Computer-Go Championships, Tokyo, Japan, August 28-29, 1998.

[1] **Reference:** Ollerenshaw, K. and Brée, D. (1998). *Most-perfect pandiagonal magic squares. Their construction and enumeration*. The Institute of Mathematics and its Applications, Southend-on-Sea, Essex, SS1 1EF, UK. ISBN 0-905091-06X.