

## TAROT AND PHYSICS

*This paper was originally written in a scientific format. Here, even though this is not a scientific journal, I have decided to stay with that form, perhaps to honor one of the cultural rituals of the scientific community!*

### **Abstract**

After using Tarot cards daily for several years as part of a meditation and self-reflection practice, Jane English, a Ph.D. physicist felt both personal and scientific need to reconcile her Tarot experience with her scientific worldview. Statistical analysis of cards chosen daily in meditation for three years from 1978 to 1981 (one card for “body,” one for “mind” and one for “spirit”) shows 99.97% probability of their being non-random. Analysis of cards similarly chosen by two other Tarot practitioners shows even greater non-randomness. Control experiments done with numbered index cards and with a computer random number generator are consistent with randomness. The deciding factor in producing the non-random results is that cards depicting powerful archetypes be chosen from an expanded state of consciousness after a period of meditation.

Australian physicist Brian McCusker has replicated the experiment a number of times with several people and shows similar results. At Jane English's suggestion he also analyzed his data separately for the body, mind and spirit cards. As she hypothesized, the results were increasingly non-random as one goes from the subject/object world of the physical body, through the intermediate world of mind, to the unitive world of spirit.

This simple experiment can be replicated by anyone willing to make the effort.

### **Introduction**

It is commonly thought that science is incompatible with Tarot, that science is totally logical while Tarot is totally intuitive. For a long time, I too was of this opinion and, being committed to a scientific worldview, would have nothing to do with Tarot. I saw it as mere fortune-telling, as something used by the unscrupulous to manipulate and control those who were too lazy to take responsibility for their lives. However, some years after I became as interested in exploring the inner worlds of consciousness as I had been in exploring the outer world scientifically, I met and studied with people who were using Tarot in a way that appealed to me. They used it as a mirror of consciousness and as a tool for growth and transformation.

### **Using Tarot**

I found that Tarot helped me to focus intuition and perception and to find within myself a deep and true kind of knowing. It helped me to

perceive aspects of myself and of the world of which I am not ordinarily aware. I used it as a tool, a mirror for clarifying and getting new perspective on situations in my life.

As I began to use the cards I often had a vague sense of uncanny accuracy in the three cards I chose daily as a part of a meditation. Each day I picked cards to represent body, mind and spirit aspects of myself. When I turned over the cards I had chosen face down and saw which ones they were, they usually seemed absolutely appropriate to my present situation. Often they brought into full awareness something of which I was only half aware. Sometimes the connection between the cards and my situation was very specific and sometimes more general. The following examples of dreams and Tarot cards illustrate this connection. I used the Crowley-Thoth deck. I wrote the dreams in my journal *before* choosing the day's cards.

*Dream:* Water with green slime in it is poured over me.

*Tarot Card:* Seven of Cups—Cups overflowing with green slimy water.

*Dream:* With paper and charcoal, I am making a rubbing of a stone that has a bumblebee and an elegant lady carved in it.

*Tarot Card:* The Empress—An elegant lady with bumblebees embroidered on her shirt.

*Dream:* The water coming from a garden hose I am using slows to a dribble. I follow the hose back and discover that it is not connected to any source.

*Tarot Card:* Eight of Cups—Only four of the eight cups are being filled with water. The flower stems are not rooted in the earth. This is a similar image of reduced flow and disconnection from a source.

*Dream:* A house I have lived in and a car I have driven are both burning. I am not afraid.

*Tarot Card:* Princess of Wands—Swirls of fire and the fearless lady with the tiger by the tail. Flowers that symbolize aspects of one's identity that are no longer needed are burning on a pedestal.

*Connection:* Cars and houses are also symbols of identity. In both the dream and the card, symbols of identity are burning, and this is happening without fear.

*Dream:* I am with a friend who is one of my teachers. We have a bowl full of cookie dough and half-formed cookies. We meditate before starting to work on the cookies. As I start to reach for the dough, he asks that we meditate more. I close my eyes and experience light, stars, colors, and patterns of energy. I feel our unity as energy. I no longer have an identity; there is no sense of "me," just consciousness and energy. There is awareness that he and I are in this experience together. We are the experience, the awareness.

*Tarot Cards:* The Tower—In the "body" position of the spread. A fire-breathing dragon destroying the tower, a symbol of identity. Human figures falling from the tower, symbols of personality images being cleared away. An eye above, a symbol of clear vision of one's true self.

Three of Wands—In the "mind" position. Orange and white flames and open lotus flowers, symbols of integrity and wholeness in one's perception of self and others.

Ace of Wands—In the "spirit" position. The torch of fire, a symbol of the ability to burn out obstacles in consciousness and to go beyond conditioning.

*Connections:* Light, fire, vision, energy, and transcendence in both dream and cards.

### "Scientific" Doubts

Reconciling my experience of the cards as mirrors with my scientific training that views external things as really separate from ourselves was a slow and difficult process for me. From an orthodox scientific perspective the Dream/Tarot correlations would be seen as too subjective to be good data. Most scientists would say that the cards are separate from the person who chose them, that they were chosen in a random way, and that therefore the cards could not have a meaningful connection to the person's subjective reality. Connections like those in the Dream/Tarot examples would be seen as the result of imagination and chance, and therefore not to be considered real. Scientists say the cards and the person are separate so the choices are random, and Tarot practitioners say the cards and the person are connected so the choices are not random.

Being both a scientist and a Tarot practitioner, I was intensely interested in resolving this conflict! Having experienced much that is useful and valuable in using the tools of both science and Tarot, I was interested in integrating these two areas of my experience. I decided to apply one of the tools of science to my Tarot experience. I did a statistical analysis of my records of the Tarot cards I had chosen in meditation for a period of two years. Two friends, whom I will call B and C, had followed a similar practice and had records of cards chosen over two and three years, respectively. They lent me their records so I could do a statistical analysis of the cards they had chosen.

Statistical analysis is a tool used in science to test the relative validity of conflicting hypotheses, conflicting theoretical explanations of phenomena observed in experiments. As such, it was ideally suited to seeing which was more valid, science's claim that choosing Tarot cards is random or Tarot's claim that it is not random.

I had much mental and emotional resistance to doing the statistics. I knew that I would feel stuck with the results. Either it would affirm my old scientific worldview that I was beginning to find too narrow, or it would force it to change and set me off into the unknown.

### **The Importance of Subjective Data**

When exploring something, like the use of Tarot, that is related to both subjective and objective experience, it is important to include subjective data along with the objective data. The following material is the subjective data associated with the records of the Tarot cards chosen.

As I did my three-card spread each day, I expected that the cards chosen would mirror my state of consciousness. I chose them after a period of shuffling that served primarily as a concentration device as I focused my awareness on myself and the coming day. The shuffle was only secondarily a way of randomizing the cards. This focusing of awareness was not a narrowing of attention, the usual thinking about or concentrating on something. On the contrary, it was an expansion, a relaxing that allowed new thoughts, emotions, intuitions, sensations, and sometimes a sense of quiet emptiness to emerge into awareness.

After the shuffle, I then spread out the cards face down in a fan. Following an inner sense of appropriateness, I chose three cards to represent body, mind, and spirit. Sometimes my eyes and hand seemed drawn to a particular card. I knew it was right when my whole being seemed to say "yes." The "yes" is the verbal component of an experience that involves thoughts, emotions, intuitive images, and physical sensations. At the time of doing most of the spreads, I had no intention either of trying to guess what cards I was choosing or of eventually subjecting the cards chosen to a statistical analysis.

Person B says that during the shuffle, she becomes very quiet and clear. She feels that everything is on hold. She sometimes shuffles for as long as five minutes before spreading out the cards face down in a fan. She has a variety of ways of choosing the cards. Sometimes she runs the palm of her hand above the cards without touching them and at certain cards experiences a sensation that to her means "stop." At other times she uses one of her fingers rather than her palm to choose in a similar manner. At times her eyes seem drawn to a particular card. Occasionally, instead of feeling a sensation, she notices that her breathing becomes irregular or that she feels very clear as her hand, fingers, or eyes approach a certain card. She may not immediately pick a card that comes to her attention in one of these ways. She may move on to other cards and then come back to the original card to see if what she calls the "charge" is still there. She may experience charge with several cards before deciding which three to choose.

Person C says that she chooses her cards each morning. She usually spends ten to fifteen minutes on a spread. She shuffles the entire deck, then divides it into three stacks. She then shuffles each stack individually and makes a fan of it. There is always one card in each stack that her eyes are instantly attracted to. About half the time, the cards mirror to her either what is going on in the physical world at that time, what she is thinking about, or what she is feeling. And half the time, she doesn't immediately see any significance in the spread. But she says that as the day progresses, she can see a correlation between the spread and what she is experiencing.

### Statistical Analysis of the Cards Chosen

The question being considered is, “Are the choices of Tarot cards done as described above random, or are they not random?” The following procedure is a way of deciding that question by calculating the probability that they are not random.

*Definition of e* — the expected frequency: If the choices are random, the probability in any one choice of picking any one of the 78 cards in the deck is exactly equal to the probability of picking any other of the 78 cards and is equal to 1/78. When a large number “N” of choices is made, the expected number of times “e” that a particular card is chosen is defined as  $e = N/78$ ; “e” is called the expected frequency.

*Definition of  $f_i$*  — the actual frequency: Anyone who has rolled dice knows that on the average, each number comes up 1/6 of the time, but that for a finite number “M” of rolls the actual number of times each number appears varies widely from M/6, even when the dice aren’t loaded! Similarly, the actual number of times card “i” is chosen from the 78 Tarot cards will vary widely from N/78, even if the choices are random. The actual number of times card “i” is chosen is called the actual frequency and is labeled “ $f_i$ .” The group of 78 numbers  $f_i$  for  $i = 1$  to 78 is called the frequency distribution of the cards chosen.

*Definition of  $X^2$* : In statistical work the quantity  $X^2$  (chi-square) is used as an overall measure of the variation, in a frequency distribution, of the actual frequencies  $f_i$  from the expected frequency e. The following equation is the definition of  $X^2$

$$X^2 = \sum_{i=1}^{78} \frac{(f_i - e)^2}{e} = \frac{(f_1 - e)^2}{e} + \frac{(f_2 - e)^2}{e} + \frac{(f_3 - e)^2}{e} + \dots + \frac{(f_{78} - e)^2}{e}$$

*Finding P* —the probability of non-randomness: Statistics texts contain tables showing the probability “P” that a frequency distribution with a certain value of  $X^2$  is not the result of random choice. From the records kept by myself (person A) and by persons B and C, I counted N ( the total number of cards chosen by that person) and all 78 of the  $f_i$  (the actual number of times each of the 78 cards was chosen by that

person). Using these numbers, I calculated “e” and then  $X^2$  for each person. Then by using the tables, I found a value of P for each person. Figure I shows these values of N,  $X^2$ , and P.

*Controls*: As a control, I made a pack of 78 index cards, blank on one side and numbered 1 to 78 on the other. Using the same kind of shuffle procedure I had used with the Tarot cards, I chose the same number N cards, three cards at a time, recorded them, and did the same statistical test for non-randomness. The only difference was that I chose them all in a period of a few hours and not as part of a meditation. The results of this are shown in Figure 2. As a further check I programmed an Apple II computer to perform the same process. The results of this are shown in Figure 3.

*Results*: In most statistical work, probabilities of either 95% or 99% are considered sufficient for an effect to be considered real. So the data in Figures 1, 2, and 3 certainly constitute evidence that something other than random chance was operating in the choice of Tarot cards in meditation, and that the index-card and computer choices can be considered random.

Tarot cards by person	N	$X^2$	P
A	1982	127.3	99.97%
B	2015	1161.0	99.999...% ( $100 \times 10^{-10}$ )
C	2395	132.4	99.99%

Figure 1

Index Cards	N	$X^2$	P
	1982	85.83	53%

Figure 2

Apple computer	N	X <sup>2</sup>	P
1	1410	82.5	50%
2	1680	88.5	65%
3	1821	59.2	*
4	1983	70.84	*
5	1983	66.04	*
6	1983	102.31	94.8% (see note p.60)
7	1983	58.64	*
8	1983	71.63	*
9	1410	66.9	*
10	1680	69.7	*
11	1821	79.8	*
12	2052	85.9	53%
13	2394	85.8	53%

\* = less than 50%

Figure 3

### Interpretation of the Statistical Analysis

This statistical analysis exemplifies one of the positive aspects of science. You follow your doubts in a systematic way as far as you can. Then when you have finished with this, you are stuck with the reality of your results. There is no room for further doubt. I used statistical analysis, one of the tools of science, to measure the probability of non-randomness in the choice of Tarot cards.

Saying the choice is random is the same as saying that the cards are totally separate from the person who picks them. Saying the choice is not random is to say there is a connection between the person and the cards. After doing all the analysis, I was stuck with the reality of the connectedness of the Tarot cards and the person who chooses them in meditation, even though my old scientific belief system asserted that there was no connection. The statistical analysis doesn't show the nature

of the connection between the person and the cards; it just shows that it is very probable that there is a connection of some kind.

This evidence of a connection can be interpreted in a variety of ways. One possibility is that we cheated in some way, that we peeked at the cards or that their backs were marked. But the fact that, except for 29% of my own data (person A), the Tarot cards were chosen without any intention of subjecting them to a statistical analysis provides a reason why we would have no motivation to cheat. It is also possible that the shuffle was not sufficient to make the choices random. However, the index-card data make this possibility seem quite unlikely.

Another possibility is that some kind of psychic or ESP process was happening. Remembering that in the process of choosing the cards, physical sensation was involved in the experience of "yes," one could say that the cards are perceived by some kind of sixth sense. My objection to this kind of explanation is that calling it psychic mystifies the experience of direct intuitive knowing, an experience that really is quite common and ordinary. Introducing an "ESP mechanism" is an unnecessary complication.

I prefer to interpret the statistical analysis and the Dream/Tarot correlations as showing that there is some kind of subtle connectedness, resonance or direct knowing involved. This is far more simple and elegant than hypothesizing more mechanisms of perception. Direct knowing is a dissolving of boundaries and a merging of identities. We experience the cards as if they were part of ourselves. The assumption that the cards are separate from us is what underlies the "scientific" belief that the choices are random. On a gross physical level the cards can be seen as separate, other than the physical connection from the cards on the table through the table legs, down into the floor and up into our bodies through the chairs. But that is not the kind of connection referred to in direct knowing. The connection is more subtle, at a deeper level of reality that underlies the physical level.

The interpretation of the data as implying a deeper kind of connectedness supports the evolving worldview of Tarot practitioners, the belief that the external world and inner states of consciousness mirror

and reflect each other. The Tarot cards form a microcosm in which this reflection is clearer than in everyday life. Having been created by many people over a long period of time, Tarot is a good mirror with few distortions. It is easier to see the reflection symbolically in the cards than in the complex events of life.

The next step in this evolving worldview is to go beyond the inner/outer split and find that the totality of one's experience is coherent, is based on unity of some kind. It seems that separation is an appearance, an illusion that we can play with and enjoy, rather than being something absolute.

#### A Replication of This Experiment

A copy of an unpublished report on this material was noticed in 1986 by Australian physicist Brian McCusker. He had two people replicate the experiment for one year with the following results (McCusker, 1988) (figure 4):

Tarot cards by person	N	X <sup>2</sup>	P
D	1095	141.3	1.4x10 <sup>-5</sup>
E	1095	282	10 <sup>-24</sup>

figure 4

Both D and E did control sets of shuffling and card choosing with regular playing cards and obtained results consistent with randomness for these. Person E continued the experiment for two more years (figure 5).

E - 3 yr. run	N	X <sup>2</sup>	P
	3288	1177	3x10 <sup>-109</sup>

figure 5

Hypothesizing that the degree of non-randomness (that is, the degree of connectedness) would increase as one focuses first on the physical world of discrete objects for the body card, then for the mind

card on the world of thought which is non-physical but still subject-object oriented and finally for the spirit card on a unitive world of oneness beyond any subject-object split, the present author (Jane English) suggested to Brian McCusker that he do separate analysis for the body cards, for the mind cards, and for the spirit cards from person E's three year run. He did so with results that confirm the hypothesis (McCusker, 1990) (figure 6):

	N	X <sup>2</sup>	P
Body cards	1096	419.9	5x10 <sup>-34</sup>
Mind cards	1096	438.8	4x10 <sup>-36</sup>
Spirit cards	1096	531.9	6x10 <sup>-46</sup>

figure 6

It is especially interesting that the idea of doing separate analysis for the body, mind and spirit cards did not even occur until after the experiment was complete, making it unlikely that there was any bias on the part of person E.

#### A Note on Oracles

Tarot is an example of an oracle, as are I Ching, The Runes, The Medicine Cards, The Gaia Matrix Oracle and numerous other systems. An oracle is a symbol system that is an integrated map of the archetypes present in our individual and collective psyches. Daily use of an oracle is like a look in the mirror each morning, only it is a look at the deeper levels of the psyche. This experiment could be repeated using any of these oracles. Probably the non-randomness would be highest when a person uses an oracle that has personal meaning for them.

#### Conclusion

This experiment is one that anyone can do; no expensive laboratory equipment is needed. But it is not necessarily an easy experiment. Daily discipline is needed, as is the willingness to be changed by the doing of the experiment. The combination of daily meditation and conscious interaction with a powerful collection of archetypes cannot help being a

deep adventure in self-exploration and transformation. To do this experiment one must grow beyond identifying oneself as an “objective” scientist and become a “new scientist” who is committed to truth in a very broad sense.

### References

McCusker, Brian and Cherie Sutherland McCusker. (1988). “An Experimental Test of the Basis of Probability Theory”, *The Australian Physicist*, vol.25 #1, Jan/Feb 1988, pp. 20-24.

McCusker, Brian. (1990). private communication.

### Note

Run #6 in the Apple computer data on p. 56 has a non-randomness probability of 94.8%. This is barely below 95%, the conventional level of significance. All the other runs have 65% or less probability of being non-random. Note also that run #7 has the lowest  $X^2$  and so the lowest probability of non-randomness of all. As an interesting anecdote I will describe here what my subjective state was while the computer was doing those two runs. This was in the early days of personal computers and each run took over a minute.

On seeing run after run come out consistent with randomness during the first five runs I realized that there really was something different going on when Tarot card choices were made after meditation, rather than quickly with the index cards or the computer runs. I felt myself fully accept that there was a significant effect, a kind of connectedness happening during the use of the Tarot cards after meditation.

I sat there experiencing this sense of connectedness while the computer was doing run #6. Much to my surprise that run came out very close to being significantly non-random, in other words, “connected” to my state of consciousness. I had had no intention of influencing the computer.

Being still a scientist, I said to myself, “OK, so if that is “connectedness,” I’ll now go into a state of “separateness” for run #7 and see what happens. Going from connectedness to separateness can be best described as sort of like taking off a jacket, deliberately removing something. Run #7 done while I was in this state of “separateness” came out the least probably non-random, or the most probably random, of any of the runs.

Interesting experience! This is not scientific data but seemed worth mentioning here.



*Science meets Intuition*