Royal Eleusis

by Cesco Reale

(collaborator of Italian Festival of Mathematical Games,

Swiss Museum of Games, Abstrakta Project)

Eleusis is a card game invented by the US American game inventor Robert Abbott in 1956. The name comes from the ancient greek town Eleusis, where the Eleusis mysteries were celebrated in honour of the goddesses Demeter and Persephone between the 16th century BC and the 4th century CE. The mysteries were rites kept secret to non-initiated, hence their name.

Here you can find the official page of the game. Eleusis is one of those great games that are quite unique, there are not many similar games. In this family we can find several Eleusis variants (such as EasyEleusis or Eleusis Express), as well as the party game Haggle (by Sid Sackson), the card game Mao, the chess-inspired Penultima, and the abstract games Jonash (by Pietro Gorini) and Zendo.
The aim of the game is to find out the hidden law of the game itself. And for this reason this game has a great didactic value to understand epistemology, gnoseology and the scientific method: experiences, hypotheses, counterexamples, false beliefs, complottism, and so on.
Here you can find the standard rules written in 1977 by Martin Gardner in Scientific American: Gardner_1977_NewEleusis
I played this game many many times, in game parties, at meetings of mathematical games and in the .Telegram Eleusis Bot. During the years I have improved many aspects of the rules, correcting some little problems, reducing chance, trying to make it fairer and more strategic. I called this new version Royal Eleusis, and here it is: RoyalEleusis. If you try it, please send me your comments. Enjoy!

Definitions

Law: it is written down by God at the beginning of a round.
Rule: rule of the game Eleusis.
Move: action of one player
Turn: a series of moves where each player plays once.
Round: it is associated to one law, its first move is the card played by God
Match: a series of rounds where each player plays once as God.
Game: Eleusis.

Material

3 or more decks of Bridge cards. Whenever the cards are over, a new deck will be used.

Number of players: 4 up to ideally 5 or 6.

One player plays God (or the dealer), the other players play the scientists.
If you have more than 6 players (8 according to Gardner) the game becomes too long and it might be better to play in teams of 2 to 4 players, that is actually even more interesting because players in a team can exchange ideas among them and analyse the game together. The word "player" is used here meaning "player or team".

Secret law

The God's first task is to make up a "secret law." This is simply a law that defines what cards can be legally played during a scientist's turn. In order to do well scientists must figure out what the law is. The faster a scientist discovers the law, the higher his score will probably be.
The scoring system (described below) makes it advantageous to the God to invent a law that is neither too easy to guess nor too hard. An example of a law that is too simple is: "Play a card of a color different from the color of the last card played." The alternation of colors would be immediately obvious. A better law is: "Play so that primes and nonprimes alternate." For mathematicians, however, this might be too simple. For anyone else it might be too difficult. An example of a law that is too complicated is: "Multiply the values of the last three cards played and divide by 4. If the remainder is 0, play a red card or a card with a value higher than 6. If the remainder is 1, play a black card or a picture card. If the remainder is 2, play an even card or a card with a value lower than 6. If the remainder is 3, play an odd card or a 10". No one will guess such a law, and the God's score will be low.

Here are three examples of good laws for games with inexperienced players:

1. If the last legally played card was odd, play a black card. Otherwise play a red one.

2. If the last legally played card was black, play a card of equal or higher value. If the last card played was red, play a card of equal or lower value. (The values of the jack, queen, king and ace are respectively 11, 12, 13 and 1.)

3. The card played must be either of the same suit or the same value as the last card legally played.

The secret laws must deal only with the sequence of legally played cards. Of course, advanced players may use laws that refer to the entire pattern of legal and illegal cards on the table, but such laws are much harder to guess and are not allowed in standard play. Under no circumstances should the secret law depend on circumstances external to the cards. Examples of such improper laws are those that depend on the sex of the last player, the time of day, whether God scratches his or her ear and so on.

Among other possibilities, a law can be cyclic infinite (131313...), acylcic infinite (135791113...), finite (13579), set-based (only odd numbers are accepted).

Start

The God chooses one card for a starter, then deals 14 cards to every scientist.
Then the first scientist to their left starts and the turn continues clockwise. In each move a scientist does an experiment, i.e. proposes one or more cards hoping that the God will agree with the proposals. If a scientist thinks to have understood the law, they can declare themself prophet and from that moment the prophet agrees or disagrees with the proposals of the scientists, and then the God approves or rejects the prophet's verdict.

Bets

1) The scientist in turn decides how many bets they want to do between 1 and 4 (but no more than the cards they have), each bet is a card proposed to be accepted (A) or to be refused (R). If a scientist wants to play an R bet, they must play more R bets until reaching 4 bets. So the possible bet sequences are 8: A, AA, AAA, AAAA, AAAR, AARR, ARRR, RRRR. An R bet will be accepted by the God or prophet only if the scientist doesn't have acceptable cards to play.
God accepts or rejects the bets one by one (between 1 and 4). After a wrong bet all the remaining bets of that move are considered wrong and these wrong cards are put in the downline, but face down, because they do not give information on the sequence.

2) Each right bet will be one less card for the scientist.
2.1) If the right bet is an A bet, the card is added vertically in the mainline.
2.2) If the right bet is an R bet, the card is put vertically in the downline, and, if this is the last bet of the move, the other n cards in the hand of the scientist are put horizontally in the downline (horizontally because they are counted neither for any score nor for sudden death) and the scientist receives the same number n of new cards from the deck.

3) Each wrong bet will be one more card for the scientist; moreover, if the wrong bet is the first R bet of the move, and this card is not acceptable, but the scientist could have played acceptable cards, the prophet (if present, otherwise the God) plays in the mainline one of the cards that the scientist could have played and the scientist receives 1 more card to replace the card put in the mainline.
So, let’s see all the possible cases in detail.
3.1) If the wrong bet is an A bet, as usual the card is put in the downline and the scientist receives 1 card to replace the wrong bet and 1 card as a malus.
If the wrong bet is the first wrong R bet of the move, and this card is actually acceptable, the card is put into the mainline and the scientist receives 1 card to replace the wrong bet and 1 card as a malus.
3.2) If the wrong bet is the first wrong R bet of the move, and this card is not acceptable, but the scientist could have played acceptable cards, the prophet (if present, otherwise the God) plays in the mainline one of the cards that the scientist could have played and the scientist receives 1 card to replace the card put in the mainline, 1 card to replace the refused R card (that is left in the downline) and 1 card as a malus.
3.3) If the wrong bet is an R bet after the first wrong R bet of the move, the card is put in the downline face down and the scientist receives 1 card to replace the wrong bet and 1 card as a malus.

Prophet

After each turn, each scientist can become a prophet, provided: (1) there isn't already a prophet, (2) they haven't already been prophet this round, and (3) there are still two or more scientists besides the prophet and the God.
If more than one scientist wants to become prophet, the scientists' inverse turn order gives priority, starting from who just played (inverse because this gives incentives to play an informative card, that may clarify the law only with the following card(s)).
When a scientist becomes prophet, God puts a marker (such as a Jolly) after the last played card, in order to indicate the beginning of the prophet era.

1. If there *is* a prophet, they make the calls, and God "approves" or "disapproves" each call. If God disapproves a call, overthrows the prophet and puts an upside-down marker to indicate the end of that prophet era.
2. An overthrown prophet (called "false prophet") receives a malus of 5 cards and then becomes again a normal scientist scoring later on as such.
3. If a scientist overthrows the Prophet, that scientist gets no penalty cards in this move. In other words when there is a prophet a scientist receives penalty cards only if the Prophet says "wrong" and God agrees with the Prophet.

Sudden death

The sudden death happens when at the moment of the bet at least 30 cards were played (or 20 in a prophet era).

As explained earlier, horizontal cards are ignored, so only the vertical cards (in the mainline and in the downline) are counted. During sudden death, any scientist who makes a wrong play is expelled. E.g. if there is no prophet, 28 cards were played, a scientist bets 4 cards to be accepted and they are rejected, the scientist is not eliminated, even if he played a wrong card after the 30th card. But the following scientist will be in sudden death.

Hints

The God can give hints before the beginning of the game (and, possibly, before knowing the order of the scientists). Then, just before the beginning of sudden death, the God can give a second hint. In a formal play, the other players should never give hints.

Ending

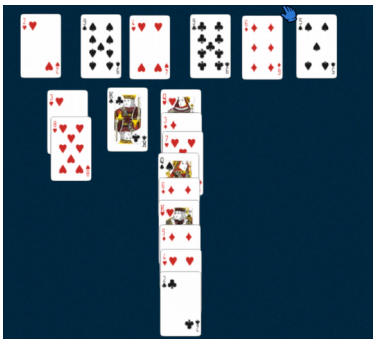
A round ends when either (1) some scientist runs out of cards, or (2) all scientists have been expelled for wrong plays during "sudden death" period. The match ends when everyone has been God once (but you can end earlier).

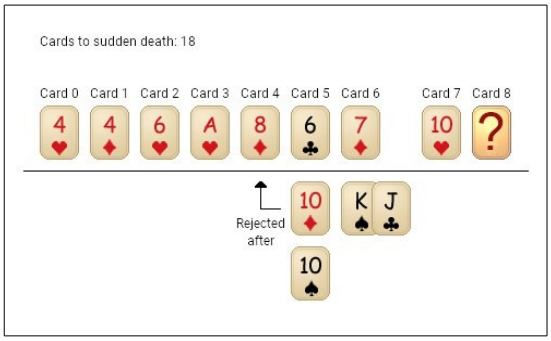
Scoring

1. Find the *high count:* the largest number of cards held by any scientist (including the prophet). Everyone except God gets points equal to the high count minus the number of cards in their hand.
2. Any scientist with no cards at all gets a 4 point bonus.
3. If there is a prophet at the end of the round, they get as a bonus 1 point for each right bet in their prophet era plus 2 points for each wrong bet in their prophet era. It means that each right bet in the downline and each wrong bet in the mainline should be marked somehow (e.g. with a coin on the card) in order to be distinguished

respectively from the right bets in the mainline and from the wrong bets in the downline.

4. For a false prophet their points during their era are divided by 2.
5. God's score is the smaller of (a) the highest scientist's score, or (b) twice the number of cards played before the True Prophet era.
6. If you end the game early, who has never been God gets as compensation the average points made by the Gods in that match minus the average of all the scores of the scientists in that match. This difference is in general a positive number.
7. The person with the largest number of points wins.





Site-bibliography

1. Abbott, R. http://www.logicmazes.com/games/eleusis/
2. Gardner, M. - "On playing New Eleusis, the game that simulates the search for truth". Scientific American, October 1977.
3. https://web.archive.org/web/20190822201119/http://www.matuszek.org/eleusis1.html
4. https://eleusis-2.web.app/
5. https://telegram.me/EleusisBot