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Letters

Calculations in chess, checkers

In "Computer Chess: A Masterful Lesson" (SN: 10/28/89, p.276), chess guru Gary Kasparov betrays his ignorance of elementary mathematics by claiming that good chess "transcends logic and calculation." In fact, it has been known for quite some time that at every point during a chess match, there exists a finite, optimal set of moves for each player.

Chess, like tic-tac-toe, is known in the literature of game theory as a "solvable" game. The advantage in chess *initially* belongs to white, who moves first. This fact is not at all obvious, even to the most seasoned players. The actual calculation of an optimal strategy involves the enumeration and comparison of an enormous number of different configurations on the board. However, just as a computer can multiply and divide many times faster than a person, it can also count and compare different configurations more quickly — and hence, if armed with enough capacity, it theoretically can outwit any human player.

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Cover: After years of delay, NASA plans to launch the Hubble Space Telescope this March 26. Though the orbiting telescope has unprecedented resolving power and will capture ultraviolet images impossible to obtain from Earth, scientists worry that aging equipment, inefficient software and other setbacks have made the \$2 million instrument less valuable than they had hoped (Illustration: NASA)



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Being capable of rapid calculations, computers are not only debunking myths about pastimes like chess but also creating new sciences in which researchers exploit the computer's capability of sorting through combinatorial problems like chess. Try the classic "Traveling Salesman Problem": Find the minimum distance needed to travel in order to visit all of a finite number of cities connected by a finite network of roads joining all the cities. As the number of cities increases, this problem proves to be a most complex one, much more so than chess.

Kasparov's comment can now be adduced as evidence that innumeracy — the lack of knowledge of basic math — extends far beyond U.S. shores to plague the best and brightest in other lands as well.

Michael Lee Jacobs
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Your computer chess article has the virtue of not repeating the myth that the problem of

computer checkers was trivial and solved long ago. It is not generally understood outside the serious checker-playing community that computer checkers is less successful than computer chess in terms of play against master players. This misunderstanding traces to overestimation by A.L. Samuel (who pioneered checker programs) of the level of human play encountered by his early computer programs. The current low level of computer checkers results from programmers' failure to appreciate the subtlety of the game, and also from a lack of concerted effort on the checker problem as compared with chess. Certainly the snob appeal of chess is greater.

Kasparov understands clearly that "chess is much wider than calculation." Those who know checkers would say the same of it. While they wouldn't recommend "fantasy," they would know that calculation cannot replace the feel for position that comes only from experience.

D. O. Staley
Tucson, Ariz.

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