

# ΕΛΕΥΣΙΣ

## Eleusis — the game of oracles

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ABSTRACT: This is an altered version of the rules given to me by Bob Wieman, an undergraduate student in my H50 class at Berkeley.

Eleusis is a card <sup>♥1</sup>game played by 4–7 people, with lots of decks of standard (e.g, no jokers) <sup>♥2</sup>cards. At the beginning of each round, one person is designated *God*, and everyone else is dealt ten cards. The role of “God” rotates among the players from round to round. God decides upon a “rule” for his round. Then the mortals, in turn, lay down one card at a time. After each card is laid down, God says whether the card was right or wrong. If the card is right, the next mortal lays down a card. If the card is wrong, the mortal who laid the card picks up two new cards from the “penalty deck” sitting on the table in front of God, and then the next mortal plays. The round ends when some mortal runs out of cards.

Let me clarify now what a *rule* is. God’s rule must decide whether the card is right or wrong based *only* on the following properties:

*i*: the card’s suit (and hence color)

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<sup>♥1</sup>From: [R\\_Tim\\_Coslet@cup.portal.com](mailto:R_Tim_Coslet@cup.portal.com) (Text lightly edited): Eleusis can be found in the June 1959 issue of Scientific American in the “Mathematical Games” department by Martin Gardner. An updated version appeared in the October 1977 issue in the same department.

You can also find it in a chapter of “Abbott’s New Card Games”, by Robert Abbott, published by Funk & Wagnalls.

<sup>♥2</sup>One deck per 1.5 people is usually right, but for now we’re going to pare it down a little—one deck for every two people is fine. It doesn’t matter if some of the decks are missing a few cards. (I.e., some of the players aren’t playing with a full deck. . .)

*ii*: the card’s value

*iii*: the card’s position in the sequence, in relation to previously laid correct cards, as well as what those cards’ suit and value are.

A rule must cover all possibilities: each card laid down must be considered either right or wrong. Also, at position  $n$  in a valid sequence, the rule must be such that there is a valid card which can be played.

A few examples of rules:

*i*: “*The first card laid down is always right, and after that, the colors must alternate.*” (If the  $2♣$  was first laid down, the next card would be correct if it were a diamond or a heart, and incorrect if it were club or spade.)

*ii*: “*Only even cards (counting the Queen as even, and Jack and King as odd) are correct.*”

*iii*: “*The cards must be the digits of  $\pi$ , starting after the decimal point: ace four ace five nine. . . .*”

The rule cannot depend on who laid the card, how he laid it, which deck the card came from, whether the card is aesthetically pleasing at the moment or not, etc. Only the suit, value, and position in the sequence determine its rightness or wrongness.

Where is the fun in that, you say? Just wait. You may have realized that one of the goals of the round is to figure out the rule. Once someone does that, he *declares prophecy*. You can declare prophecy at any time, regardless of whose turn it is. A marker (typically a coin or a pencil) is put on the card where the prophet declared, and the prophet puts down his cards; they will never again be used. Only one player can be a prophet at a time. The round continues as before, except that the prophet says whether he thinks the played card is valid not, and God says whether the prophet is right. So long as the prophet is right, the round continues; but when the prophet

is wrong, he becomes a *false prophet*. The card on which the prophet fell from grace is marked, and the false prophet waits until everyone else is done with the round. As soon as the prophet is cast into flaming perdition, another mortal may declare prophecy.

Some other twists on the play of the game: If you, a mortal, so desire, you can lay down several cards at one time. This is good, because it gets rid of a lot of cards—unless you're wrong. If some part of the sequence is wrong, the whole sequence is wrong, and you don't find out where. You also receive two new cards for each card you tried to lay down.

Also, if you believe that none of the cards in your hand are correct, you can show the world (God and the other mortals) your hand, claim that you have no correct cards, and the prophet or God (if there is no prophet) will confirm or deny this claim. If you are right, you throw in as many cards up to seven that you can, and pick up new cards so that you lose a total of four cards. If you are wrong, you pick up four new cards.

## Scoring

This is where strategy comes in.

**Normal mortals.** One point for every card less than the number of cards held by the normal mortal who, at the end of the round, has the most cards. So the mortal with the most cards scores 0, the mortal who ran out gets points equal to the unlucky guy's cards, etc.

**Each Prophet.** Three points for every card played (during his term of prophecy, of course) whose validity he determined correctly. So he gets no point for the card after which he declared prophecy, nor for the card upon which he fell from grace.

**God.** God's score is that of the highest scoring mortal (which might have been a prophet).

## The layout of play

Usually, correct cards are placed, separately, left to right on the table. (If a group of cards played is correct, the group is laid down, each card overlapping its predecessor.)

**Rejected cards.** Imagine this situation: The valid sequence has  $n$  cards on the table, and you propose a card (or group of cards) for position  $n + 1$ . What happens if your proposition is wrong (i.e. doesn't fit the rule at that position)?

The card(s) you proposed is/are put –face up– *underneath* position  $n$ . If the mortal who plays after you also plays incorrectly, his card(s) is/are put underneath yours. Thus, as the game progresses, you are building a two dimensional tableau of cards. The top row shows the current valid sequence.

**Important.** Remember, the rule depends *only* on the valid sequence of played cards. Said differently, to determine whether a proposed play is valid in position  $n$ , God (or the Prophet) mentally covers up all the incorrect played cards, and only looks at the row (which is the top row) of valid cards.

Thus, here is an example of an *invalid* rule: “. . . a card is accepted if and only if it is played immediately after a card was rejected”.

Here is another example of an invalid rule: “The very first card played is rejected; subsequently all cards are accepted.”

Either you interpret it as: “The first card that Albert plays is to be rejected (Albert plays first) but then Barry's is accepted. . .” –this is no good because the rule depends on more than just the accepted sequence (which, until a card is accepted, is empty).

Or you interpret it as: “Every card proposed for position  $n = 1$  is rejected”, which violates the rule that, at each position, there must be some acceptable card in a 52 card deck.

Here is third example of an invalid rule: “A card is accepted exactly when its color is the opposite of the card two positions earlier.” This rule does

not specify how to determine validity for positions 1 and 2.

### Strategy

The example rule about the digits of  $\pi$  –while valid– is not a good rule. It is too complicated.

God will score highest if his rule is guessed early by one player (who presumably will declare prophecy) but bewilders the other players for quite a while.

In addition to being simple, one guideline for a good rule is this: At most positions  $n$ , approximately half the 52 cards in a deck would be valid in position  $n + 1$ .

Another guideline: If your rule takes more than two or three medium sentences to write, it is likely too complicated. Many good rules are one sentence long. *Avoid random rules*, like this one: “A two must be followed by a seven or a red nine. Eights must be followed by queens unless they are spades ...”. OR: “View the alphabet as 13 pairs of consecutive letters, and associate each letter with the number of its pair. Then ‘RhinocerosRhinocerosRhinoceros...’ is the accepted sequence, when written numerically.”

***Playable, but challenging, rules.*** Here is an example of a very difficult rule for *experienced* players: “The first three cards are valid no matter what they are. From then on, a card is valid in position  $n$  IFF: it is a face card *or* has color equal to the color of the card in position  $n - 3$ .”

Here is an example of a perhaps more reasonable rule: “Block the positions into groups of 13; positions 1–13, 14–26, 27–39 etc. A proposed card is valid in position  $n$  IFF the numerical value of the card (count A,J,Q,K as 1,11,12,13) has *not* previously occurred in the current block of positions.”

*Have fun!*