hope you can continue.

As Mr. Goulding in Las Vegas told me, current software handles contact positions poorly. I suggest another temporary method which may have been already considered: The Mac has a package called Hypercard. Set up the position on one Hypercard. Duplicate it 36 times. Going from card to card, make a reasonable play for each Black roll. Duplicate each of these resulting positions 36 times. Make a reasonable play for each of White's 36 rolls. The resulting 1296 cards are then assigned an equity. The computer then gives a resulting average. Two people could do a position in about an hour, but many more could work in parallel. This would tend to cancel the optimists and pessimists. ***- Cam Trenor, Bellevue, WA.***

I've experimented with the method described (minus the Mac and the Hypercard) on some opening problems with some useful but not conclusive results. In particular, it's useful in giving a clue to opening checker play problems, where rollouts are more or less useless. The drawback of the method is that if the position in question leads to other positions of the same type a roll later, the analyst's guesses as to the value of ***those*** *positions may be no more or less reliable than his guess as to the value of the initial position. Also, getting lots of good players to work in parallel on the same problems isn't as easy as it sounds.* ***- Bill Robertie***

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Dear Editors,

First I want to thank you for the improvements in my game I've made by reading your magazine. Concerning multiple cubes in chouettes, we have a rule saying that the box has to treat all cubes the same way, as long as they have the same value. ***- Bengt-Arne Ehk, Gothenberg, Sweden.***

Sounds like a cure that's worse than the disease. I've played in multiple-cube chouettes for years, and I've never seen a big problem arise. I don't like the idea of forcing the box to treat all cubes the same way - the game is much more fun and much more interesting if the box has discretion in this matter. ***- Bill Robertie***

Dear Editors,

There are some questions I would like to ask. Firstly, how complex is backgammon compared to other games of skill such as chess or bridge? Secondly, in your opinion, what percentage of backgammon in skill and what percentage is luck (using as an example a player of your caliber)? Thirdly, I would appreciate it if you could define the following words for me as used in the context of your publication *Inside Backgammon*: squeeze, pure play, crossovers, and overage. ***- Anthony Moutzouris, Johannesburg, South Africa.***

With regard to your third question: we've had requests from a number of our readers to explain some of the terminology that we cavalierly use in ***Inside Backgammon.*** *See page 6 in this issue for a Backgammon Glossary.*

With regard to your first two questions: These and related questions of this sort come up a lot and deserve to be illuminated. Unfortunately, as stated, the second question can't be answered. It's just a badly formed question. Suppose, for instance, I said that "Backgammon is 80% luck and 20% skill." What would such a statement mean? I don't know. How could I conduct an experiment to verify it? I don't know. What would such an experiment even look like? I don't know. Suppose I said that Backgammon was 80% luck and you said it was 70% luck. What would that mean, and how can we resolve our dispute? I don't know.

Asking questions that can't be answered through any ***conceivable*** *experiment is a waste of time - time better spent trying to think of an approach that could yield meaningful results. Although the ratio of luck to skill in backgammon can't be resolved, there* ***is*** *an approach which does enable us to compare games like backgammon, bridge, and chess. Follow along with me for awhile, and I'll develop a method which permits cross-comparisons of games of skill and chance.*

Let's start with chess, which has evolved a well-developed rating system over the past 40 years. Chess ratings range from a high of about 2800 to theoretical lows of about 0 (a complete beginner who has just learned the moves). Chess ratings are also designed so that a 200-

point rating difference between two players anywhere on the scale means that the higher-rated player has a 70-75% chance of defeating a lower-rated player (discounting draws, which are possible in chess but not in most of the other games we'll consider).

Now consider the following experiment:

(1) Take the best player in the world (in the case of chess, it's Gary Kasparov). Call him player 1.

(2) Find someone that the best player beats 70-75% of the time. Call him player 2.

(3) Call the difference between players 1 and 2 ***one skill differential.***

(4) Find someone that player 2 can beat 70-75% of the time. Call him player 3. The difference between players 2 and 3 is another skill differential.

(5) Continue this process until you have taken the chain down to an absolute beginner.

(6) Count the number of skill differentials involved. This is the ***complexity number*** *of the game.*

In the case of chess, this number is about 14.

We can apply this process to any game, although we may have to tinker with the notion of what constitutes a single game or contest. In chess, a single tournament game lasts four to five hours, which seems intuitively like a good length of time.

For backgammon, let's consider a single contest between two players to be, not an individual game lasting a few minutes, but a 25-point match, lasting about as long as a tournament chess game. Using Kent Goulding's rating system, and extending it downward to include beginners, we can guess that backgammon's complexity number is somewhere around 8.

For other games, we have to first think of an appropriate contest as occurring between two players and lasting in the four to five hour range. In poker, it might be a heads-up contest. In Scrabble, perhaps a best-of-five game series. Here's a rough chart of how various games would rank on the complexity number scale, and keep in mind that chess and backgammon are the only games that I'm knowledgeable enough to speak for:

COMPLEXITY NUMBERS

Go	*40*
Chess	*14*
Scrabble	*10*
Poker	*10*
Backgammon	*8*
Checkers	*8*
Hearts	*5*
Blackjack	*2*
Craps	*0.001*
Lotteries	*0.0000001*
Roulette	*0*

I can't even hazard a guess as to where Othello and Gin Rummy fall on this scale, and I invite input from readers who are more experienced in these games than I am.

The nice feature of this table is that it resolves at one stroke all the muddled thinking about luck, skill, games of skill, and games of chance. Any game with ***no*** *skill falls automatically to zero on this scale. For all other games, the relevant issue is not luck versus skill but rather the* ***interplay*** *of skill, chance, and complexity. Even the most complex games, like chess and go, are bounded by the human capacity to fathom their depths.*
- Bill Robertie ■