Computers, Chess, and Long-Range Planning, by M. M. Botvinnik. xiii + 89 pages. Springer-Verlag, New York, 1970.

This book is essentially an analysis of chess with a view to developing a computer program which is a 'first-class" chess player. The "self-teaching machine" approach is discarded by the author in favour of a solution by means of duplication of human thought processes. (The author, world champion for 13 years, is certainly knowledgeable in this area.) The development of a solution requires certain concepts of planning which may be very widely applicable. A program based on the algorithm set forth in the book is currently being written; its success will be a test, not only of Botvinnik's theories of chess, but also of his hypotheses regarding long-range planning.

In 1950, Shannon outlined two possible approaches to the computerized solution of chess; firstly, by the construction of all possible variations of all possible moves to some given depth (horizon) and the evaluation of each resulting position, or secondly, by recognizing that some moves are fruitless and therefore excluding them from consideration, thus increasing the horizon of computation for those moves which are most promising. To date the most successful chess programs have been based on the first approach, and those attempting to follow the second have been failures as chess players. The author concludes that new techniques for separating useful from useless moves must be developed for the variable horizon approach to be successful. This is accomplished through the introduction and formalization of several concepts of planning in chess. The algorithm thus developed is dependent on a particular way of recognizing permissible moves, which is subsequently described in the book. Finally, an example demonstrating the power of the algorithm is worked out.

Unfortunately the notation of the book, both mathematical and chess, is rather difficult; the appendices are of some assistance in this regard. However, the knowledge of chess, mathematics, and programming required for an appreciation of the book are minimal. The book should therefore be of interest to many serious students of chess; as well, it may throw some new light onto certain difficult areas of systems analysis. In addition, the work may be instrumental in the development of the field of long-range planning—it is to be hoped that new work will be encouraged in this area.

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