So, You Think You're Psychic?

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To my uncle Patrick, my uncle David, and my Grandma Irene,
all of whom introduced me to this subject.

Contents

CHAPTER 1

Why Test Psychic And Spiritual Powers?

> **paranormal:** Events or occurrences that cannot be explained by standard biological, physical, or scientific theories; events said to be caused by people with psychic or spiritual powers. Events like these are sometimes noted by the shorthand *psi*, or symbol Ψ.

1. So, You Really Think You're Psychic?

Almost everybody thinks that there must be *something* to the paranormal. We've all heard stories of people who can read other people's minds, people who can move objects with their minds, and people who can communicate with the spirit world. And if you've cracked open this book and read this far it means you have at least a little interest in exploring psychic, spiritual, and paranormal phenomena on a more detailed and in-depth level than most people. If you've read or heard about such things as psi powers, ESP, communicating with the dead, psychokinesis, psychometry, astrology, and other paranormal phenomena and wanted to know whether you or other people might have these psychic abilities then this book is for you.

This book contains simple, practical procedures that anyone can use to test for the existence of several different paranormal abilities. Most tests can be performed using ordinary items found around the home. The tests, while modest and uncomplicated, are designed to resemble experiments carried out in professional parapsychological laboratories. And if the experiments are performed carefully then the results from them will be just as valid as professional tests. Most of the phenomena detailed in this book, such as mental telepathy and clairvoyance, can be tested with several different experiments, each exploring a different aspect of the ability.

This book will show you how claims of the paranormal are built and whether the evidence supporting those claims is legitimate or suspect. No advance knowledge of the experimental procedures used to test psychic phenomena is necessary. All the information needed to administer the experiments and interpret the results is given. Each chapter begins with a brief description of the topic phenomenon, followed by an easy-to-do experiment presented in cookbook form. An entire chapter is devoted to learning how to score and interpret test results, which are given in the form of *probability scores.* This chapter should be read *before* any experiments are tried as it is crucial to learn what probability scores mean and how they relate to the results obtained from the experiments.

Paranormal phenomena can be tricky to interpret—it's easy for ordinary events to appear paranormal, for example. Each chapter contains a detailed section on what can go wrong with each experiment, with an emphasis on how nonparanormal signals can bias or mask results and cause them to mistakenly appear paranormal. Finally, there is a discussion at the end of every chapter for those readers who want more information about professional tests that have been conducted in the given area.

Professional parapsychologists will benefit by a careful reading of descriptions of probability scoring for each experiment. Especially relevant are explanations of how some common scores are misapplied and how feedback can skew scores towards accepting the existence of psi when this acceptance is not justified by the data. Chapter 15 lists some articles that may be of value to researchers.

Probability, as it relates to scoring, is defined and detailed in Chapter 2. These introductions are necessary because most test results are stated in the form of probabilities. More specifically, probability scores are measures of how astonishing test results are when compared to the idea that no psychic ability exists. Most calculations for these probability scores are provided and contained in convenient tables. There are one or two special instances where calculations cannot be done in advance, and in these cases you are guided through the necessary steps to compute the score.

Lastly, this book is *not* one of the standard flowers-and-stars-on-the-front-cover gushing accounts of how psychic powers will

usher mankind to a "higher spiritual plane," or a syrupy collection of anecdotes ("Concentrate on our patented eighteen-and-a-half steps to spiritual happiness and wealth will be given to you just like it was to me!"), designed to get you excited about something but teaching you nothing. This book is concerned with evidence, how to create it, what it means, and why it is meaningful.

2. Why Should You Do These Tests?

There are two basic, and compelling, reasons why you should do these tests. The first is very simple: to prove that you, or someone you know, have psychic abilities—it's easy to perform the tests, look up the score and immediately see the results. If you are skeptical of the existence of certain phenomena and want to test whether you or your friends possess ESP, you will find these experiments invaluable.

The second reason to do these tests is to convince others that paranormal abilities are real. Some readers will automatically think, "It doesn't matter what other people think. I believe in these abilities and that is all that counts." To a certain extent that is true. But let us take an example to see why other people's opinions might be important. Suppose you wholeheartedly and faithfully believe in telepathy. Nothing in the world can shake you of the conviction that telepathy is a real and viable form of extra-sensory communication between humans (and maybe even between other animals).

Well, is that the end of it? If it's the case that no amount of negative evidence can shake you of the belief that telepathy exists then you wouldn't go through the trouble of doing any sort of ESP test in the first place. Why bother? It's already true, so there is no reason to test. Okay, but what if a friend expresses some doubt. How can you convince her that your belief is solid, that it's true? Is your word enough? Should she believe you just because you told her so? Should the depth of your emotional attachment to the belief sway her? Or will you at least try and say something like "Well, I read that this guy was able to bend a spoon with his mind..."? Would you tell her a story like this? In other words, will you try to convince her based on some form of *evidence*? If

you have any hope of convincing anyone of anything you will need evidence.

I think we can agree that anecdotal "evidence," friend-of-a-friend stories and the like, is not the strongest form of authentication. It can be valuable, that is certain, but never authoritative. Anecdotes are like hearsay. The *American Heritage* dictionary defines hearsay as "evidence based on the reports of others rather than the personal knowledge of a witness and therefore generally not admissible as testimony" in courts of law. The duties of a court of law is to decide facts and to conclude whether some disputed matter is true or false—which are the same duties a formal scientific experiment has. The reason hearsay is not admissible (or authoritative) and not used to help decide truth in courts is because the anecdotal testimony that would be given is not subject to cross-examination. The details of hearsay testimony cannot be scrutinized because those who originally witnessed the contested events are not available to question. This puts the listener of hearsay into the position where they must either accept or reject the story as a whole. This is not satisfactory, which is why stronger kinds of evidence are needed.

Solid, believable evidence based on well-run and reliable experiments is the best kind of evidence there is. Formal tests, like those reported in reputable scientific journals, is subject to scrutiny and cross examination. The methods, background, and data are laid out and available for all to see. Readers are free to argue for or against the results, and have a legtimate basis upon which to do so. Further, the experiments described in these journals can be understood and can be replicated.

Are formal experiments absolutely convincing? Absolutely not! For example, it is well-known that professional researchers make mistakes all the time. Clinical trials reported in prominent medical journals, for example, are frequently amended as new evidence is discovered. Those in authority often have their own devious motivations and can state results in a misleading fashion. Many researchers use poor, inappropriate, and outdated statistical methods and are fooled into believing hypotheses that are false. All sorts of things can and do go wrong. Nevertheless, these mistakes in methodology or interpretation can and are corrected through time. This is how science progresses. We should not automatically

believe an experimental result just because it is reported in a certain prestigious journal, but experience shows that using these experiments as a guide is a reasonable thing to do.

Experiments should be bias free, they should eliminate any suspicion that anything but the phenomena under examination could be responsible for the results, and, perhaps most importantly, *they should be reproducible.* All data that is produced by a genuine paranormal mechanism (under a given test condition) should and *must* be repeatable. For it is only then that the results become believable. This is because it always possible in psychic tests, by chance alone, for someone to pass a parapsychological test (and for researchers to conclude psychic abilities have been demonstrated) even though the results are due to nothing but random fluctuations and normal processes. Of course, it's important to determine what it meant by the phrase "by chance alone." Chapter 2 is devoted to this topic.

3. WHICH PHENOMENA ARE TESTED

There are many different and varied psychic, spiritual, and paranormal powers and phenomena that can be tested. This book limits the selection to the major abilities like telepathy, communicating with the dead, and precognition, although using the precepts and guidelines developed in the book the reader should have little trouble designing custom tests for other, perhaps even non-paranormal, phenomena (this will become more clear after the next chapter).

Here is a list of major psychic abilities for which tests are developed in this book:

Telepathy	Clairvoyance	Precognition
Psychokinesis	Dowsing	Psychometry
Astral Projection	Astrology	Seances
Auras	Numerology	Tarot cards

Chapter 13 describes paranormal and paranormal-like situations for which testing is difficult. The following descriptions are included: near-death experiences, lie detectors, magic spells, alternative medicines and faith healing, numerology, tarot card readings, palmistry, phone psychics, dreams, and ouija boards.

4. The Plague of Parapsychology

In innumerable historically-published parapsychological experiments, cheating has turned out to have been an enormous problem. There are many forms of cheating. Cheating is when the subject of an experiment uses normal means of accomplishing a result instead of using his psychic ability. A good example of this took place in the 1970s when the parapsychological community was beset upon by a rash of cutlery benders (fully detailed in Chapter 6).

The paranormal ability to bend cutlery or house keys with the mind is, I hope you will agree, very odd. It doesn't appear to be a very useful psychic ability as it's almost always easier to bend silverware using ordinary muscle power. And, in fact, muscle power was found to be cause of all purported psychically-bent metal. In other words, the metal benders cheated. Most times these ersatz psychics cheated right under the noses of the researchers who supervised the paranormal tests! How could they get away with it? Because those researchers did not believe the subjects would want to cheat. There were even times the researchers *did* catch their subjects cheating, but the researchers believed the subjects only cheated sometimes because of, among other reasons, the "pressure of performing." This creates the dilemma (or burden) for the researcher who must identify which times they believe their subjects cheated and which times times they believe they did not. A next to impossible task.

It is very noble to believe that all people are basically honest, but quite another thing to set up an experiment hoping they are. Experimental protocols, or the rules, guidelines, and milieu under which the test operate, must insure there is no opportunity to cheat. If it can be conclusively demonstrated that there was no way to cheat on a test it will be a million times easier to convince the public that the results are valid.

But demonstrating the impossibility of cheating is difficult because of the innate cleverness of the human being. He can cheat at anything and is damn good at getting away with it. Designing cheat-proof experiments is like an arms race. Protocols are set and people find a way around them, the protocols are strengthened and people find new ways around them...and so on until the end

result is a beastly collection of rules and regulations that seem outrageous and unnecessarily stringent but are in fact essential to eliminate or lessen the chance of cheating.

There is another reason that the parapsychological community does not want cheaters. It is because every time people find out that a parapsychological experiment was compromised by cheating, doubt is cast upon the entire field. If, as has often been the case, every time a positive result is reported it turns out to be the result of cheating, the next time the public hears of a positive result they're much more likely to suspect that someone cheated rather than believe a genuine psychic manifestation took place. This is the state of the field today.

The general scientific community does not accept paranormal phenomena as proved. Most parapsychologists agree with these scientists and say that many areas of psychic research are not yet sufficiently established. Both groups agree that cheating has been and continues to be a major problem. The majority of the public, choosing to overlook cheating or unaware of it, accepts psychic experience as real. These people do so on faith and not on evidence. This book shows how difficult it can be to find this evidence. So difficult that some may be tempted to artificially manufacture positive results.

I cannot stop you from cheating on these tests. You'll be doing these experiments on your own turf, away from prying eyes and overly strict men in white lab coats. It will be oh so easy to take a peek every now and then so that you get a good result. But the only person you're harming is yourself. Because if you want anyone to believe your results you'll have to be able to replicate the effect at a later time. And then you won't be able to cheat.

CHAPTER 2

How Testing Is Done

> **testing:** The art of deciding whether something is true or not. Also, the steps, procedures, or experiments used to gain evidence of the truth or falsity of a claim.

Some of you will want to skip this chapter and race ahead to start doing the experiments. Don't do it. Read through *all* of this chapter before attempting any experiment. The important goals of the testing procedures are outlined here: how the tests work and what they mean. You also have to know how to interpret the scores that are the result of each test. To do that, you first need to understand what probability is and how it is used to create scores. Finally, you have to understand what this book is all about.

One of the main goals of this book is for you to become suspicious of anything you read or hear about paranormal phenomena. Why? Because suspicion can be a good thing. It can keep you from making mistakes. Suspicion is encouraged because it can keep you from believing something that isn't true. Whenever you hear an extraordinary claim, and paranormal claims are certainly extraordinary, you should instinctively start forming questions. Before you accept a claim that some paranormal phenomenon caused an event you must first convince yourself that ordinary explanations for the event are inadequate. It is common to make mistakes in interpretation and you need to know how to spot them. For example, if you want to accept a paranormal claim, you must be able to rule out the possibility that something "normal" caused the event of interest. Paranormal claims are often marred by sensory leakage, cheating, and misinterpretation. This chapter will define these terms and give you the necessary tools to better judge experimental data. It will help you to know when you should be suspicious.

1. HOW THE TESTS WILL WORK

Each of the following chapters begins with a brief history and description of a particular form of psychic or paranormal ability. These descriptions are for orientation purposes only and are not intended to be complete. The interested reader is invited to make use of the references listed in Chapter 15 to supplement her paranormal knowledge if she is unfamiliar with some of the terms. However, each psychic ability is explained in enough detail so that the beginner can grasp the basics and perform the experiments.

Some chapters feature only one test, others more. It is *strongly recommended* that each chapter be read in its entirety before starting any experiment. The test descriptions are as compact and clear as possible. But if you, in your enthusiasm, get halfway through a test and discover that a certain procedure has been omitted then you must to throw out *all* the results up to that point. Why? The danger is that, if some steps are overlooked, all your results may be meaningless (more on this later): it is just too easy for regular, normal events to appear paranormal. You want to be certain your results mean what you think they mean. Since some of these experiments will take a long time you will want to be absolutely sure you are following all of the instructions, so read the test protocols carefully.

Each experiment begins with a list of necessary materials. Most equipment, like playing cards and dice, can be found around the house. The most difficult task will be to enlist the aid of friends for some experiments. Other experiments, such as one telepathy experiment, can be costly and time consuming: this is the *ganzfeld* test. The details of this particular experiment are included because it, unlike any other mainstream parapsychological test to date, has given the most tantalizing evidence for the existence of psi. If the ganzfeld test isn't attempted, you will at least have access to its workings and will gain an appreciation for the great lengths some researchers go to design their experiments.

Following the material list is a step-by-step procedure of each test. There are times when you may deviate from the written instructions, but the overall test protocols should be followed very closely. Personal freedom is encouraged in how you chooses to manifest your psychic ability. Some people like to grunt and wave

their arms around, more furrow their brows and stare intently, while others lie silently and let their mental energy calmly flow from their bodies.

Most experiments ask the subject to guess the characteristics of some hidden object or the unknown value of a random device (like playing cards). Correct guesses are called *hits*, *matches*, or *positive responses*. These terms will be used interchangeably throughout this book. The number of hits is compared to a table where you look up your *probability score*. Probability scores are fully discussed in the next section. Basically, the lower the probability score (the smaller the number, or the closer it is to 0) *the less it is likely that the number of total hits could have occurred by chance and the more it is likely you have demonstrated true psi abilities.* Again, low probability scores are good in the sense that they are evidence of psychic functioning.

Regardless of any score you get on any experiment, you will convince no one that you have true psychic abilities, not even yourself, unless the high level of performance on a test can be consistently duplicated. If you cannot routinely score well, under controlled conditions, it is more likely that one or a few good scores were the result of chance. Lack of reproducibility is another great bane of parapsychological research. There are countless times when a researcher has reported a positive result—a result which later turns out to be impossible to reproduce. A surprising number of these results are retracted due to the understandably over-zealous nature of the researcher—a potential positive result can seem too good to sit on and the anxious researcher rushes his results to publication before he ascertains whether or not the effect can be replicated. Don't make the same mistake. Take the time to do the experiments right.

Each chapter ends with an extensive segment detailing what can go wrong with a test and how to avoid common mistakes. Again, *always* read this section: it is crucial that this information is completely understood before embarking on any trial.

Finally, each of these tests is designed to be as rigorous as possible. These tests are only a small step away from what is found at genuine parapsychology laboratories (all that's missing is the white lab coats!). The most important differences between the home and professional experiment is that the home tests do

not (and cannot) guard against sensory leakage as adequately as the labs do. Sensory leakage is an immense problem, as you will discover, but by being aware of it you will be able to limit its ill effects. These tests were designed to meet exacting standards and if the procedures are carefully followed sensory leakage can be kept to a minimum.

Many books on the paranormal include "exercises" for you to develop your psychic powers. But these books never show you how to ascertain if these exercises were beneficial. If any verification is attempted it's usually of the "what do you feel now?" variety, asking you to assess how much better you feel after having done the exercise. These self-assessments are not scientific in the least. There is, for example, no gauge or standard measure to compare your "increased sensitivity" against. This book is different. Only tests that meet strict scientific criteria are included in this book so that you can be sure that the results are meaningful.

2. PROBABILITY

2.1. BASIC COUNTING. Here's a brief demonstration of how easy it is to understand the basics of probability. You aren't required to do any calculations or memorize any formulas to do the tests in the book—the scoring tables have all been prepared in advance and, except for one or two cases where the math is expanded for interested readers, all you need do is count up your hits and look up the result. But you will have to understand what the probability scores mean, so this section is a must read.

To get you started, here's a pop-quiz on basic probability to see how much you already know about the subject. Answer these two questions to the best of your ability. And don't worry about getting the right answer. The idea is to become familiar with probability. You can always grab a pair of dice and some coins and act out the questions if you think it will help you. These are questions common to games of chance, like dice or matching pennies.

(1) If you roll one die one time, what is the probability (or chance) that a five spot comes up?
   (a) 1/6.
   (b) 1/2.

(c) 1.
(d) 0.
(2) If you flip a coin twice, what is the probability (or chance) that it comes up heads at least once?
   (a) 1/4.
   (b) 1/2.
   (c) 1/3.
   (d) 3/4.

The correct answers are (a) and (d).

The answer for Question One is easy to guess, especially if you have any experience playing with dice. You might have already known the answer based on your experience. But you shouldn't be surprised to learn that there is a way to formally calculate the answer to any basic probability problem such as those asked in our quiz: first count how many possible outcomes there can be. Here there are six (one for each side of the dice). Next count the number of ways of getting a *positive response* or *hit*: in Question One a positive response is a five spot. Then divide the number of ways of getting a positive response by the number of different outcomes (which assumes that all outcomes are equally likely). In this case there is only one way to get a five spot and six different outcomes, thus 1/6. Easy!

What if Question One were phrased, "What is the probability of getting a five spot in two throws of one die?" The first thing to recognize is that there are several possible answers. Rolling a die twice can result in either none, one, or two five spots (none on either throw, one on the first throw, one on the second, or one on both throws). The question isn't necessarily clear what is wanted. Does the question want to determine the probability of a five spot on the first throw and some other spot on the second or vice versa? Or is the question asking about the probability of throwing at least one five spot? Which event—one or two five spots—is supposed to be a positive response? It's impossible to know because the wording is not clear. This is the first clue showing how things can go wrong in a parapsychological experiment: the goals of the experiment can be misspecified or confused. If the exact definition of a positive response is unclear then accurate results cannot be scored.

To be concrete, define a success as getting at least one five spot. It's easy to show that the probability of this event occurring is 11/36, which is about 0.31 since there are eleven ways to get at least one five spot and thirty-six possible combinations. Write out everything that can happen if you are confused: you can get a (1,1), (1,2), ..., (5,1), (5,2),..., (5,5),...,(6,6). If, instead, success were defined as a five spot on the first throw and some other spot on the second the answer is 5/36—which is about 0.14[1]. There is a huge difference between the two answers! The first event is *twice* as likely as the second.

Did you get the wrong answer for Question Two? If so, try listing all the possible combinations that can result from flipping two coins. Don't be lazy: do try this. Start with *HH* and go on (where *H* means a head was thrown; *HH* is a head followed by a second head). Got the answer? The four possibilities are *HH, HT, TT, TH*. And, yes, *HT* is different than *TH* because each pair represents a different possible outcome of the experiment. In the first, you get a H followed by a Tail, and in the second you get a T followed by a H. Thus, there are three ways of getting at least one head (*HH, HT, TH*) and four different outcomes. The correct answer is 3/4 (or 0.75 in decimal form). If you don't believe this (because I claim that the events *TH* and *HT* are different), actually try flipping two coins several times and count the number of times you get at least one head. You'll quickly convince yourself that 3/4 is the right answer.

Finding the right answers to this quiz was simple, at least once you got the hang of it. The probability of getting a five spot on a rolled die was one in six because there are six possible ways to roll the die, only one that can result in a five spot. A single coin toss is simpler than two coins tossed because the probability of getting a head is obviously one-half, but it's not too hard to see the results for two coins.

Counting is not always easy. For example, a more complicated problem is to calculate is the probability of getting at least one head and one five spot on two tosses of a coin and three tosses of a die. To solve this, first imagine flipping the coin and then throwing

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[1]Another possibility is a five spot on the first throw and *any* spot on the second, which gives 1/6.

the die. The steps are more complicated but not impossible (for the curious, the answer is about 3 in 7 or 0.434; remember, you can always try it for yourself!).

Basic probability is the science and art of counting. A great elementary probability and statistics book is listed in Chapter 15 for those who want to learn more about the subject. But don't worry, all the necessary counting and probability calculations have been done in advance, you only need to look up a score in a table. These scores are always written in the form of probabilities. Therefore, it's important to understand exactly what a probability score is.

2.2. WHAT IS PROBABILITY? What does it mean to say an event has a certain probability of success? An *event* is some thing or occurrence that can be measured, like a coin toss. Events are not always simple. For example, sometimes a group of smaller events can be considered to be one big event—such as a group of card guessing experiments.

Mathematicians have developed a shorthand to use when discussing probability: the symbol p is a place holder, or variable, and represents probabilities, which are numbers between zero and one (or 0% and 100%, if you like). To say an event has a probability of $p = 0$ means this event can *not* happen. When an event has a probability of $p = 1$ it *must* happen. Other numbers between 0 and 1 reflect the varying degree of uncertainty an event has. For example, $p = 0.50$ (also written as $p = 1/2$) is the chance of a head on a coin toss, assuming a symmetric coin. A decimal value of p can be converted to a percentage by multiplying by 100%. In the example above, the chance of getting at least one head in two tosses of a coin is transformed to $\frac{3}{4} \times 100\% = 75\%$. We also can write this as 0.75. All forms are correct and you are always free to use whichever convention you prefer.

A probability is a number between 0 and 1, but what does this number mean? There is more than one school of thought to describe the meaning of the statement, "There is a probability of p that the event will happen." This modest declaration, that to the average reader may appear obvious, generates deep philosophical questions (fortunately, not discussed in this book). The statement's meaning can become subtle when the events to

be categorized are complex. The situations in the pop-quiz are simple and *discrete*, meaning it's possible to enumerate (count) all possible answers. Counting isn't always easy, but in discrete problems counting can always be accomplished (at least theoretically). What happens when events aren't discrete? Think about this example: what is the probability that rainfall for the month of March will be between 1 and 2 inches? Rainfall amounts are *continuous*, or can be approximated as such, and can take any value greater than 0. Simple counting won't work because the number of different outcomes for rainfall is theoretically infinite (it can be 1.01 in., 1.001 in., 1.0001 in. etc.)[2]. Probability statements for continuous numbers can be formulated, but this involves very complicated mathematics beyond the scope of this book.

The measure of the chance that an event occurs given a large number of opportunities to occur is one definition of probability. This is called the *frequentist interpretation*. In other words, if an event has probability p it means that, in a large number of trials, approximately $100p\%$ successes will occur. Imagine flipping a coin 1000 times where a success is defined to be heads. We would expect about $1000 \times \frac{1}{2} = 500$ heads if the probability of getting a head is 0.50 or 50%. Some coins, of course, might be imperfect and not give 50%. Likewise, it will be the rare experiment that results in exactly 500 heads. Real experiments will have some deviation from 500 heads. The average deviation from the expected value is called the *variance*. Statisticians use variance to decide if the deviation from the expected value is farther than it should be (given what is known about the random nature of the expected value.). This will become clear after the introduction to probability scores.

In some instances the number p actually reflects your best internal judgment: high values of p mean you have more confidence that the event will occur. This interpretation is called *subjective probability* and is typically used when the opportunity for a large number of trials doesn't exist, or when the event is one-of-a-kind (it can be used for events with large numbers of trials too). Here's a good example: think about assessing the probability that you

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[2]Technically, in this example at least, the allowed rainfall values can be truncated to discrete buckets (1 in., 1.1 in., 1.2 in., etc.) but this isn't always possible nor desirable as the mathematics is actually easier for continuous numbers

will ever appear on television in the next year. Perhaps you win the lottery and a crew shows up to film your happy reaction, or maybe you are the victim of a terrible accident that shows up on the 11 o'clock news, or perhaps the cops finally catch up to you. There are many ways you might be on TV. It's up to you to imagine all of these ways. To do so, you bring your experience and judgment to bear, give subjective weight to all the evidence, positive and negative for your appearing on TV, and arrive at a probability (which is pretty low for most of us!).

People unconsciously generate these probabilities all the time: when betting on sports, when deciding to invest in a stock, when considering whether or not to carry an umbrella lest they get wet, and so on.

Probability can also be thought of as a measure of surprise; this is the definition used in this book. The goal of these experiments is to ascertain whether or not psychic powers are real. Each experiment results in a score and that score is reached because you manifested psychic powers or because of simple randomness. A natural measure of ability is the probability of getting the number of hits you got *assuming you do not have psychic powers, that is, assuming the hits were generated by a process which you could not predict*[3]. The smaller the probability (the more hits), the greater the surprise experienced that a score of that size could be produced by chance alone. If the probability is very low it means that there would be great surprise of getting that many hits if you did not have psychic powers. Thus, low probabilities are used as indirect evidence in favor of psi.

The probability of each number of hits is always calculated under the assumption (or hypothesis) that only chance is at work. In other words, a low probability expresses doubt in the working hypothesis that there are no psychic powers—perhaps so much doubt that you want to strengthen your belief that psychic phenomena exist. A large number of hits is hard to reach by chance, thus the explanation for getting that large number may be due to your psychic powers. Of course, a small number of hits has a high probability of being reached by chance. When you get a small

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[3]Unpredictability is the definition of randomness.

numbers of hits your belief in psychic powers should *weaken*, just as your belief strengthened when you got a large number of hits.

To clarify, look at the following table from one of the ESP experiments. In this test a subject is asked to go through a deck of ordinary playing cards and guess each card's value (before it's seen of course). The correct number of guesses (hits) is labeled n. The table lists the probability of getting n or more hits, given that chance alone was at work, that is, that the subject was randomly guessing and not using any psychic powers. A good analogy for random guessing is the card game *War*. Two opponents each shuffle a deck of cards and then each player turns over each card from their deck in sequence. Occasionally, cards from both decks match (that is, the two cards are the same; this is defined as a "war"[4]). The matching in these cases is of course entirely due to chance; no psychic mechanisms are at work. This table can be used to calculate the probability of n or more matches happening by chance in the game of War. For example, $n = 3$ or more hits has a probability of 0.08 (8 out of 100, or 8%). This means that, for a large number of repetitions of the game (going through the deck only once), about 8 out of every 100 games would have instances where there were 3 or more matches.

Three of more matches is not that surprising a result and if such a number of hits were reached in a psychic guessing experiment where you are the "opponent" against "nature" (the randomly shuffled deck), most people would probably conclude that no psychic powers are needed to explain the result. The working hypothesis that only chance was at work has not been adequately refuted.

Say the result was $n = 6$ hits instead. If nothing but chance were operating this result has a probability of 0.0005 (5 out of 10,000, or 0.05%: if you have trouble understanding what a number like "0.0005" means, see the next sub-section on odds). That's pretty low and it means that in 10,000 repetitions (or trials) of the experiment there would only be about five trails that had 6 or more hits. This kind of result casts doubt on the hypothesis that chance alone is at work and gives weight to the idea that some

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[4]In some versions of *War* players need only match a card's numerical value.

psychic force may be in place. The Table starts with $n = 0$ which has a probability score of one: this means the subject *must* get at least zero hits (obviously!). More hits are less probable.

TABLE 1. From the top row pick the number n of hits received. Then look up the probability p of getting this many hits or more below n. For example, $n = 3$ or more hits has a probability $p = 0.08$ of occurring by chance.

Probability of Getting at least n Correct Cards

n	0	1	2	3	4	5	6
p	1.0000	0.63000	0.26000	0.08000	0.01800	0.00320	0.0005

There's one more point that is important to understand about the design of this and all subsequent tables. The table indicates the "probability of n or more hits." The "or more" may be confusing. We could, for example, ask for the probability of getting *exactly* 3 hits, but that's not very interesting because if only chance were at play we could have easily have gotten 4, 5 or more hits[5].

Again, any score, even one with a low probability, may be the result of chance. Think of playing poker and being dealt a hand of all the same suit (a flush). This doesn't happen very often (the event has a very low probability). Flushes are dealt and there is no reason to think psychic powers are involved when they are. Keep this in mind during your next casino visit. Because a flush is rare, it feels *special* to the player who gets one. That special feeling is the basis for coincidences.

2.3. BUT AM I PSYCHIC? The probability scores are *not* the probability that you are psychic, nor are the 1 minus the probability you are psychic. The scores are only one thing: the probability of getting more hits than you actually got given that you are *not*

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[5]In continuous problems the probability of getting *exactly* x hits, where x is any number, is always 0. This is because there are an infinite number of values x could have taken. For continuous problems it becomes very natural to ask for the probability that the result is equal to or greater than x (the answer essentially is an interval, something very much like the length of a line, and is easy to measure).

psychic. That is, if you were not psychic, it would have been un-usual for you to have got a large number of hits, but if you did get a large number of hits, it may be more likely that you have psychic powers (or it may not be because something can always go wrong!).

Exactly how to directly calculate the probability that, given the number of hits you actually got, you are psychic is beyond the scope of this book. However, if you find yourself routinely getting low probability scores on the various tests here, then let me know and I can help you calculate that number.

2.4. THE CHANCE OF PROBABILITY. Probability, chance, and odds express the same thing about some statement (like the chance of getting n hits out of 20), but some people are more comfortable thinking about chances or odds then they are about probability. The probability number in the example just given was $p = 0.0005$, which is pretty small, but perhaps hard to visu-alize. But it can also be stated as "five chances out of 10,000" or "one chance in 2000" or even "odds of 1999 to 1 against," which are numbers perhaps easier to understand. Modern statistical re-sults in parapsychology journals use the probabiltiy (small num-ber) form, so I have used that form in all the scoring tables that follow, so it will pay for you to become familiar with how these numbers look and feel. The following Probability to Chances table will make this task easier. To use it, find a probability of interest from one of the scoring tables, then look across to read the odds form.

Not all probabilities are included in this table, so if you don't see your particular one, find one that is close and use those chances. Or you could always take out a hand caclulator and enter "1 / p" in that order, where p is the probabilty of interest (this is just $1/p$). The number n you get out has the interpretation of "one chance n" as above. For example, suppose you wanted to know $p = 0.067$. We have $1/0.067 = 14.9254$, so you can say that, with a probability of 0.067, you have 1 chance in about 15 of seeing this event occur by chance.

TABLE 2. Probabiltiy to Chance table. Find your probability p of interest in the left-hand column, and the approximate (rounded to the nearest whole number) odds of that (one time out of n) is in the right-hand column. Most of the p column were taken from the scoring tables used throughout the book.

Probabiltiy to Chance

p	n	p	n	p	n
0.64	2	0.08	13	0.0046	217
0.40	3	0.08	13	0.0032	313
0.38	3	0.05	20	0.002	500
0.31	3	0.04	25	0.001	1000
0.26	4	0.018	56	0.0006	1667
0.22	5	0.016	63	0.0005	2000
0.11	9	0.008	125	0.0004	2500
0.10	10	0.0059	169	0.0001	10,000

3. COINCIDENCES

Coincidences are surprising events, circumstances that are judged to be highly improbable and are therefore remarkable. Indeed, coincidences are interesting because they are so improbable. Are coincidences really as implausible as they appear? Could some incredible universal binding energy force cause important events to occur simultaneously, and at a rate more than chance would predict?

Coincidences give people the feeling of incredible improbability, that something truly special has happened. Coincidences feel personal, but they might not be so surprising when examined under what is known somewhat loosely as the *Law of Truly Large Numbers*. That is, a coincidence may sound like an amazingly, even extraordinarily, improbable occurrence, but when the event is viewed under the light of the Law of Truly Large Numbers, the

coincidence ceases to be surprising. [6] Basically, the informal Law of Truly Large Numbers can be stated: no matter how unlikely an event seems in isolation, given a positive probability of occurring and a truly large number of chances to occur, the event will eventually happen. That is, as long as something can happen, given enough time, it will (a sort of probabilistic Murphy's Law).

3.1. Coincidence Table. The following Coincidence Table dem-onstrates this fact. Recall what it means to say an event has a certain probability of occurring. Probabilities for any imagined event are listed in the left-hand column of the table. The next column expresses that same probability in relative frequency, or odds, form, for those who are more comfortable with this method of displaying probabilities. For example, to say something has a probability of 0.1 is the same thing as saying is has a 1 in 10 chance of occurring. You can either use odds or probabilities. For a fixed probability, the number below the headings 10%, 50%, and 90% is the number of times the event must be given the chance to occur so there is a 10%, 50%, or 90% chance of getting at least one success of that event.

This may be confusing, but an example will help to clarify the table's use. Assume a state's scratch-off lottery has 1 in 1000 chance of winning. How many tickets need to be sold so that there is a 10% chance of at least one winner? The event here is a winner on a lottery ticket. The number of chances for there to be at least one successful event is the number of tickets sold. A glance at the table shows that 110 tickets need to be sold. To be 90% sure of at least one winner (one winning ticket) would entail the sale of 2300 tickets. The more tickets that are sold, of course, the higher the chance of getting at least one winner.

This result may appear a little strange. After all, the odds of winning are 1 in 1000. Why wouldn't you need to buy only 1000 tickets before being certain of having at least one winning ticket? The answer is variance. Each time a ticket is bought the chance that it is a winning ticket is *independent* from the previous

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[6]In the field of probability there is a rigorous definition of the Law of Large Numbers which differs from the Law of Truly Large Numbers: the differences are beyond the scope of this book.

TABLE 3. The Coincidence Table is, of course, not complete in that not every possible probability and number of chances is given but it gives a general idea for a wide range of events. It's likely this table will capture most events of interest as the probabilities range from 0.1 (1 in 10) to a miniscule 0.0000000001 (or 1 in 10 billion).

K = thousand, M = million, B = billion.

Coincidence Table.

p	odds	10%	50%	90%
0.1	1 in 10	1	7	22
0.01	1 in 100	11	70	230
0.001	1 in 1000	110	700	2300
0.0001	1 in 10 K	1100	7000	23 K
0.00001	1 in 100 K	11 K	70 K	230 K
0.000001	1 in 1 M	110 K	700 K	2.3 M
0.0000001	1 in 10 M	1.1 M	7 M	23 M
0.00000001	1 in 100 M	11 M	70 M	230 M
0.000000001	1 in 1 B	110 M	700 M	2.3 B
0.0000000001	1 in 10 B	1.1 B	7 B	23 B

tickets[7]. No matter how many tickets were bought, the chance the current ticket is the winner is still 1 in 1000. It's true the expected number of tickets until a winner is 1000, but actual trials (where a trial is buying a ticket) will show some variance: some trials will show a winning ticket with less than 1000 tickets bought, some will have more. This variance can be quantified by the measures of confidence, like those given in the table.

The number of trials, or repetitions, listed in the table goes from 1 to about 23 billion. A billion or two might sound like a lot but it really isn't. A billion trials can be reached in as little as 3 days if, for example, there is one trial for each of about 333 million people for each day—a little more than the population of

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[7]Failure to believe this results in what is known as *the gambler's fallacy.* Roulette players, for example, fall prey to this when they keep betting on a number because it is "due." Numbers are never due. They always have a fixed probability of showing on every spin of the wheel.

the United States. Even an event with an insanely low probability of 0.000000001 (1 in a billion) shows that after about 2 billion chances at least one success is expected at 90% confidence. We'd even be fairly sure of realizing a success after only 700 million chances (50% sure). The idea is that events with microscopically low probabilities will eventually happen if given enough chances.

If this evidence isn't convincing enough let me point out that we're surrounded by events that have very low probabilities which nevertheless happen all the time. The lottery is the best example. In New York, for instance, the odds of winning are about 1 in 13 million. That's $p \approx 0.000000077$, which is a pretty small number.

Millions of tickets for the lottery are sold each week (probably more: the exact number depends on the size of the jackpot). The Coincidence Table can be used to find out how likely it is for a single drawing to have a winner. The probability of winning is close to about 1 in 10 million or $p = 0.0000001$ (this is from rounding up 0.000000077). If 1 million tickets are sold there is 10% chance of at least one winner. If 7 million tickets are sold, a not unlikely number, there's a 50% chance of at least one winning ticket. That's pretty big! And with 23 million tickets sold, a large number but one that might happen when the jackpot is big, gives a 90% chance of at least one winner. The perspective has shifted from an event that appears pretty rare (you winning the lottery) to something that is all but certain to happen (some person, any person, winning the lottery). Keep this principle in mind when examining results from parapsychological experiments because even though a report might claim a very low probability score for an experiment it may not be that surprising because if enough subjects did the experiment it's expected that someone somewhere, by chance alone, will get a large number of hits.

3.2. A LITTLE MATH. Those who aren't interested in the guts of the formulas used to generate the Coincidence Table may skip this section.

Mathematically interested readers can generate more of the Coincidence Table by using the following formula: $n = \log(1 - x)/\log(1 - p)$, where x and p are expressed as probabilities and x is the confidence level expressed as a decimal not as a percentage (x looks like 0.10, 0.50 etc.). n is the number of trials needed to

have a probability x of getting a lease one hit. The logs are natural logarithms (base e).

The values in the Coincidence Table can also be inverted, instead of solving for n we can solve for x given a fixed value of n and p. That is, we know the probability of getting one hit, which is p, but we want to know the chance of one or more hits given n repetitions. The formula for this is: $x = 1-(1-p)^n$ (again, all numbers are expressed in decimal form).

The probability of getting one or more hits can also be viewed as one minus the probability of getting *no* hits. Here is an example. Shuffle a pack of cards and deal one card off the top. You get a hit if this one card is the Ace of Spades. The probability of a hit is 1 in 52 (or 0.0192). That's pretty low. Imagine repeating the experiment $n = 1000$ times. For each trial the deck is shuffled and the top card is dealt. Intuitively, it's easy to imagine that the probability of getting at least one Ace of Spades in $n = 1000$ trails is very near 1 (meaning it's almost certain to happen at least once in the 1000 trials). We can readily envisage that it will be nearly impossible to cycle through this procedure 1000 times and never turn up the Ace. The probability of never coming across the Ace is then about 0.

The example can be quantified in the following Mini Inverse Coincidence Table. For any one trial the probability of getting the Ace of Spades is $p = 1/52$. This inverse formula with $p = 1/52$ and $n = 1, 10, 100,$ and 1000 was used to generate the table. A quick glance confirms intuition: after 1000 trials we are almost 100% sure of seeing the Ace at least once. The formula given can be used to create your own Mini Inverse Coincidence Tables for any value of p that you like.

TABLE 4. Mini Inverse Coincidence Table, useful only for those events that have a $p = 0.0192$ probability. The last symbol $\approx$ means "approximately".

Probability of one or more hits in n trials.

1	10	100	1000
0.0192	0.1800	0.8600	≈ 1.0

3.3. REPEATABILITY. It might be indicative of paranormal abilities to score well on one experiment (that is, to have a large number of hits which will give you a low probability score). Ultimately, however, an isolated low probability score may not be interesting or valuable because we expect that some experiments will produce low probability scores. The Coincidence Table can show why that is true.

Recall first that an entire experiment can be defined as an event in and of itself. Take a low probability score like 0.0001 (1 in 1000) for some experiment. That's a pretty low score. Any parapsychologist would agree that if a subject got a score as low as 0.001 on an experiment it is at least *suggestive* of psychic ability. But a glance at the Coincidence Table shows that if 700 similar experiments were conducted (anywhere in the world, anytime), *there is a 50% chance of having at least one experiment* that will show a score of 0.0001. 700 isn't that many trials, particularly considering that each subject may repeat an experiment many times, and that many researchers are trying the same experiments at different labs all over the country (and all over the world!). Low scores are even less surprising given the *file drawer effect*, which is outlined in Chapter 14. Therefore, in order for a low score to truly be important, you must be able to repeat your performance.

Here's what repeatability can do for a probability score. Suppose a subject got $n = 6$ hits in her first card guessing experiment and further suppose that she repeated her performance on a second experiment and also got $n = 6$ hits. The probability of getting 6 or more hits in one experiment is 0.0005, which is a frequency of less than 1 per 1000. The probability of two successful experiments in a row is 0.00000025 (this is equivalent to multiplying the probability scores together, in this case $0.0005 \times 0.0005 = 0.00000025$). Four successful experiments in a row, each with 6 or more hits, drives the overall probability score to a strikingly low 1 in 16 trillion! A glance at the Coincidence Table shows that probabilities this low are hard to justify in terms of chance: that is, something other than chance would have to be at work, perhaps something paranormal (perhaps not so paranormal, say, cheating). These exceptionally low scores are the kind of evidence that is needed to

persuade the world that psychic powers are real. Therefore, repeatability is *everything* to successful claims of paranormal functioning.

3.4. SYNCHRONICITY. Early in the 1900s the psychologist Carl Jung became intrigued by the idea that coincidences happened too often to be attributable to chance. To explain coincidences, he developed the idea of *synchronicity*, which is a causal theory that tries to explain and account for the multitude of surprising stories that he cataloged (the causal mechanism of this theory have never specified: see Chapter 15 for a discussion of paranormal mechanisms). Jung didn't necessarily say that all improbable events were caused by synchronicity but he certainly implied that some sort of extra-normal causal connection existed—a mysterious linkage which ties the whole of humanity together on some "higher plane."

Synchronicity is a tempting hypothesis because it neatly binds humanity together into a sequence of overlapping and related events. Many people accept synchronicity as fact but its assumptions have never been adequately scrutinized using the power of the Law of Truly Large Numbers. More troubling is that synchronicity (and similar theories) are invariably invoked *after the fact*, that is, after the surprising event has occurred. It is very difficult to assign a measure (like a probability score) to a serendipitous event *after* it has occurred. This is because the number of *identifiable events*, in any given human interaction, are nearly infinite—synchronicity does not provide any guidance about which subset of these events should be examined for improbability.

For example, suppose you learn the definition of a new word in the morning, then later in the day you run into a friend who has a crossword puzzle clue that has been bothering her. Coincidentally, the answer that solves the puzzle is the word you've just learned. Synchronicity? A coincidence? How surprising is this event? Maybe very or maybe only a little. Perhaps you learned the word in a newspaper article and the same person who wrote the article constructed the crossword. Maybe you were doing the crossword yourself. What is more likely is that you've come across the word a thousand times before but never took notice of it. It is

impossible to assign a probability score because accurately count-
ing the set of conceivable results can't be done.

This apparent explosion of possible relevant and surprising
events is known as *multiple endpoints*. The experiments that follow
give concrete examples of multiple endpoints and how dangerous
they are for paranormal experiments.

For the purposes of experimentation, and throughout this
book, a specific event cannot be labelled surprising unless it is
the event *and only that event* specified by the experimental pro-
tocol. For any experiment, and any situation in life, there are
always multiple events that, after the fact, can seem surprising.
It's always possible to reach into a set of data and piece together
some scenario that appears extraordinary to someone. This can
be formally stated as the following empirical conjecture:

Law 1. **The Law of Unsurprising Surprises** *There is al-
ways a way to examine a set of data that will find at least one
event that looks surprising to at least one person.*

Since this always happens it cannot be surprising when such
an event is found, therefore coincidental events are not especially
interesting and are not proof of anything remarkable.

4. Sensory Leakage

This is *the* biggest problem that paranormal researchers face
when designing a rigorous experiment. In the parapsychological
lab much time and effort are expended attempting to eliminate
sensory leakage. The term sensory leakage refers to those com-
monplace, but not necessarily noticed, physical sensory signals
that allow one to falsely conclude that a subject displayed para-
normal abilities. These include the entire range of normal sensory
experiences like hearing and feeling, but also to the routine uncon-
scious mental processing of environmental signals that takes place
while interacting with and deciphering the behavior of others.

Sensory leakage is devilishly difficult to eliminate. For exam-
ple, in designing an experiment to detect telepathy (using one
person as a sender and another as a receiver) the researcher must
be utterly certain that the receiver cannot get verbal or physical
feedback on the correctness of her guesses. If the sender were, say,
smiling each time the receiver got a right answer or perhaps the

sender scratched his ear each time the receiver guessed wrong, these clues might be noticed by the receiver. This subtle feedback would influence the receiver's future guesses. If the probability scores aren't adjusted for this feedback it could falsely appear that the subjects displayed psychic abilities. A numerical example is given in the Chapter 3, but suffice to say here that since we are testing for *extra-sensory* abilities we must make absolutely sure the subjects are not using *normal-sensory* abilities.

The problem of sensory leakage is driven by Murphy's Law: whatever can go wrong will go wrong. Here's an example from dowsing (those unfamiliar with this term may want to read the introduction to the topic in Chapter 9 first). In this test the experimenter hides an object under one of several paper bags on a lawn. The dowser attempts to find which bag contains the object. If he succeeds, we can ask whether it was psychic powers that led him to the treasure or simply his normal powers of observation? If the experimenter walked to only one bag to hide the object, the dowser, consciously or not, may have noticed the tracks in the grass leading up to the correct bag. The dowser may not have overtly registered seeing the tracks, but he may have instead sensed a certain "feeling" that the object was nearby. He may ascribe this feeling to the powers of dowsing. Or perhaps the experimenter left no tracks but he accidentally left the paper bag over the object slightly askew. The dowser might notice that. Or the experimenter might have arbitrarily picked one of the bags instead of using a random choice. Maybe the experimenter is left-handed and so is the dowser and the most natural thing for both people is to the walk to the third container on the left. Who knows?

Here's another good illustration, this time using telepathy as an example. An isolated sender is in one room concentrates on one of four photographs, trying to send a receiver a mental image of what is contained in the chosen picture. After the experiment is over the receiver collects the photographs and tries to find the one the sender used. Would you care to take a guess on how many opportunities for sensory leakage there are in this situation? There are so many that you may grow weary reading them—but read them nevertheless to make sure that this idea sinks in and becomes part of you.

The sender concentrated on only one of four photographs. Is it possible she left a thumb print or a smudge on it? Or perhaps some other subtle mark, a crinkling of one edge maybe? These marks, however insignificant, will not be on the other photographs. The receiver might notice the mark on the target photograph and get a "feeling" about it, maybe without knowing why. It could easily be because she noticed *something* was different about the target, so she picked it.

How was the target chosen? By a random method or by the sender choosing the one she liked best? If the sender and receiver are known to each other, or share similar tastes, it is likely, independent of any psychic events, they might choose the same photograph.

The sender was in another room when she mentally tried to transmit the picture. Suppose she is a fastidious person and left no marks on the photograph. She now has to bring the photographs to another room and hand them to the receiver. In doing this it's possible for her to draw attention to the correct envelope. She could do this by making sure (perhaps accidentally) the target picture was on top the pack. If she were present when the receiver was deciding which photograph was the correct one she might fidget, or hold her breath, or make a noise once the receiver arrived at the target photo. This activity could alert the receiver to the correct photo.

This sort of leakage isn't limited to the sender. A third person could bring the receiver the photo, but if this third person is aware of the target photo there is always the chance that he could leak the information to the receiver by similar non-psychic means.

A subject could use normal-sensory mechanisms in an endless number of ways. Therefore it takes immense effort to design tests to eliminate the chance that a subject could possibly use means other than extra-sensory.

An experimental bias related to sensory leakage is *experimenter effect*. Any experiment in any area can be (and probably has been) biased by experimenter effect. This is when the experimenter influences the outcome of the experiment in the direction he *expects* or *desires* it to go. A common example is in clinical trials of a new drug where a new drug is tested against a placebo (described in Chapter 13). The simplest test starts with a group

of people that are randomly divided into two sets, with one set receiving a placebo and one set taking a new drug. The test assumes that the new drug is no better than the placebo. Clinical trials apply statistical tests and probability scores just as paranormal tests do.

If the subjects aren't divided randomly there could be problems. The doctor might choose (again, consciously or not) to give the new drug to the sicker patients. This would skew the results. The doctor should not know which group is given the placebo and which is given the real one. If he had prior knowledge he might give signals to the placebo group that they're not getting a real drug. These patients may register this and not expect to notice any effect. It's well known that the mind plays a tremendous role in the progression of disease and the body's healing processes[8]. Patients who know they received a placebo would definitely affect the outcome. Likewise, if patients in the group getting the experimental drug knew they were being medicated they might behave differently. If some of their symptoms were subjective or could only be diagnosed by self-assessment, they might, even slightly, exaggerate the effectiveness of the drug.

Here's a cute example to illustrate the danger of relying too closely on any experiment. Meteorologists (weather people) always record the high temperature for the day. A historical collection of high temperatures should exhibit a smooth distribution of values from small to large temperatures. But that is not the case with real data. Instead of a smooth picture of temperature, little bumps appear every five degrees. For example, one at 50°, another at 55°, another at 60° and so on. For some strange reason meteorologists *bias* their reported high temperature readings by rounding to the nearest fifth degree. I was once a meteorologist with the National Weather Service and I assure you I had no bias in mind when I noted the temperatures. Still, after a year, the results were indisputable. I was required to note down the temperature from a digital thermometer whose readout was accurate to the 10th of a degree. These temperatures had to be rounded to the nearest degree before the could be entered into the computer. For example, 72.7°F became 73°F, and 52.1°F was rounded

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[8]This is the entire basis of the placebo effect.

to 52°F. The funny thing was that when I examined a distribution of these temperatures by counting the number of times each particular temperature was noted (0°, 1°, and so on), there were little spikes every five degrees, tiny blips on the distribution at 5°, 10°, 15° and so on. This is odd because the real temperature certainly does not have these preferences. The distribution was built of temperature measurements by several observers over a period of about five years. The only explanation for the five degree bumps is that people, with their inherent five-finger bias, are rounding the numbers incorrectly without being aware of it. I certainly wasn't aware of it, but I still did it.

The experimenter effect is so strong and so well known that an introduction to this important subject is always found in elementary texts on psychological experimentation. There are many ways to eliminate and reduce it but the best is to use "double-blinding." This is when an experiment is conducted so that neither the subject nor the immediate researcher knows what the outcome should be, or what "treatments" are being given to whom. Double-blinding is so crucial that for clinical trials it is *mandated* by the Food and Drug Administration. Notes are given in each test about how you can, if possible, double-blind them.

Sometimes it is nearly impossible to remove sensory leakage and experimenter bias. It's almost a given that some sensory leakage *will* take place in the tests you do. You should expect it, be aware of it, and try to eliminate or reduce it. And after each test, especially successful ones, you should immediately critique yourself and try to find ways in which you could have been inadvertently fooled.

One final word on how important sensory leakage is to avoid. Go to Las Vegas and talk to some of the regular poker players. In order to gain a competitive advantage professional bettors say that they look for the *tell* of the other players. This tell is some subtle movement or behavior on the part of the other player that indicates what kind of hand he is holding. Maybe every time a gambler has two pair or better he starts running his hands through his hair. He might not notice it, but it is a sure bet the other gamblers will. You could be doing the same sort of thing in these tests and not realize it. Be on the lookout for your tells!

5. Your Notebook

It is crucial that all results, positive, negative, and incorrect are recorded in a journal or notebook. A well-organized notebook is far better place to collect and maintain testing results than on some piece of scrap paper or on the back of a napkin where the possibility of making a mistake is enormous.

A historical record is also valuable to keep track of past successes and failures (a failure is when the subject does not get a low probability score on a test). The important thing is to remember the failures and not to diminish their importance or weight when you attempt to recall your performance sometime in the future. Everyone will remember their successes (in the same manner everyone remembers their lottery wins) and forget their failures. Failing to recall failures gives undue weight to the successes you had, making them appear more significant than they are.

Get a notebook now, *before* you start any experiments.

CHAPTER 3

Telepathy

Telepathy: The ability to gather information about someone else's thoughts through non-verbal, non-sensory means. Sometimes known as mind-reading or extra-sensory perception (ESP).

Quick—I'm thinking of a number between one and five! Can you read my mind? Was your guess three? That's the most common guess. And if your guess matched my number maybe you have telepathy. Or maybe not. To convince me you had extraordinary powers, it would depend on how difficult, and how surprising, your guess was. If my number *was* three your hit is not necessarily that surprising because you could have guessed correctly by luck.

The number I was thinking of was e. That's equal to about 2.71828. What? You've never heard of this weird number e[1] and you think I was cheating? Well, I never said my number had to be an integer, that is, a whole number like one, two, three, four, or five. I specified *a* number between one and five and $e = 2.71828$ is certainly in that range.

But maybe you did guess correctly; even so, I wouldn't be terribly surprised. Why? Because you might have used the fact that I was mathematically minded, guessed I was being tricky, and figured I would use an extremely common number, a number mathematicians encounter daily. Another number might have been π (which is about 3.14159). There are lots of mathematically common numbers between one and five, and there are an uncountably infinite selection of other numbers, which it is why it is necessary to set up an experiment, in advance, that allows me to quantify the chances of you and I thinking of the same one

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[1]The number e is a number mathematicians like me meet daily. It is the base of the natural logarithm.

merely by luck. Controlled experiment are needed in which the *only* thing that is left to chance is the guessing (or mind reading) itself.

The end of this experiment, where you guessed my number between one and five, is the first example of a multiple endpoint; multiple endpoints were described in Chapter 2. The test, when I first announced it with a "Quick!" was not completely defined because I never specified the set of possible answers you could choose from. You were free to make any guess you wanted, whether an integer or some strange number and then, after the fact, when I revealed my number, transform your score to something that seemed surprising by arbitrarily defining your choice of possible answers. For example, you first might have thought that the possible answer were the numbers one through five. If you were to say the set of answers included all real numbers, the chance of you guessing my exact number by chance would be exactly 0 (Chapter 2 explains why this is true). That's as surprising as you can get and terrific evidence of psi. On the other hand, I could retort that I limited my choice to e and π, which means a match happens half the time, thus a correct guess is not in the least surprising. This is why only controlled experiments with fixed endpoints are convincing.

Of all paranormal abilities it is probably telepathy (sometimes given the important sounding academic title *anomalous information transfer*) that most excites the imagination, engenders the highest interest, and generates the most enthusiasm. Almost everyone feels they have had some personal experience with various forms of telepathy, whether it's picking up the phone just as someone calls, or thinking the same thought at the same moment as the person you are with. It is the ability that, even if you suspect other psi claims to be false, you are sure to think there is some truth to this one. Parapsychologists think so too and more experiments have been done in this area than any other.

Casual instances of telepathy are common. Imagine you and your sister are together, chatting over coffee about the hair dresser, about the bad hair style your mutual friend Edith effects to wear in public and so on, and then you have a flash, "Say, Judy, I was

just thinking of that time when Bob chopped off half his moustache." Judy says, "Me too! Isn't that extraordinary! I must have been reading your mind!"

Not necessarily.

It may be the case that the more time you spend with someone the more it's likely you will begin to think alike (maybe even look alike) and share the same thoughts. The more time together the higher the chances become that, if you want to think biologically, your brain's neurons fire along identical pathways, using as input similar circumstances and shared sensory experiences, your minds arriving at nearly identical conclusions. Your common history and education, mutual background, and communal social activities help you interpret the world around you in a similar manner. It would be more surprising for two people like this— a married couple, for example—not to be thinking of the same things at the same times for a lot of their life. So how surprising is it that you and someone you know very well both happen to be thinking of the same thing? And how can you quantify the correspondence of thoughts? These tests can help answer that question.

1. Test Number One: The Card Test

This is a very easy and clean test. It is also very traditional in that the first formal tests of telepathy were very much like this. The materials needed are a deck of cards and your notebook. The set up is simple and quick. Cards are used because most people have at least passing familiarity with their shapes and values: this acquaintance is thought to ease mental transmission. The only difficulty may be in securing the help of a friend—but who doesn't want to learn if they are telepathic? The next time you have a party you can assemble people into groups of two and run the test concurrently for each group.

WHAT YOU WILL NEED

- A deck of new clean playing cards (poker or bridge), or a deck of Tarot cards.
- At least one friend.

- Your notebook with two ruled columns (these can be done by hand). One column is headed *Card* and the next *Guess*.
- (Optional) A watch with a second hand.

WHAT YOU WILL DO

Details will be given for an ordinary deck of playing cards. Tarot cards will work but you must first remove the cards of the Greater Arcana (Death and all his brothers) and the Knaves of each suit (pentacles, swords, etc). Only 52 cards can remain in the deck for the probability score to be valid.

(1) Be sure to first remove all jokers from the deck of playing cards. Only 52 cards should remain.

(2) Riffle shuffle the cards *at least* seven times to insure they are thoroughly and randomly mixed. Riffle shuffling is the type where you take approximately half the cards in each hand, held lengthwise, and both piles are flipped towards each other to mix them. Square the deck when this is done. Straighten them out so they are all in one neat pack. For those who are interested, it was mathematically proven that cards should be shuffled at least seven times to attain true randomness (meaning the order is essentially unpredictable to you), so do not be lazy here.

(3) Decide who will be the sender and who will be the receiver. You can certainly swap roles in subsequent tests.

(4) The sender picks up the first card from the deck and notes it down in the *Card* column of the notebook. Shorthand should be used. Assume the first card was the Queen of Spades: QS would be written. Use 'D' for diamond, 'C' for clubs, 'H' for hearts, and 'S' for spades.

(5) The sender then concentrates on the card for a prescribed amount of time (say 30 seconds) during or immediately after which the receiver states their impression of the card.

(6) The sender writes this impression in the *Guess* column next to the *Card* column.

(7) Card number two is selected and the test repeated, and so on.

(8) After all cards are expended the sender then tallies the results by circling the matching results. The number correct is compared with the Telepathy Card Scoring Table for the score.

TABLE 1. Telepathy card scoring table. This table shows the probability of getting n or greater correct matching cards from a deck of 52. Only correct guesses up to 6 are indicated, as it would be highly unlikely to get 7 or more correct. As it is, there is strong telepathic evidence by getting only 4 or more matches—the probability of this happening by chance is only 0.019 (this means it would happen by chance about 2 times for every 100 trials).

Probability of Getting at least n Correct Cards

n	0	1	2	3	4	5	6
p	1.0000	0.6400	0.2600	0.0800	0.018 0	0.0032	0.0005

This is only one possible scoring table because the guessing strategy used by the receiver can modify the probability results. A quick example will show how. Imagine the receiver always said Three of Clubs for each guess. Then she *must* get at least one guess correct, this being the time when the card was the Three of Clubs. All other cards will be wrong (of course). The makes the probability of getting 1 or more correct matches 1, and forces the probability of getting 2 or 3 etc. or more correct matches to equal 0. This table assumes the receiver is guessing freely, each time making a selection from any of the 52 possible cards, and the receiver may guess the same card more than once if she likes.

WHAT COULD GO WRONG

As long as both parties are careful about card handling (no peeking etc.), little can go wrong on this test except for the problem of *feedback*. Feedback is where the sender, consciously or not, informs the receiver if her last guess was correct. Perhaps the sender subtly smiles for correct guesses and frowns or grimaces

for wrong ones. You might think this is not a big deal. Let me give you a simple example of why it is an enormous big deal.

Imagine a deck with only three cards, a Jack (**J**), Queen (**Q**), and King (**K**) (the suits are not important here). I shuffle the cards well and then select the top one, then try to mentally transmit its image to you. You say **J**. What is the probability you are correct? Well, there is one **J** and three cards, so the chance is one in three ($p = 1/3$). I say nothing about whether your guess was correct or not. On to the next card. Again, I pick it up and concentrate. You say, for example, **K**. What is the probability this one is correct? Same thing, one in three. Finally, we do the last card. You pick up a strange vibration, reconsider your first choice, and say **J** again for the last guess (the point here is that you can say any of the three cards because you don't know which cards are still in the deck). The No Feedback Scoring Table lays out the possible scores.

TABLE 2. No feedback scoring table for a deck of three cards.

Probability of Getting at least n Correct Cards

n	**0**	**1**	**2**	**3**
p	1.000	0.700	0.260	0.037

Now let's try the test again, this time with feedback. The cards are shuffled and I concentrate on the first one. You say **J**. "That was a hit," I announce (with a one in three chance of happening, as before). I tell you it was correct. Now the next card. You say **Q**. What is the probability that you are right? It's no longer 1/3 because you *know* the **J** is not one of the remaining two cards. You know, from feedback, that only the **Q** and **K** are left. So the probability of being correct by chance went from 1/3 to 1/2—a pretty big jump.

Let's say your guess was right again, and the second card was a **Q**. I tell you this. This leaves one card on the table. What is the probability your last guess will be right? Well, if you have been paying attention, it is 1! You *know* it is the **K** without having to guess. Therefore, the probability of a correct guess has grown

from 1/3 without feedback to 1 in the case of full feedback. This is an enormous increase!

The Feedback Scoring Table, given below, also depends on the guessing strategy used by the receiver. This is the one that is generated by an optimal guessing strategy, that is, one that uses all the feedback in the most efficient manner so as to maximize the probability of getting three correct guesses.

You can quickly see that the probability, without feedback, of getting all three cards correct went from 0.037 to 0.20, a whopping increase! In other words, if you had got all three correct without feedback it appeared you had psychic powers (based on the low probability score). But getting all three right with feedback is a completely unsurprising result and is not convincing evidence of psychic functioning.

Another thing to note is that, with feedback, you are guaranteed to get at least one card right, while there is only a 70% chance of this without feedback. It is also possible to examine the average number of hits you would get if only chance were operating. For this experiment, without feedback, you would expect about 1 hit. With feedback this doubles to 2 hits.

TABLE 3. Feedback scoring table. The table to use with a deck of three cards when feedback is given. This table represents the optimal guessing strategy using full feedback.

Probability of Getting at least n Correct Cards

n	**0**	**1**	**2**	**3**
p	1.00	1.00	0.60	0.20

It becomes complicated to account for feedback when dealing with a full deck of 52 cards. It can been done, however, and a statistical test has been developed to account for it. This test is too complicated to include in this book but interested readers can look up the reference in Chapter 15.

The point to remember is that, *with feedback* the probability of getting a certain number of hits is higher than without, thus making the possibility of telepathy less likely. If feedback is suspected

the tests must be modified and, in general, this is a very difficult thing to do. The simplest solution is to eliminate feedback.

One potential way to eliminate any possibility of feedback is to separate the receiver and sender. Stationed in different rooms each could agree to concentrate on one card for every minute. As long as everyone's watches are synchronized, this should work quite well. (See the Ganzfeld test for some tips.)

A more insidious form of feedback is pencil reading. A well-known magician's trick is to watch the pencil of a volunteer as he writes down the card to be transmitted. The magician makes his guess by watching the pencil as the volunteer writes. You would be surprised at how easy this is to do. Keep your notebook and pencil hidden. This type of cheating has been used in professional telepathy tests too, and the hapless researchers in these experiments found themselves in the position of reporting spurious positive results. Remember our golden rule: **eliminate all sensory feedback!**

Another form of naughtiness that is often found is misinterpreting or reworking the results after the experiment is over (multiple endpoints again). For example, suppose that you go through this test and get two hits, which is not very indicative of telepathy. But you notice that in five instances every time you guessed a card it came up on the next draw instead of the current one. That is, it appeared you were "seeing ahead" into the deck. You would have got five hits had you counted card-ahead guesses which now looks like great evidence of psychic ability. Wrong! The experiment was not to count how many cards you guessed right in the future but how many current ones you got right.

Here is a specific example of how this post-experiment data mining is wrong. Return to the pack of only three cards, the Jack, Queen, and King. Your goal is to guess the card names as before. A glance at the No Feedback Scoring Table, whose results still hold, confirms that the probability of getting all three guesses wrong is 0.30 (this is calculated using the principle that the probability of getting all wrong is one minus the probability of getting at least one right). Likewise, the chance of getting at least one correct is 0.70. Imagine the order of the cards and your guesses was the following:

Card Order	Your Guesses
J	**Q**
Q	**K**
K	**J**

Notice that none of your guesses was correct. But all is not lost because you notice that, lo and behold, when you guessed **Q**, although it wasn't a direct hit, it was only *one card away* from the one you guessed. Using that logic to rescore the test shows that you now have two hits (the **K** and **Q** were only one card away)[2]. Naively using the No Feedback Scoring Table gives a score of 0.26. This is wrong because you have redefined the experiment and this changes the probability structure of the score. It is the case that the probability of getting at least 2 correct guesses is 0.83, which is three times higher than before (incidentally, the probability of getting at least one becomes 1, meaning you will always get at least one hit).

For a full deck of 52 cards, the probabilities in the scoring table are modified in a similar, but mathematically complicated, fashion—all probabilities increase making it less convincing that you are demonstrating psychic ability.

There is another even bigger problem with the probability calculation just given. It is incomplete. This is because you saw that your guesses were one away, but what if you saw your card was three away? Or four? Or some other bizarre pattern? There is a limitless number of possible patterns that may account for your guessed card being at other places other than the current card. And there is no way to know in advance what they are. All that can be said is that they all modify the probability score towards chance and away from psychic ability. Since there is no way to know in advance the only logical thing to do is to disallow all results *except the exact results the test specified.* If you truly feel you're always better at guessing cards one in advance, set up a new experiment (like the one outlined under precognition) and then interpret the results under that experiment. It is impossible

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[2]It might be argued that the **J** guess was only one card away too, if the set of cards is envisaged as a circular chain. Whether or not it makes sense to ask for this interpretation depends on how many cards you want to get right. If viewed as a chain it is then *impossible* to get any wrong guesses.

to give probability score tables for all the clever ways people can reinterpret results. You might decide to look two ahead, three ahead, or some random number ahead. You may also decide to look ahead and behind. You may change things to look only at the color, suit, or value of the card. There is no way for me to out-guess the creativity of the reader. Therefore, it is imperative that you stick to the original test.

Unfortunately, many published results in prominent parapsychological journals fall into the trap of redefining the experiment after the fact. These researchers post-interpret the results looking for significance. Some, wiser than others, do not try to claim "statistical significance" when they do this, and instead claim the results are "intriguing," but this circumlocution doesn't change the bad result into a good one. Attaching or not attaching a significance number does not make the practice right. You cannot, under any circumstances, claim results are meaningful when you did not set out to test them. Again, if you feel you are obtaining results that are not associated with the experiment, set up a new experiment specifically to test for these results.

Of course, if you're doing this test at a party or other informal get-together you cannot disallow the possibility of cheating. After one too many pinot grigios it's impossible to tell what one of your friends might do. It's human nature to want to impress other people and the temptation may be too great to "bend" the results in the right direction. This could all be in fun, but don't fool yourself. If you feel you have a friend who is particularly adept, schedule a time with her alone and do the test under rigorous conditions.

The last big thing that can go wrong, and often has, is bad or incomplete randomization. If you fail to shuffle the cards correctly, particularly between trials, you will seem to do better than chance, but this may only be because you have, inadvertently or not, memorized certain patterns in the cards. Shuffle well to avoid this.

2. TEST NUMBER TWO: THE ZENER CARD TEST

Zener cards were invented by a student of J.B. Rhine, a famous parapsychological researcher, and were used in lieu of regular playing cards because it was felt that some people were more sensitive to pictures and symbols than to numbers. Scoring is also easier. These cards have the familiar five different designs: a cross, a circle, three wavy lines one atop another, a five sided star, and a triangle. For your test, you may use these five figures, or any other five you feel comfortable with. Try different ones until you feel you hit upon five symbols or pictures you feel you can best "pick up."

WHAT YOU WILL NEED

- 25 clean and undamaged thick 3×5 cards which are used to make your own Zener cards: some New Age bookstores sell Zener decks and it is recommended to buy them if possible.
- One friend.
- Your note book with ruled columns (these can be done by hand).

WHAT YOU WILL DO

(1) Lightly mark each of the index cards with the Zener symbols. Each symbol is marked on five cards. Be sure that no ink bleeds through to the other side while marking, or that you cannot see the image through the card when held up to a bright light. Also be sure that you don't press so hard that the impression can be seen.

(2) Shuffle the cards to insure they are thoroughly and randomly mixed.

(3) Choose whether you or your friend is the sender (the other, of course, becoming the receiver).

(4) The sender picks up the first card from the deck and notes it down in the first column in the notebook.

(5) The sender then concentrates on the card for a prescribed amount of time (say 30 seconds) during or immediately after which the receiver states their impression of the card.

(6) The sender writes the impression in the column next to the first card.
(7) Card number two is selected and the test repeated.
(8) After all cards are expended the sender then tallies the results by circling the matching results. The number correct is compared with the Zener Card Results Scoring Table to get a score.

TABLE 4. Telepathy Zener card scoring table. The probability of getting n or greater correct matching cards from a deck of 25 Zener cards. Only correct guesses up to 12 are indicated. Guesses less than 6 have a probability greater than 0.40 and are not very interesting, so the have been eliminated from the table.

Probability of Getting at least n Correct Cards

n	6	7	8	9	10	11	12
p	0.380	0.220	0.110	0.050	0.020	0.006	0.002

WHAT COULD GO WRONG

What can go wrong here is essentially the same as what could go wrong in the first test. Additional hazards are bad, torn, or smudged cards, so that they are marked in some way. Pencil reading is still a problem here as is other forms of feedback. Be careful!

Unfortunately, to this date, no reliable evidence exists that Zener cards are any better at eliciting positive psychic results than playing cards. But they are of historical interest in parapsychology and you should know about them.

You could easily modify this test to keep in the spirit that images, perhaps even cherished images, are better transferred by thought than ordinary playing cards. Instead of cards you can use five photographs, each distinctly different from one another.

For each repetition your friend would shuffle the five pictures and then pick one at random. She would concentrate on this picture and you would attempt to guess which one it was. It's best to label each picture A, B, etc. so that you can more easily write them down during the test. Scoring is the same as above.

What could go wrong is that the pictures start to wear by the constant shuffling and you may be able to discern which is which just by looking. Be very careful to guard against this. Some sort of screen between you and your friend would help. Also be sure to adequately shuffle the photographs each time. Then take the top one. Whoever shuffles should not be allowed to guide the decision of which photograph is eventually chosen in any way.

It's also no good getting "close." You have to name the photograph *exactly*. Just because Sally appears in A and D and you said A when it was actually D your friend trying to send you, you cannot claim a hit (multiple end points again). You are not trying to identify Sally, you are trying to identify the photograph as a whole. If Sally is confusing to you, get a different photograph and begin again.

3. Test Number Three: The Ganzfeld

This is, without a doubt, the most elaborate test in this book. I don't expect that you will actually try it, but you should read the details carefully as this is the hottest thing going in parapsychological research at the moment.

It was thought by some researchers that excessive and even ordinary external sensory input, such as normal background noise and even regular room light might hinder telepathic reception so, the reasoning went, if these distractions were removed or at least toned down, subjects might concentrate more easily and thus perform better. From this thinking came the so-called *ganzfeld*, or total field. The goal was to create or sort of uniform and minimal sensory field. This is how the minimal sensory field is achieved. Ping-Pong balls are chopped in half and put over the subject's eyes. A red light is shown on the balls to try and create a uniform visual field. Headphones are put on the subject too, and white noise is played through them. The subject is allowed to acclimatize and prepare themselves to receive psychic impressions. While the subject (receiver) is lying in his room, a sender in another room is shown either a video clip or a photograph. The sender then tries to telepathically transmit the image of this photograph to the receiver.

The subject is allowed to concentrate for a set period of time, and during this time he is encouraged to talk freely, saying anything that comes to mind. After the time is up the receiver is usually shown four photographs or video clips, only one of which is the one used by the sender. The receiver has to pick the one he thinks the sender was using. He has a one in four probability of guessing correctly just by chance. So to be convincing this test, just like the others in this book, has to be run multiple times.

Daryl Bem and Charles Honorton, the parapsychologists who pioneered the technique, have claimed a group of experiments showed hit rates that averaged about 34%, which has a probability of much less than billions to one of occurring by chance. This would seem to be a significant score, and when these results were published there was much excitement (not to say rejoicing) in the parapsychological community. Their paper appeared in the prestigious main-stream journal, the *Psychological Bulletin* which added weight to their claims. Unfortunately, more recent results by Julie Milton and Richard Wiseman in the same journal show that Bem and Honorton's claims don't stand up to close scrutiny. As always, lack of consistency and difficulties with replication are enormous problems in parapsychological research. [3]

WHAT YOU WILL NEED

- At least three friends.
- 20 photographs or paintings, supplied by one of your friends, all of which differ in content. It would be best if you have never seen any of the photos.
- A ping-pong ball carefully sawn in half (no, I am not kidding), along with a few tufts of a cotton ball.
- An electronic "white-noise" generator, now commonly sold as "sleep aids." Preferably this can be attached to headphones which you will wear.

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[3]Bem and Honorton's results were based on the suspicious statistical technique of meta-analysis. What makes it suspicious is that the analysis requires selecting a set of experiments to group. The results are heavily dependent on this set. Milton and Wiseman applied the same technique to a wider set of experiments and found that the hit rate dropped to the range expected by chance.

- 25 opaque envelopes large enough to hold the photographs. 20 will be immediately used, the remaining 5 will be used at the end.
- Two watches.
- A tape recorder.
- Two very quiet rooms with low levels of ambient lighting.
- A coin and five large rubber bands (large enough to encircle a package of four envelopes).

WHAT YOU WILL DO

(1) Before the experiment is to begin, the ping-pong ball must be sawn in half. *Do this very carefully!* A loose cloth draped around the balls lightly secured in a vise and a hack saw seems to work well. You may have to experiment with the best approach. Try not to tell your local sporting goods salesman what you are doing with the balls.

(2) Attach a little cotton or other soft material around the sawn edges of the ping-pong ball. These half balls will later be placed over your eyes and you want to avoid soreness or injury that can result from rough edges.

(3) Experiment with keeping the halves in place over your eyes as you rest in a comfortable position. An elastic band can be attached and wrapped around your head, for instance. It is possible to eliminate the balls altogether, but some feel they are necessary. I suggest at least trying them.

(4) Two rooms must be prepared. In the one you will be in, set up the white noise generator and the lighting. Low lighting is best. In some experiments, a red light is shown on the ping-pong balls to create a uniform visual field. A flashlight covered with red tissue paper works, but securing it so that it constantly shines on the pin-pong balls may be difficult.

(5) Set the tape recorder in the room you will be in.

(6) Your first friend, who will not actually take a part in the experiment seals the 20 photographs, in random order, into the envelopes. The photographs are lettered *A* through *U* and the envelopes numbered 1 through 20.

Your friend notes which envelope receives which photo-graph in your notebook. The markings on the envelopes should be on the inside so that no one could guess which is which.

(7) The envelopes are randomly mixed and divided into five piles of four.

(8) The first pile is stacked. Your first friend then flips a coin. If it is heads he takes the first two envelopes from this stack. If tails, the second two. Whichever stack is chosen is called the selected stack. He then flips the coin a second time. If it is heads he selects, from the designated stack, the first envelope. If tails, the second. The final choice is then marked with an **X** on the outside on the envelope.

(9) The first stack is then regrouped and rubber banded to-gether with the envelope with the **X** on top.

(10) The remaining four stacks of envelops are treated in a likewise manner until he has five stacks of four envelopes. They are marked one through five.

(11) These five stacks are brought into your second friend who will act as the sender in the experiment.

(12) Now you are ready for the experiment to actually begin. At the top of the hour the sender takes the first packet of envelopes and removes the photograph from the envelope with an **X** on it.

(13) Meanwhile, also at the top of the hour, you switch on the tape recorder. Your third friend should be with you to operate the machine.

(14) For 15 minutes you will try to visualize what the sender is thinking about. Let anything come into your mind and freely talk, expressing your thoughts, so that the tape recorder can capture them.

(15) At the end of 15 minutes your friend will notify you, and will also announce the fact the first test is done so that the tape can hear it. Meanwhile, the sender also notes that 15 minutes have elapsed and then moves on to the next set of envelopes, grabbing the next **X**.

(16) The cycle is repeated all five times.

(17) At the end, the first friend takes the first stack of en-velopes and again removes the one with an **X**. He places

this into one of the five unused envelopes being careful to mark the same number inside the new envelope that was on the inside of the first (the **X**ed) envelope. This is necessary because the five stacks of envelopes will later be given to your third friend (who was in the room with you) for the judging process. No marks must be obvious to eliminate the possibility of indicating that your friend selected a particular photograph. To this end the sender must be extremely careful that no marks are placed on the photograph from his handling it. *This is extremely important!* This is the biggest possibility for sensory leakage.

(18) Each stack of envelopes is thoroughly shuffled and re-rubber banded.

(19) The stack of envelopes is brought the to third friend. He opens all four envelopes of the first stack. You and he then have the option of going back and listening to the tape and recalling your comments. From these you must select one of the four photographs that you believe you were receiving. Your friend notes this down and you proceed to the remaining stacks.

(20) When you are finished you total the correct impressions, finding a score from the Ganzfeld Score Table.

TABLE 5. The Ganzfeld Probability Scoring Table. All guesses up to 5 are indicated.

Probability of at least n Correct Impressions

n	0	1	2	3	4	5
p	1.000	0.760	0.370	0.100	0.016	0.001

As you can see, you really must get at least four correct impressions for there to be any real evidence of telepathy. Even still, getting four or more right would happen about twice in every hundred experiments. Getting five or more right would happen only once in every 1000 experiments, if telepathy did not exist, and thus is more convincing. As always, repeatability is the goal.

To be convincing you need to consistently duplicate your performance. You might switch sending and receiving duties for a second experiment.

WHAT COULD GO WRONG

Everything. This is an extremely delicate and complicated experiment and there are dozens of places where sensory leakage could occur and where other slip-ups can happen. The list is almost endless and I hesitate to give all the possible dangers. Since modern parapsychological researchers point to the ganzfeld tests as the best evidence that exists for the reality of psychic abilities, you should investigate this topic thoroughly. I want to leave the listing of all the things that can go wrong as an exercise to the reader. Do try this. Think hard about each stage of the test. Think about the markings of the photographs, and how they are put into the envelopes. What about when the envelopes and photographs are handled? Could communication between the judge and the sender have any effect? How about the randomization method used in deciding the target photograph. Is it adequate? Can anything go wrong with it? What about being "close"? There will be a tape recording of impressions that might mean anything. How was the judging done? Did the judge clearly decide which images were being received by the subject before he knew what the actual target was? Did the judge give something away when he looked in the notebook?

And on and on. The more you think about this the less surprising it becomes that someone might find a flaw in the test protocol and be dissatisfied with the results.

4. FINAL WORD

Telepathy is a very popular belief. More people want to believe in telepathy than in any other phenomena. This is unfortunate because wanting to believe in something can very easily influence experiments and bias judgements about their results. There have always been a multitude of popular books related to telepathy. New ones appear almost daily. Most recycle the same material or are overflowing with stories about this guy who had a dream about a train crash, that guy who helped detectives solve a crime.

Anecdotes, however, are of not much use in deciding the validity of a particular phenomena.

A recent book purports to tell all about the U.S. military's involvement with the testing and training of psychics for use in espionage (or ESPionage as the author cleverly calls it) and warfare. This actually happened: the government, in its well-known wisdom, supported a multi-year study to discover whether psychics could telepathically discern what enemy leaders were thinking. The tests didn't work, and some argue, they should never have been attempted. That they were only indicates how appealing the idea of reading an enemy's mind is.

Telepathy continues to be tested. In the experiments, pictures are sometimes replaced by sound or other controlled events. There's been a unsettling lack of positive results. This has motivated researchers to evolve test protocols in an effort to capture their elusive subject. Some experiment only under a full moon (this is not a joke). Others measure the magnetic lines of force emanating from the earth, hoping that alignment with them will be a help. Still others take into account meteorological variables such as temperature and humidity. I could go on and on, as it seems likely researchers will go on and on inventing new possibilities of possible psychic functioning.

Most of these tests are well-intentioned and arose out of the examination of previous test results. What do I mean? Suppose some researcher's original test failed. The researcher, not wanting to accept this failure, returns to the data, pores over it, and begins to notice that when the temperature was over 80° and the relative humidity under 70%, an intriguing numbers of hits were realized! Enough hits that the results would have been more than significant. If he is wise he realizes the results of the present test cannot be used to support this hypothesis, so a new test is designed, one that adequately controls for the weather or other external variables[4].

What is curious, though, is how this researcher ever thought to look at temperature and humidity, or any other external condition, in the first place. The Law of Unsurprising Surprises is in

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[4]A variant on this scenario has actually taken place and is not the product of my imagination.

full force and it is therefore expected that he should find some surprise in the data, some place where the results look promising. Any biological or physical mechanism theorized to account for psychic phenomena has to explain why temperature, humidity, etc. are important. To the outsider, and even to many insiders, it may look like these researchers are desperate, and trying to find something, anything, that will salvage their belief that telepathy works.

Of course, this sort of thing doesn't happen solely with telepathy, but with all psychic phenomena that have been subjected to comprehensive testing.

CHAPTER 4

Clairvoyance

> **clairvoyance:** The ability to see or to know about things without the aid of the normal senses. Derived from the phrase *clear seeing*.

Generally, or at least technically, clairvoyance is the ability to see objects or events that cannot be seen by normal biological methods, such as events that happened in the past or will happen in the future. But this chapter will use a narrower definition and specify clairvoyance as seeing an object or event in the present. Clairvoyance is also separated from telepathy, which is also seeing an object or event that exists in the present but the manner in which the object or event is seen is by reading someone's mind. To be specific: clairvoyance will not mean reading someone's mind. The specifications of clairvoyant abilities in this chapter are mirrored in professional parapsychological research. Delineating (paranormally) seeing an object or event in the present from paranormally seeing an object or event in the past is not specifically necessary, but it is desired to design tests as are found in the literature, so the common distinctions between clairvoyance and other abilities will be kept.

There have been many attempts in the literature to design tests for clairvoyance, most of which are unnecessarily complicated and very difficult to interpret. These complicated tests usually have test subjects (not the clairvoyant) travel to remote locations. The clairvoyant receiver, sitting in the lab, tries to describe where the test subject is, typically by dictating his impressions to a judge, who then rates how close this description is to the actual place. This approach makes it very difficult to determine what a hit is. Just about any description can be interpreted to mean anything if someone is clever (or desperate) enough. To remove these kinds of difficulties, one of the tests that follow is similar

to the standard tests, although with a twist that takes away the subjective nature of the judging.

Three tests are developed in this chapter. The first is a simple card test that you can do by yourself. The second is one that you could also do on your own that, if met with success, would be very convincing of clairvoyant abilities. This is the so-called book test. The final test is a simple remote location test and is the one that is most similar to current professional tests. There are even notes on how to adapt this test to a telephone test, one that formally investigates the experience that some people claim to have, of knowing who is on the phone as it rings.

A careful reader or someone very familiar with the differences between psychic phenomena would note that the first two tests of clairvoyance could also be interpreted as tests for precognition. In one you are guessing a card you cannot see and in another the word on a page not yet known. It's possible to imagine that you can either envisage the words on the page by clairvoyance or perhaps peer into the future and glance at the time when the page is revealed (via precognition). The effects are similar but the idea here is that, using the card test as an example, the sequence of the cards (or events) is predetermined. You actually pick up the card and try to clairvoyantly see what is on the reverse, and you are not really trying to look into the future. The point is a fine one and probably not worth arguing about because if you pass these tests repeatedly you definitely are demonstrating some kind of power, precognitive or clairvoyant.

1. TEST NUMBER ONE: THE CARD TEST

Many, if not all, the tests developed for testing telepathy can be readily adapted to testing for clairvoyance. In fact they are somewhat easier because you do not need a friend to transmit her thoughts. Instead, you will use your concentration to discern the value of hidden objects, in this case, the value of cards.

WHAT YOU WILL NEED

- A deck of new clean playing cards, or a deck of Tarot cards with the Greater Arcana and Knaves removed. The arcana are the cards like Death and Love (consult the

TABLE 1. Clairvoyance card scoring table. The probability of getting n or greater correct matching cards from a deck of 52. Only correct guesses up to 6 are indicated. As before, there is strong clairvoyance evidence by getting only 4 or more matches—the probability of this happening by chance is only 0.018 (this means it would happen by chance about 2 times for every 100 trials). A close reader will realize this is the same scoring table as the telepathy test, as the two experiments are very similar.

Probability of Getting at least n Correct Cards

n	0	1	2	3	4	5	6
p	1.0000	0.6300	0.2600	0.0800	0.0180	0.0032	0.0005

tarot instructions if you are unsure what these cards are). The goal is to be left with only 52 cards at the end.
- Your notebook pad with four ruled columns (these can be done by hand).

WHAT YOU WILL DO

Details will be given for an ordinary deck of playing cards.

(1) From the deck of playing cards be sure to first remove all jokers.
(2) Riffle shuffle the cards *at least* seven times to insure they are thoroughly and randomly mixed.
(3) Concentrate on the top card for a prescribed amount of time (say 30 seconds, although the exact timing is not crucial) during or immediately after which you write your impression of the card on the note pad.
(4) Carefully set aside the card *without* looking at it.
(5) Card number two is selected and the test repeated with card number two going on top of card number one.
(6) After the pile of cards is exhausted, go backwards through the deck noting down the actual card in the column next to your impression. The number correct is compared with the results table to get a score.

WHAT COULD GO WRONG

It is important, as in the telepathy test, that you do not see any of the cards until after you have made your all your guesses. If you do happen to glance at some you have the problem of feedback. If you didn't read the feedback example, go back to Chapter 3 on Telepathy and do so now.

You must guard against dirty, torn, or bent cards as these minor indications may give away the card's value. Buy a new deck for this test to greatly reduce the chance of this happening. Also watch out for randomization problems: shuffle well.

Other than these minor things, very little can go wrong with the clairvoyance card test, which is what makes it very nice. Although, watch out, professionals have been fooled many times with tests such as these and when they go bad they do so for the reason listed above (they also go bad because of cheating, but I know you won't be doing any of that!).

2. TEST NUMBER TWO: THE BOOK TEST

This is an advanced test, not in form, but in ability. If you really feel you are clairvoyant this test should be no problem for you. This is also a good experiment to try on a friend who claims to have clairvoyant powers. But it's also designed strictly for non-professionals This is because the set up mimics a very popular professional mentalist effect (a mentalist is a magician who specializes in tricks intended to mimic psychic abilities). Be wary, then, of having a mysterious person showing up and volunteering to take the test. A mentalist can tell you to pick any book at random, select any word you like, and he will proceed reveal it to you, letter by letter. It's a very clever trick (of which there are many ways of accomplishing: books and books have been written on this subject for professional magicians).

WHAT YOU WILL NEED

- A bookstore (well, owning one would be nice, but just going to one will suffice). A library will also do very nicely.

WHAT YOU WILL DO

(1) Go to your local bookstore and pick out a book at random. Start in the history section, for example, and grab any book off the shelf.

(2) Use your clairvoyant powers to discern the word on the page number listed in the next step. If you are testing a friend, have her tell you the word before she opens the book. *Write it down first!* Even for yourself, you should note it down. We all have bad memories.

(3) Turn to page 37 and look at the first line of complete text (chapter headings and figure and table heading do not count as text—use only paragraphs of words).

(4) Count to the third complete word and this is the word you should have been looking for with clairvoyant powers.

(5) Repeat the test 10 times, keeping track of hits.

It is impossible to accurately develop a probability score for this test. After all, it may be easy to get one word correct, particularly if it is a common word like "the" or "and." I did a test of this one time and got two hits out of ten (one was an "and" and one was a "the") so you can see it is not terribly impressive. You could redesign the test in the following way. For step four, instead of the third complete word you should ask for the first complete word of five or more letters. This greatly reduces the chance of coming across a common word (but doesn't eliminate it, unfortunately). With this change, if you still get two or more hits I would have to say you have done very well (my subjective probability for this happening is less than 0.001—yours may be different).

WHAT COULD GO WRONG

The selection of books should be random. After all, you could wander into the romance section and how rare would it be to find the phrase "heaving bosom" on the page? So start in the history section, go on to mathematics, then gardening etc. In fact, to do this properly you might want to disguise the book, perhaps by covering it with a cloth. In this case you will need a friend to help you and bring you the books. This is done to reduce the chance you are "judging the book by its cover." For instance, if I see I have in my hands *The Big Book of Garden Flowers* how unlikely would it be for my guess of the words "soil" or "bulb" to appear on the page?

The same page number is used throughout this test (that is, for every book) and it should stay that way. This is because, no matter what word you picked it is bound to turn up in about any English language book. So it is no fair searching for "nearby" pages, or even nearby words, to see if you have a match. You are looking for third word on page 37 and that is that. Along the same line, say you clairvoyantly pictured the word "catatonic" but the actual word was "catapult." Close enough? The letters almost match. What if the word on the page was "turgid" and "turbid" or "silliness" and "silly"? Close to catatonic in meaning. But no, none of these are "close enough." You can either see the exact word or you cannot. We cannot allow multiple endpoints. If you really have clairvoyant powers and you can see part of a word there is no reason you cannot see the entire word. You are not getting "vibrations" or feelings about a vague word; clairvoyance means being able to see things remotely and you therefore should be able to see the entire word. If you allow yourself to count words that are similar to the word you foresaw, then it is possible to transform almost any word to the word you specified (multiple endpoints once more). For example, say I guessed "transportation" but the actual word was "steam." Not very close, is it? But wait! Steam is used to drive engines in trains and boats, and trains and boats have everything to do with transportation. A hit! I can even go on about how I "saw" things moving or felt the vibrations for changing. But *none of this is convincing after the fact.* None of it.

This point is emphasized because it has been the failing in nearly every clairvoyance test to date. Interpretations after the fact must never ever be allowed because it is too easy to cheat. And yes, wishful thinking counts as cheating yourself.

3. TEST NUMBER THREE: THE REMOTE LOCATION TEST

WHAT YOU WILL NEED

- A friend.
- Six locations, each distinctly different from one another.
- Two watches.

WHAT YOU WILL DO

(1) Go with a friend to each of the six locations: each location should be far from the others and each should be distrinct in some way; say, a church and a grocery store and so on. Number the locations clearly on a piece of paper so there is no confusion after the test about which location was which.

(2) Your friend, now alone, then rolls a die and writes down the number shown on the die on a sheet of paper. She rolls again and writes the second number under the first. She does this 8 times. Your friend must keep this list secret.

(3) The test begins when your friend goes to the first location specified by the roll of the die. She arrives at an agreed upon time, say noon, and stays for an agreed upon time, say fifteen minutes. You and your friend each have a watch which you have sychronized, so you don't need to worry about the time.

(4) You sit in a room in your house and try to see—clairvoyantly—where your friend is. Write this impression down and compare it to the master sheet which numbers all six locations. Decide which location best fits your mental image and write this down.

(5) Your friend then returns and goes out again to the next location, or she goes to the next location, arriving there at another prespecified time, say 12:30, and you again try to discern where she is.

(6) At the end, tally up the number of correct guesses and compare them against the scoring table below.

If you like, this test can even be done inside your own home, provided you have a home that is large enough to hold six distinct locations. The test can even be extended over multiple days, as long as the list of locations already visited is kept secret.

WHAT COULD GO WRONG

The standard curse of bad randomization is always a possibility, but maybe in a more subtle way here. Perhaps your friend rolled, somewhere in the sequence of rolls, the following sequence: $[\ldots, 4, 4, 4, \ldots]$. She decided, "Enough fours!" and changed one or

Table 2. Clairvoyance remote location scoring table. As you can see it wouldn't be at all unusual to get 3 or 4 correct guesses. You would expect to see about 4 or more hits out of every 100 experiments run.

Probability of Getting at least n Correct Guesses

n	0	1	2	3	4	5	6
p	1.0000	0.7700	0.4000	0.1300	0.0310	0.0046	0.0004

two of them to other numbers. This is forbidden! This completely upsets the randomization and the consequences can be disastrous, in the sense that there is no way to account for the way your friend selected her numbers and the way you guess them. Ordinarily, feedback during the test would not be problematic. Your friend is perfectly free to tell you whether your previous guesses up to the current trial were correct or not. But if she played with the randomization, feedback could give you some sort of indication of where the next location is. You may know *not* to guess the same location twice in a row.

If you're doing the test in your home it's possible to give away your location by ordinary means very easily. If you're downstairs and your friend tries to sneak upstairs you may hear her on the steps for example.

Incidentally, the test can be modified into a psychic Telephone Test. Instead of six locations you have six friends call you at appointed times, say every ten minutes. You try and guess who's calling before you pick up the phone. The order in which they call is handled the same as in deciding the order of the locations above. Scoring is identical.

But you must also guess *before* you pick up the phone. Why? I'm thinking of the numerous old detective shows in which the bad guy calls and leaves a message for the detective. The good guy, the detective, then notices something odd about the tape. Usually, it's something obvious like a fog horn heard in the distance, or maybe the sound of a factory whistle. The detective then knows where the bad guy is, but it certainly isn't because of clairvoyance. The same thing can happen in this test. Your friend cannot call you

when she is at a location. After all, how hard would it be for you to guess she is at the grocery store if you hear in the background, "Clean up on aisle 12!"

It's also no good getting "close." Say you only had 3 correct guesses (with a probability of 0.13), which is not very indicative of clairvoyant abilities, but that, when you go back through your answers when you said *bathroom* the actual location was *kitchen*. You conclude that because both locations have sinks, and that's what you pictured, you now have 5 correct (with a probability of 0.0046). Success! All of a sudden it looks like you have psychic powers! No! If the two locations are so similar, remove them and choose another. You cannot go back after then fact and redefine what is meant by a hit.

4. Final Word

Three different kinds of tests were given in this chapter, each reflecting the same sorts of tests that one finds in the professional literature. All address very different situations but I think all nicely illustrate how your imagination might mislead you into finding false positive results.

If you were doing the card test seriously my guess is you really did see the card's faces when you went through, regardless of whether or not your guesses were correct. You could picture very clearly the Nine of Diamonds, for instance, as you picked up a card. When you went back through the deck to count your successes, it's possible that on the ones that were hits you said to yourself something like, "You know, I really did see that one. I remember how *vivid* it was." Chances are you won't recall how vivid your guesses were for those times you were wrong. This can lead to problems in your interpretation of the test results.

The vividness of your thoughts also comes to play in the other experiments, particularly the Remote Location test. You may feel, when comparing notes with your friend later that she may even recall "feeling something" on those times you got your hits.

Maybe.

This post-test playing around is the kind of thing some people do to explain why they didn't do well on a test. They say, "Well, I didn't get a great total score, but I really did *feel* something on

the two I did get right." Thus, the failure has been turned into a success. But, as you might expect, this kind of post-experimental reinterpretation does not explain anything. If you're allowed to say you only felt something on your hits, it's never possible for you to fail! Think hard about that. No matter how many correct guesses you got, if you're allowed to only count the ones you in which you felt something then, in essence, you are always scoring 100% (the probability score for that is 1).

There must be room in the test for failure. You must allow the possibility for the experiment to show that you do not demonstrate the intended powers. One way for you to guard against the very natural tendency to explain away your failures is to put a little star next to guesses that you really *feel* something (as you guess; not after the fact). When the test is over you can examine if the strength of your impressions matched up with the success of your guesses.

There is a formal way to test this, although it's more complicated than before. Go through the above test as given, and keep track of your strong impressions by marking those guesses with an asterisk.

Your sheet for an experiment with 10 repetitions might look like this:

Now the going gets a little tough because there are more steps to scoring than before. You have to supply the numbers a and b in this table:

For our example $a = 1$ and $b = 3$. We now look to the Skill Scoring Table.

Here is how to score:

(1) First calculate your a and b as in the example above.
(2) Now find your value of a in one of the **a** columns.
(3) After finding a look to the right of its value in the **b** column.
    (a) If your b is equal to this number or smaller then you have shown that your correct guesses and your feelings are connected.
    (b) If your b is larger than this number you *do not* have any connection.

TABLE 3. An example of how your guesses and strong feelings might look in an experiment with 10 repetitions. The ♯ indicates those times you felt strong vibrations, while 1s are hits and 0s are misses from the test (it can be *any* test in this book, not just the Clairvoyance test.

Strong Feelings Check Sheet

Feel Strong	Correct
	0
♯	0
♯	1
♯	0
♯	0
	0
	0
	1
	0
	0

TABLE 4. Determination of parameters for the Strong Feeling Score. *a* are those times when you marked a ♯ and had a 1 (a hit); while *b* are those times when you marked a ♯ and got a 0 (a miss).

Strong feeling parameters

$a =$ Those times when you *Felt Strong* and were *Correct*
$b =$ Those times when you *Felt Strong* and were *Wrong*

In our example, $a = 1$ and $b = 3$: since our b is larger than oour a, there is no connection between your feelings and your correct guesses. If, instead for example, our a were 13 and our b 5, there would still be no connection; but if our b was 4 or less, then there would be.

Incidentally, I shouldn't say you have proven a connection if your b is smaller than the number in the **b** column, it only shows

TABLE 5. Skill scoring table. The **a** columns represent various values of a you might get for experiments with up to 52 attempts (the table is larger than need be so that you can use it generally, for experiments of all types, not just clairvoyancy tests: for example, it can be used in the card guessing experiments too). If you got $a = 0$ you can stop immediately because this automatically shows there is no connection between your correct guesses and your feelings. Likewise, if your b is greater or equal to your a you can stop because there if no connection between your correct guesses and your feelings. The value of a has to be at least 4 before you have any chance of proving a connection (in this instance your b would have to equal 0).

Skill Scores for Various a and b.

a	b	a	b	a	b	a	b	a	b
		13	3	25	11	37	19	49	28
		14	4	26	11	38	20	50	29
		15	4	27	12	39	21	51	30
4	0	16	5	28	13	40	21	52	30
5	0	17	6	29	13	41	22		
6	0	18	6	30	14	42	23		
7	0	19	7	31	15	43	24		
8	1	20	7	32	16	44	24		
9	1	21	8	33	16	45	25		
10	1	22	9	34	17	46	26		
11	2	23	9	35	18	47	27		
12	3	24	10	36	18	48	27		

that a correspondence like yours happens with a probability of 0.01 or less. This is a small number, but not a dramatically small number, so to be decisive you are going to have to be able to replicate your success consistently. There is a way to calculate the exact probability—the necessary calculations are given in the next section.

4.1. A Little Math. This section is only for those mathematically-inclined readers who don't want to use the table above and want to compute the exact probability.

You have to use this somewhat daunting formula to compute your score. Unfortunately, there is no easy way around this, but to make it easier I suggest doing it in small steps and keeping track of each step on paper. Here's the formula:

$$(1) \qquad X = 2a \log(2r) + 2b \log(2(1 - r)),$$

where $r = a/(a + b)$. Note: if $b = 0$ then the term on the right $(2b \log(2(1 - r)))$ must be set equal to zero. Compute X if and only if $a > b$ (this means if a is greater than b). If a is less than or equal to b then you can immediately conclude that your feelings and correct guesses are *not* associated. If our example given above is modified so that $a = 2$ and $b = 0$, it gives $r = 1$ and $X \approx 1.39$ (remember the term on the right is set to 0 as $b = 0$).

Higher values of X are more indicative that your feelings and your correct guesses are truly correlated. Even if you were just randomly guessing and indiscriminately assessing your feelings you can imagine that you'll have some matches by coincidence. That is X will larger than zero just by chance. It's possible to draw up a probability for each number of hits, that is, for each value X can take.

Here is a table showing the probability for X. This table is used in the same way as the other scoring tables in the book.

TABLE 6. Probability levels for X. Not all possible values of X have been included; only odd numbers up to 11 are indicated. If you get an even number less than 11 you can roughly extrapolate between the two p values. This won't be exact, but close enough.

Probability of X Being Greater Than n.

n	1	3	5	7	9	11
p	0.1600	0.0420	0.0130	0.0041	0.0013	0.0005

This method can be used for calculating X in any experiment for *any* number of attempts.

CHAPTER 5

Precognition

> **precognition:** The ability to see or know things before they happen, i.e. a premonition Sometimes called the gift of prophecy, although that meaning is typically confined to religious predictions.

Telepathy may be the best known psychic phenomenon but precognition is the most exciting. The idea that someone could accurately foretell the future is wondrous. To be able to know what is going to happen before it does is an exciting and possibly powerful ability.

Precognition is restricted to seeing events that *have not yet happened*. Paranormally-discerned knowledge about some incident that has already happened, even an event that was unknown to you, is not precognition. The details of a historical event may be paranormally acquired through clairvoyance, telepathy, or psychometry, but not through precognition. Only events that have not yet happened can be ascertained using precognitive powers. For example, you are comfortably seated in your favorite chair, settled down for the night with the book *So, You Think You're Psychic?*, when suddenly a vivid image impresses itself upon your mind: that the next day a car will violently crash into your gate post and destroy it. If, subsequently, a car does obliterate the gate post your vision may be said to be precognitive. It also might not be, and for many reasons, chief among them is the the vision you had, when viewed by a dispassionate judge and incorporating all relevant background information, was not that surprising or unexpected.

Say you live near a road with a lot of traffic and car crashes are common, perhaps even frequent. In such a case, a vision of another car crash isn't especially surprising. Maybe you have worried about a crash many times, the gate post being hazardously

exposed to traffic or especially beloved by you. In this situation how can you claim that you were really foreseeing this *particular* crash, from among all the times you imagined it but it did not happen? You really can't. Even so, the idea is alluring and it is tempting to ascribe yourself precognitive powers.

Precognition is known by other names. In ancient times a person with precognitive abilities was called a prophet or oracle. The most famous of these prophets (non-biblical) is Nostradamus. His writings are perpetually consulted and not a year goes by without several new books published on the subject. Many people take these re-interpreted prophecies extremely seriously, so it is beneficial to discuss them for a moment.

The difficulty with Nostradamus' prophecies (and similar prognostications issued by more modern oracles) is that his pronunciations are far too vague to test. Generations have poured over his writings attempting to interpret his confusing prose. These prophecy buffs attempt to identify specific predictions and tie them to specific events that have already happened, in a sense attempting to find a map from his inexplicit musings to explicit historical occurrences. When these would-be scholars satisfy themselves that they have interpreted a passage correctly they use this self-measured closeness of fit to infer Nostradamus was prophetic.

The process works something like this[1]. Suppose Nostradamus said, "In the year of the Earl there will be a fire in the City of Angels." An enterprising historian, noting this passage, pores through the Los Angeles fire reports and notices that a guy named Earl, a fry cook at a fast food restaurant in Watts (which is in Los Angeles, the City of Angels), carelessly spilled some grease and caused a fire, ultimately resulting in a appearance by the fire department. Nostradamus has a hit! Never mind the differences between "the year of the Earl" and a fry cook named Earl, or that the place "City of Angels" is vague (it might be taken to mean, among other places, a city where there are many churches), or that a fire in a small restaurant hardly qualifies as an event significant enough to have been foretold hundreds of years in advance.

_____

[1]Most times the sequence is inverted from this example. Notable historical events, like the *Titanic* disaster or large military battles are decided upon first, then a passage in Nostradamus' writing is found to "match."

Even if you believe that this particular example could be construed as a hit, the approach used to interpret the passage is not valid because you cannot use your own guesses as evidence that your guesses are right! Anyone given sufficient ingenuity can force any passage to mean anything they want. Independent evidence is needed to qualify the interpretation methodology as successful. For instance, what no one, not one single author, has yet to do is to show how Nostradamus' writings can be used to predict events that *have not yet happened*. It is these types of prophecies that can be given as evidence. If someone, based on their reading of Nostradamus, predicts a series of clearly and unambiguously defined events will happen, and they subsequently do, then they will have proved Nostradamus was on to something. No one ever has. Chapter 15 references a fantastic book on this controversy.

Incidentally, there have been so many attempts at interpreting Nostradamus' writings that multiple events are said to have been foretold using the same passage—and, of course, only one of these, if any, could be correct. You too could have a go at fitting events to Nostradamus' prophecies for fun and for profit. Simply pull out a passage or two, fit them to any historical events you like, using any standards you want, using any method of interpretation you desire—don't worry about being 100% accurate—and then sell those interpretations on the market. It's done all the time.

This controversy nicely illustrates why designing tests for precognition must be done carefully. You want to be sure you are actually predicting events *in the future*, and not trying to fit your prophecies to events that have already happened.

Some simple unambiguous tests are given below. The first can be done immediately and simply. The others require more planning and effort, but, if met with success, are convincing because they are realistic.

1. Test Number One: The Dice test

WHAT YOU WILL NEED

- One die.
- Optional: A large plastic drinking cup (large enough to hold the die).
- Your notebook.

WHAT YOU WILL DO

(1) Concentrate and imagine which face of the die will be uppermost when tossed.
(2) Write this impression in your notebook.
(3) Toss the die. Try, like they do in Las Vegas, to toss the die on a hard surface, one that gives it ample opportunity to bounce around as randomly as possible and will allow it to lie flat at the end of the role.
(4) Circle the number if and only if you were correct.
(5) Repeat the test 20 times.

TABLE 1. Precognition dice scoring table. The probability of getting n or more correct matching guesses from 20 tries. Only correct guesses up to 10 are indicated. There is strong evidence of precognition by getting 8 or more matches—the probability of this happening by chance is only 0.011 (this means it would happen by chance about 1 time for every 100 trials). As you can see, getting even 6 hits isn't that impressive, although it might seem that way when the problem is first considered.

Probability of at least n Correct Matches

n	3	4	5	6	7	8	9	10
p	0.6700	0.4300	0.2300	0.1000	0.0370	0.0110	0.0030	0.0006

WHAT COULD GO WRONG

The most likely thing that could go wrong with this test is bad randomization. This means that you could have bad or worn dice that do not fall with equal frequency on all sides. There is a complicated test[2] that can be used to determine the quality of the

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[2]This test is included in the book, but in disguised form in Chapter 6. The test is encapsulated in the Psychokinesis Dice Scoring Table #3. To test a die for soundness, Test One for psychokinesis should be followed (without, of course, any attempt at psychokinetic manipulation. Follow the procedure for calculating X. A bad die will have an X larger than 10.

die, but the best way to overcome poor die quality is to purchase professional dice from a gambling supply source. Professionals use only professional dice, and to be convincing to outsiders (if you suspect you're able to display precognition) you will need something better than household quality dice. One thing that helps randomize the dice is to use a cup to shake the die in before throwing. Another is to throw the die on a hard flat surface. Be as careful as you can.

As with telepathy (and all the other experiments), there are no "close calls" allowed. The number you predict for the current throw must match the die for a hit. You are guessing the number that will turn up on each throw and not the number that came up on a previous toss or will come up on the throw after the current on. You can only score the results that were planned.

Any reader truly confident of her abilities can head down to the casino and get in on a game of craps, a situation which turns this toy experiment into a very real one. This suggestion is made in earnest because of the oft made claim that psi results are better (and more reliable) when people have an emotional stake in the outcome of the experiment. It is difficult to imagine not having an emotional stake when your money is on the line.

2. Test Number Two: The Dream Test

Many people feel that their dreams are prophetic at least part of the time. Some parapsychologists argue that it may be that precognitive talents can only manifest themselves while people are in a completely relaxed dream-like state. While this might be the case, designing a test for dreams is very difficult for many reasons (see Chapter 13). People often forget their dreams, or if they can recall some of their dream they not be able to focus on any particular prediction. Future events, in the dream state, are presented in a random or non-linear fashion, and there is an infinite number of possible future events to choose from. Which of these infinite choices is the dream foretelling? Because of this it is impossible to score the precognitive abilities of dreams that rely on real life circumstances. Any such score would involve subjective probability assessments on the outcomes of each of these infinite events (so as to estimate the probability of the one event that was

selected over the others). Instead of trying to attack this problem head-on, a much simpler test that emulates a real life situation is created. Of course, no test can simulate emotion-bearing real life events exactly. This test is at least unambiguous and simple to perform.

Each day the subject will roll one die one time at the same time and be rewarded if they are able to correctly predict, through their dream, the number that will come up.

WHAT YOU WILL NEED

- A soft bed.
- A die.
- A item of food of which you are particularly fond of.
- Choose a time that you will roll the die.
- Your notebook.

WHAT YOU WILL DO

(1) Sleep and dream.
(2) When you *first wake up* in the morning immediately write down what number you believe will come up when you roll the die later in the day. This impression is based on what you feel the dream is telling you. If you did not dream of the number or you do not feel strongly about any particular number then skip the test for this day. **Important!** If you do not feel strongly about a number and elect not to do the test you must decide in the morning *before* you roll the die and not after.
(3) Each day, at the same time, you will roll the die. If it comes up the number you dreamed about you get to eat the food item you picked before. Some people theorize that precognitive abilities manifest themselves better (or only) when human reward or risk is involved. This theory is made use of by rewarding you when you guess correctly. Risk can also be tried (if you are willing to invest in a pain inflecting device—only turned on when you guess incorrectly).
(4) Do this dream test for 20 nights. As you can opt out of the test for any day these 20 nights need not be consecutive. At the end of the 20 nights add up the number of

correct guesses and use the Precognition Scoring Table from the section above.

WHAT COULD GO WRONG

Be alert for bad randomization. The ability to opt out of the test is nice but be wary of falling into the trap of using this condition to cheat. Cheating is easy because you can say to yourself in the morning something like, "I think the number will be six, but I'm not sure so I don't think I'll do the test." Then, later in the day, perhaps out of habit, you roll the die anyway and it comes up a six. It is tempting to count this as a hit. But it is not. Likewise you may not roll the die, note the number, and then interpret the dream at that time. The prediction *must* come before the die is rolled. In short: if you do not have a feeling in the morning and do not write your prediction down *it does not count!*

If you do choose to roll the die no matter how you feel, then be sure to keep track of your impressions. Put a star next to those times—but still before you throw the die!—in which you feel strongly that you will do well. You can then use the skill test scoring table at the end of the Chapter on Clairvoyance to see if your feelings really do predict your abilities.

Also try to keep the same reward item throughout the test. Changing foods mid-stream may effect the nature of your dreams (for instance, going from pizza to ice cream to scotch may have a decided impact). It is possible to eliminate the food rewarding phase of the experiment completely (if, say, you were worried about your diet).

3. TEST NUMBER THREE: THE HORSE TEST

Betting on horses or stocks (and similar items) is a sure, real test, and one that virtually eliminates the possibilities of sensory leakage, feedback, and cheating (unless you bet or trade on inside information!). In this sense, this test is ideal. It has all the aspects of real life—risk and reward—because it is real life.

WHAT YOU WILL NEED

- Money.
- Courage and confidence in your precognitive abilities.
- Your notebook.

WHAT YOU WILL DO

(1) Either go to the horse track or, if you do not like the idea of gambling on the ponies, call your favorite stock broker.
(2) Pick a race and concentrate on which horse will win (or which stock will rise). Write down the result in your notebook, also noting how much money you won or lost.
(3) Watch the race or the stock ticker (if you have the temperament).
(4) Either collect your winnings or curse your fate.
(5) Repeat the test 20 times (or however many times you can afford!) and count the number of times your horse came in first.
(6) If you want to do this without money, simply follow the horse racing column of your local paper and use the scoring table below.

TABLE 2. Precognition horse race scoring table. Remember that this table assumes that all the races you are scoring ran with 8 horses. If there were any races that had less they must be excluded from the final tally. To be convincing, you're going to need to get about 7 races correct, which only happens about 8 times out of every 1000 experiments by chance.

Probability of at least n Correct Matches

n	**2**	**3**	**4**	**5**	**6**	**7**	**8**
p	0.730	0.460	0.230	0.095	0.031	0.008	0.002

This test, though somewhat unusual in tone, is quite legitimate. A difficulty may arise when scoring the actual horse races. Without any prior knowledge about any race it is clear that each horse has a one in eight chance of winning (if there are eight horses entered). Of course, in practice these odds are not uniform as they depend on the qualities of the horse, experience of the jockey, and condition of the track. Odds of winning each race are posted by the track and are modified as soon as gambling begins. The final

odds are determined based on the amount of money bet on each horse.

Your must ignore the posted odds and bet on the horse that you perceive will win. If you have any knowledge of the posted odds the Scoring Table is not valid. This is because the odds that are given by the track are based (in part) on expert opinion as to which horses have better and and which worse chances of winning. These odds have been shown to have some predictive value. That means that using the posted information gives gamblers an edge over guessing randomly which horse will win. The Scoring Table was prepared assuming you will guess randomly and that each horse, to your knowledge, has a one in eight chance of winning.

Also in a real race, bets can be made that a horse merely shows or places (comes in second or third). This type of betting is not of interest in this test. Instead, bet to win only. Of course, betting with real money is optional as you can always bet fictional money (keep track of this in your notebook). Track results are usually posted in newspaper's local sports column. Be careful because looking at the odds beforehand from these columns is cheating as it will be impossible to not let the printed odds influence your decision—as will explicit knowledge of any horse's past performance.

The probability of getting n or more correct matching guesses from 20 tries is indicated in the Table. Only correct guesses up to 8 are given. There is strong evidence of precognition by getting only 7 or more matches—the probability of this happening by chance is only 0.008 (this means it would happen by chance about 8 times for every 1000 trials). Sometimes a horse is scratched from a race and a replacement is not entered. This changes the odds of each horse winning to 1 and 7, and ruins this scoring table. Only count those races in which 8 horses ran.

WHAT COULD GO WRONG

If this test is done with money nothing can go wrong: there is no possibility of feedback, or of sensory leakage, or for anything else to malfunction. It is an ideal test because if you have precognitive powers you win and if you do not you lose. Betting your own cash should be incentive enough to concentrate on the experiment and bring out any latent psychic powers you have.

This statement can be made stronger: if someone really believes they have precognitive abilities there is no excuse not to try this test. Consistent winning will do more to demonstrate the truth of precognition than any possible statistical test.

Fictional betting, that is, gambling only on paper can be problematic. This is because the subject must not learn of the posted odds of the race before it is run. The odds will clearly list a favorite horse. Using posted odds is better than betting using random guessing (although using the odds certainly does not guarantee consistent winning). Knowledge of these odds could increase the probability of picking the winning horse and would invalidate the scoring table. If these odds were known they could be incorporated into a modified probability score, but there is no easy way to do this in advance. Therefore, be very careful about not looking at the posted odds, or a race columnist's choice of a favorite, or of even overhearing racetrack tips from the crowd (if you go to the track). After the race is over it is harmless to learn of the odds only if none of the horses who ran in that race will run again in a future race on which you bet. Imagine, after race one, learning that the horse *Mangy Trot* had odds of 150 to 1, meaning almost no chance of winning. In race two *Mangy Trot* is to run again. If you knew the odds from before you could let that influence you in the second race.

There is no need to limit the test to horse races. Any sporting event will do. Try cleaning up on the office football or basketball pool. Any event in which there is a clearly defined winner and loser will work.

The stock market is even harder to model than sports. A proven investment strategy based on precognitive intuition would certainly interest Wall Street more than a horse picking system would interest your bookie so perhaps it's more interesting to concentrate efforts on creating a test for picking stocks. However, devising a score to rate stock market predictions is very difficult so I suggest sticking with the horses unless you really want to play the market with your own money. Even then interpreting the causes of rises and falls of your portfolio is not easy: simply coming out ahead is not proof of precognitive abilities. For example, the stock market has natural ups and downs and buying

stocks during an up-swing will result in a positive balance even without precognition being used.

Here is a simple stock market test, given to show the difficulties of calculating a general probability score. You will pick a stock and predict whether it will rise (or stay the same in value), or fall. A single stock can be tracked each day of the experiment or, for quicker scoring, many stocks can be picked over one day. Stocks have a natural time measuring point—the market closing price at the end of each day. Any number of days for the prediction can be used, but for illustration assume one day. Assume also that 20 stocks are predicted for one day. Imagine these are a group of popular internet stocks. The stocks are then split into two groups, those which you predict will go up (or stay the same) and those which will go down. At the end of the day count up the number of correct guesses. You can use this table to score the predictions.

> TABLE 3. Precognition stock scoring table. This table assumes that all the stocks you've picked are statistically independent, a term which is described below. You could also use this table for other random events where the event has a 50% chance of occurring, such as coin flips. It cannot be used for events such as rain or snow because those events do not have a 50-50 chance of happening. Hit totals less then 10 are excluded because they are not that interesting, meaning that they are very probable to occur by chance. To see this, try an experiment where you flip a coin 20 times and then count the number of heads as hits.

Probability of at least n Correct Matches

n	10	11	12	13	14	15	16	17
p	0.5900	0.4100	0.2500	0.1300	0.0600	0.0210	0.0059	0.0013

What can go wrong in the interpretation of the score is that stock prices may not be independent from day-to-day or be independent as a group. Certainly the groups of stocks picked for this

example—internet stocks—are not independent. Lack of independence, or dependence, means that when one stock goes up the others also tend to rise. Followers of the stock market know this kind of behaviour is seen all the time. Groups of similar stocks rise or fall in a correlated manner. *Correlation* is a measure of the similarity of a groups of object's movements. In statistics this measure runs from negative to positive one. A positive one means that, in this case, if one stock goes up the other also go up with certainty, i.e. they all go up together. It also means that if one goes down they all go down. A negative one means that as one stock goes up the others go down with certainty. That is, the one stock does the exact opposite of the others. A zero means if one stock goes up the others rise or fall independently. There is no information about the behaviour of one group of stocks to be had from examining the behavior of another. Think of flipping a coin. The results from one flip do not influence the next flip. This is zero correlation and independence.

In this example, assume a moderate and typical correlation of about 0.7 between all stocks. So when one stock rises (or falls) the others also tend to rise (or fall), but not with certainty. Look at what this correlation does to the scoring table.

> TABLE 4. Precognition correlated stock scoring table. This table should only be used for events that are jointly correlated with a value of about 0.7. I assume most people won't know how to calculate this, or how to calculate correlation for any group of stocks. So this table can only be used for this example. As you can see, and as is explained in the text, there really isn't any number of hits that would be surprising.

Probability of at least n Correct Matches

n	14	15	16	17	18	19	20
p	0.340	0.290	0.240	0.190	0.140	0.096	0.048

For example, with positive correlation, getting 15 or more hits went from a somewhat surprising probability of 0.021 to a not so

surprising 0.29. Even getting 20 hits is not that surprising: that would happen by chance about 5% of the time. Interestingly, if the correlation was changed to a moderately high, but not unheard of, 0.9 the probability of getting all 20 jumps to 33%! You can see how correlation, if unaccounted for, can lead one to believe there is psychic ability when nothing more than chance operates.

In general, a scoring table can be built for any correlation that exists, but a compact set of such tables cannot be completed in general because there is no way to tell what type of data one might have. There are also various types of data that exhibit what is known as *nonstationary correlation*. This means the correlation changes over time. If the stochastic structure and nature of this change is known it can be modeled and accounted for, but it's beyond the scope of this book.

To highlight: there can be correlation through time as well as through "space" (20 stocks on one day can represent a kind of space). That is, just as all the internet stocks could move up or down together, it's equally possible that a single stock will more likely rise if it has risen the day before (and drop again if it has dropped before). This correlation through time must also be accounted for in scoring.

4. FINAL WORD

Interestingly, one would think that if precognition were a consistent or at least large effect then real life experiments of the type outlined above would be carried out each and every day by those individuals that possess precognitive talents. Imagine, for example, you have these psychic abilities. What would you do with them? For example, would you try to divine the upcoming lottery numbers? Or predict which stock will be the next to rise? Or say which team will win the next world series? There would be nothing stopping you from placing a few bets, bets with no risk because you know what the outcome will be. So what is stop anyone with this kind of ability from using it in such a way that they accumulate both power and wealth? Nothing.

If precognition exists there should be a group of people who are exceptionally powerful and wealthy (the power and wealth, of course, accumulated through their precognitive abilities). They

would have no need to hide their powers either because they could dodge any potential threat to themselves by looking into the future and then avoid it[3].

That we don't see such groups of powerful people can be described by what is known as the *Planned Relent* effect. This theory explains what the world would—and should—look like if people genuinely had precognitive powers. The absence of such indicators, classes of extraordinarily powerful psychic sages, seems to be strong evidence against the idea that precognition works, at least at the large scale.

It could be argued that precognition is a small effect and not always reliable or accurate and that this deviation from certainty accounts for the lack of groups of powerful psychics. But this doesn't work because a person with precognitive powers would still come out ahead on bets in the long run even though their abilities didn't always work. A perfect analogy to this are casinos. Some games only have a slight edge, maybe as low as 1% or even lower. This slight advantage in the probability of the house winning accounts for the fact that casinos rake in *billions* each year. The same would hold true for imperfect precognitive bets. The psychic would still come out ahead in the end. It may take a little longer, but it would still happen.

Arguments that people who have precognitive abilities can only use them for the greater good do not carry any weight. Such limitations on psychic powers would have to be built into the relevant explanatory biological and physical models. It also means defining precisely what "the greater good" means (greater to whom?). That psychics could never use their powers for personal gain and can only use them altruistically (say, to warn of danger) goes against all history of human behavior.

The altruism only argument fails on two counts. The first is that if people could only do good with their abilities we would not have anyone else die in airplane crashes, say, or by driving off bridges. These unfortunate potential accident victims would

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[3]Well, maybe. If the future is set and cannot be changed a psychic could not avoid his fate, but neither could he take advantage of his power for the type of lucrative bets outlined above. Precognition in a preordained universe is like turning to the last pages of a detective novel first to see whodunit. It spoils the fun and the ending remains unalterable.

have been warned of their impending doom and destruction by beneficent seers. Clearly this is not happening. Yes, there are lots of anecdotes to say that it does, but none rigorously confirmed. One would think that some sort of government bureau would have been set up by now, employing precognitive psychics, whose function would be to issue disaster reports much like weather forecasts warn against tornados and hurricanes.

The second reason the altruism argument doesn't work is human nature. For example, I'm telling you that if I had precognitive powers I certainly would use them for personal gain. I'd pile up a lottery win or two, use the money to make a fortune on the stock market and then begin to accumulate political power. It'd be Emperor William the First before long. And I'm generally a nice guy. There would have to be people who, if capable, would be far more ruthless in the exercise of their abilities than me.

Since we don't see these kinds of things, it follows that any precognitive powers must be negligible or non existent. Nevertheless, the allure of even the hint of having this ability is strong so reliable tests, like those given here, are essential. To this date no test like these have ever been convincingly passed.

CHAPTER 6

Psychokinesis

> **psychokinesis:** The ability to move or influence physical systems using only powers from the mind. Sometimes known as telekinesis, psi powers, or simply pk.

An old joke has a comedian asking an audience, "Everyone here who believes in ESP raise your hands. Now, who believes in psychokinesis? Okay, raise *my* hand." If you get it you understand just what pk is and why it's so hard to prove. If you don't get it, keep reading.

A theory is that some people have the ability to influence physical events by concentrating and emitting mental energy. This energy interacts, in some mysterious manner, with physical objects and causes them to change in some way. This change is usually a movement or an increase in temperature, although other effects have been claimed such as an alteration in a local magnetic field. In the 1970s several individuals gained prominence by claiming to be able to bend spoons and other metal cutlery simply by staring intently or stroking at the silverware. Prominent parapsychological laboratories touted these individuals widely in the popular press and on television. But the official tests designed by these institutions never panned out. Despite several claims of initial success the published tests were never able to withstand close scrutiny. The investigators did not lose heart, however, and new research directions (involving smaller phenomena) were soon found.

Strangely, the psychokinetic mental energy emitted by the mind is not, or never has been directly measurable, only its effects can be seen. These effects are not limited to bent tableware. Some practitioners claim to be able to alter local magnetic fields, so much that they can influence (deflect) a compass needle. Other

individuals claim to be able to remotely move objects using only their impressive mental energy.

This new energy does not behave like all other known forms of energy (like electricity and gravity). Most energy fields decrease in strength as the distance between the source of energy and thing acted upon is increased (this decrease happens fast too, and is usually proportional to the distance squared, meaning that, for example, an object 5 feet away feels the energy at only 1/25th the strength as the same object 1 foot away). There isn't a consensus, but PK energy has been said to span all distances without loss of power, to operate on all sized objects with the same efficiency, and even operate through time!

Currently, no biological mechanism is known to exist that would account for the mind to emit energy in a form that would cause objects to physically move. The physical sciences have also been of little help in classifying this mystery energy. Some novel theories involving the use of quantum mechanics have been suggested, but these generally are unsophisticated, but hopeful, theoretical stabs in the dark (but please see the material on quantum mechanics in Chapter 14).

Modern parapsychological tests typically involve random number generators (RNGs) of some kind. RNGs spit out random numbers (usually between the value zero and one) and subjects are told to concentrate their mental energies on the RNG so that the distribution of numbers from the RNG is changed from its usual pattern. For example, a uniform RNG will, about 50% of the time, give numbers that are greater than 1/2. The other half the time they will give numbers less than 1/2. Subjects are asked to concentrate and force, through pk, the average output of the RNG to have more than 50% of the numbers be greater (or less) than 1/2. The results from these tests are frequently ambiguous because there is always the possibility that the RNG could have caused the change in number distribution on its own. Unfortunately, the results from the tests given below will be no less ambiguous as they rely on statistical interpretation. Such statistical devices are a necessity, however, when measuring *micro-pk*, or psychokinetic events of the imperceptibly small, because no large scale events can be witnessed (as in macro-pk events, such as spoon bending).

Micro-pk is where most current psychokinetic research focuses today.

This statistical ambiguity would disappear if the psychokinetic effect becomes so strong (*macro-pk*) as to preclude the need for statistical tests at all. Test Two is designed with this in mind.

1. Test Number One: The Dice Test

A standard feature of psychokinesis tests is to have the subject attempt to influence the outcome of a random event. Dice can be used and are an excellent example of a cheap portable RNG. Dice are thrown and the subject concentrates on forcing a particular spot to be turn up. Say the spot the subject chose was the six. If, in the collection of trials, more sixes come up than would be expected by chance, this is taken as evidence of psychokinesis. Modern tests use the computer, although many of these computerized tests suffer from an inherent flaw which will be fully explained in the section on what can go wrong.

WHAT YOU WILL NEED

- A die.
- Your notebook.

WHAT YOU WILL DO

(1) Decide on a number from one to six.
(2) Throw the die 36 times, each time attempting to cause it to land on the number you chose.
(3) At the end, count the number of successes and consult the scoring table below (the table is identical to that used in the precognition die test).
(4) Alternatively you could decide on high numbers (4,5, and 6) or low numbers (1,2, and 3) and try to influence the throws so that more highs or lows than are expected by chance come up. Also use 36 attempts but score using Table Two.

There is yet another way to interpret this test. It is possible that the subject could not force a particular number or set of numbers to come up more than chance would expect, and could instead change the entire distribution of outcomes away from its natural tendencies. That is, some spots would, if psychically influenced over a number of throws, come up more than expected,

TABLE 1. Psychokinesis Dice Scoring Table #1.
The number of hits start at 8 because hits less than
8 are very probable and thus not too interesting.
Getting 12 or more hits happens by chance once
out of every 100 experiments.

Probability of at least n Correct Matches

n	8	9	10	11	12	13	14	15
p	0.24	0.13	0.07	0.03	0.01	0.004	0.001	0.0003

TABLE 2. Psychokinesis Dice Scoring Table #2.
The number of hits start at 22 because hits less
than 22 are very probable and thus not too inter-
esting. Getting 26 or more hits happens by chance
about 6 times out of every 1000 experiments.

Probability of at least n Correct Matches

n	22	23	24	25	26	27	28	29
p	0.12	0.07	0.033	0.014	0.006	0.002	0.0006	0.0002

some less. The subject wouldn't necessarily focus on any one spot
to come up, but would instead change the whole set of throws
away from randomness (which means nothing more than "uni-
form expectation of each spot" here). For this test the expected
number of times each spot comes up, assuming symmetry of the
die, would be six. That is, six one spots, six two spots, etc. Now,
for any given test the rolls will not have exactly six of each spot,
but will vary slightly. Some will have seven, others five and so on.
This deviance from the expected value can be measured, although
it's slightly trickier to do so.

The procedure for the experiment remains the same except
the subjects needs to write down, for each spot, how may times it
came up differently than 6 during the 36 throws. Then multiple
each of these six numbers by itself (square each number). Then
all six squared numbers are summed and compared against the
third probability scoring table below.

And example will help clarify. Suppose the following result happened (in Table 3):

> TABLE 3. This is one possible set of roles that might be experienced in the experiment. Note that the number of times the spots show adds up to 36, as it should, so double check each experiment to make sure this is always true. If not, the data should be thrown out and the experiment should start again.

Sample Roll

1 spot	2 spot	3 spot	4 spot	5 spot	6 spot
5	6	8	5	7	5

The next step is to write down how far each of these numbers is from 6, like this (in Table 4):

> TABLE 4. In this example there were 5 one spots, and 5 is 1 away from 6. There were 6 two spots, and this is 0 away from 6 and so on. Those who are mathematically inclined will recognize that we are calculating, for each spot, the absolute value of the number of rolls from six, represented as $|rolls - 6|$.

Distance from 6

1 spot	2 spot	3 spot	4 spot	5 spot	6 spot
1	0	2	1	1	1

Now square (multiply each number by itself: so $1 \times 1 = 1$, $2 \times 2 = 4$, and so on) these numbers to get (in Table 5):

Add these six numbers to get 8 and compare this number with the Psychokinesis Dice Scoring Table #3 below. As can be seen, a result like this is not too surprising.

WHAT CAN GO WRONG

Be sure that the right test in is mind when scoring! For example, what cannot be done is to decide to try to force high numbers

TABLE 5. Each number from the previous table is multiplied against itself and noted. Most numbers are 1 so no work is needed. The only change is for the Three Spot, which gives $2 \times 2 = 4$.

Squared Distance from 6

1 spot	2 spot	3 spot	4 spot	5 spot	6 spot
1	0	4	1	1	1

TABLE 6. Psychokinesis Dice Scoring Table #3. Not every possible number of X, the sum of the squared differences between the number of each spot and 6, has been given. An X that is in between those given can be approximated by extrapolating between the values on either side. For example, $X = 12$ has about $p \approx 0.005$ and is not too far wrong from its true value. Even so, enough values of X are included to make a pretty good judgment of scores that are likely to arise. Once again, for those mathematically inclined readers, X has what is known as a χ^2 distribution with 5 degrees of freedom. This information can be used to look up more values of X in any standard statistical reference.

Probability of X Being Equal or Larger than n

n	1	4	7	10	13	16	19	22
p	0.9600	0.5500	0.2200	0.0750	0.0230	0.0068	0.0019	0.0005

and then score for forcing a particular spot after the test. Let's say the subject decided to force high numbers but found that data showed 15 low numbers (which has a somewhat surprising probability of 0.021). A success! No! Only 5 high numbers were noted, which is a dismal failure according to the original goal of the test. An experiment, or its goals, cannot be changed after the fact. If

the goals of the experiment are changed afterwards the probability score must be modified to reflect the possibility of multiple end points (multiple ways of claiming a success). In this example the definition of a success was changed to getting 15 high *OR* 15 low, *not just* 15 low. The actual probability of getting 15 high OR 15 low is 0.38, which is not surprising at all.

The chief thing that can go wrong is that a bad die is used. This is the randomization problem again. The effects of a bad die can be minimized by using only high quality dice and a flat surface to throw against. Use Las Vegas craps tables as a guide. Casinos insist the craps table be smooth and that the dice must hit the far wall. This increases the chances of a fair throw. If a wall cannot be found, a cup to shake the die in should be used to insure decent randomization. Nevertheless, even if some experiment to force a spot showed 14 hits (which has a 1 in 1000 chance) I myself would not be initially convinced that pk was involved because I would worry about the randomization.

Adequate randomization also worries many parapsychologists who have abandoned dice and moved on to the computer. There are many computer algorithms that are available to generate what are known as *pseudo-random* numbers. There is a branch of mathematics that is concerned with the operations of these algorithms, striving to make their output as random[1] as possible. To understand even the basics of this subject would deviate too far from the purpose of this book (although it is fascinating stuff). But here is one crucial observation: algorithmic random number generators are *deterministic.* This means, given a *seed* (a number to start the generation) they push out *the exact same pseudo-random sequence of numbers each time.* No change. Same seed, same numbers. Every time. Without exception.

Okay, fine, but what does it mean to the parapsychologist using the computer for random number generation? Everything! If the sequence of numbers is deterministic (and it is) it means *it cannot be influenced by psychokinetic powers!* This is because the sequence is mathematically determined—it is not truly random

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[1]Recall that *random* only means *unpredictable.* So the computer-generated "random" numbers may appear unpredictable to you, but they are *not* unpredictable to the guy who wrote the computer software that printed the numbers.

(unpredictable). It is only a simulation of what an actual random sequence of numbers would look like. Once a mathematician writes an algorithm to generate pseudo-random numbers it is as if he has written a road map. We start on a certain road and it only leads to one place. We cannot see the destination from the start, but we know it exists. It should be no surprise to us that, if we stay on the road, we end up at our destination. It would not be in any way miraculous. So it is with computerized tests of psychokinesis. Any positive result can only be ascribed to bad programming of the random number algorithm and not to psychokinesis. Let me be perfectly clear, a test of psychokinesis using standard computer random number generators is utterly meaningless.

If there are any readers or researchers who are not convinced, I suggest the following experiment. Save each seed and sequence of random numbers from each experiment. If one of these experiments is claimed to be significant, examine the sequence of random numbers. Then rerun the computer with the same seed, this time not using the psychic powers to influence the RNG, and also saving the resulting sequence. Compare this sequence to the one that was labeled significant. It will, of course, be found that they are identical. It cannot be claimed that somehow the psychic "forever altered" the random nature of the algorithm so that a particular sequence is seen with the given seed because the company that supplies the generator can be asked for the exact mathematical algorithm that is used to create the numbers. After examining this it will be found that the resulting "significant" sequence was predetermined, each and every number known in advance. Again, tests with pseudo-random number generators are worthless.

I want to be perfectly clear about this. Suppose the computer can only generate the numbers 0 and 1 equally often, and that the psychic sought to influence the expected number of 1's to be greater than half. The random number generator of the computer starts with the seed s, the software is fun and the psychic begins to concentrate. The following sequence is observed:

```
0   1   1   1   1   0   0   1   1   1   1
```

It *looks* like the psychic did a good job of forcing the sequence to be mostly 1's. Ok. So now dismiss the psychic and restart the

random number generator again with the seed s. You will see this sequence of numbers:

```
0   1   1   1   1   0   0   1   1   1   1
```

It's just the same! In fact, we can look at the math and software that created these numbers and *prove* that, with s as the seed, this is *the only possible sequence of 1's and 0's.* So absolutely no psychic powers could influence it in the least.

There are physical sources of randomness (unpredictability) that can be exploited to produce true sequences of random numbers. These sources are easily hooked to a computer. The computer thus replaces the deterministic algorithm with the physical system as a RNG. The decay of radioactive material is one example. The key is that the source is a physical system, something the mind can actually, if pk is a valid effect, interact with. It is not known how the mind can look into an atom of uranium and influence its decay, for example, but if it could it would be a perfect test of psychokinesis. This is because physics tells us exactly how many atoms should decay in a fixed period of time (under constant and known environmental conditions). Any large deviation from this standard could be the result of psychokinesis. At any rate, some parapsychologists have understood this and have used physical randomization devices (more sophisticated than dice). There has not yet been a consistent successful demonstration of pk using these newer methods.

2. Test Number Two: The Cotton Ball Test

Despite what you may have heard to the contrary, it's quite possible that size *does* matter. This test is very simple and has no need of statistics to interpret the results. Basically, it tests a subject's ability to move objects with their mind in the simplest way possible. Since size may matter an object that is very light but large enough to be seen is used.

WHAT YOU WILL NEED

- A cotton ball.
- A length of thread of about 2 feet.
- Glass bowl or cake plate cover (optional).
- Your notebook.

WHAT YOU WILL DO

(1) Set the cotton ball on a smooth surface inside a circle made by the thread.
(2) Attempt to move the ball outside the thread by psychokinesis. If it does, than no further proof is necessary.

WHAT CAN GO WRONG

If this test works, it is a very firm and positive demonstration of psychokinesis. If not, it can mean one of several things: 1) the subject's mind is not adept at moving cotton balls (different light objects might be tried), 2) the subject is not practiced enough, or 3) psychokinesis does not exist, or at least does not exist in the subject being tested.

The test is not foolproof, however, as several "invisible forces" unrelated to mind power can influence the movement of the cotton ball. The first is the most obvious—wind. Either from a draft in the room or perhaps from the subject's breath. The subject may concentrate so hard that they don't even notice their breath moving the ball. An open window or door in the house, the dog running by, or the ignition of a nearby heater may be all it takes to create a small enough draft. Many pk practitioners, including all the fake ones, like to wave their hands around the object to be moved. This movement is inexplicably quite vigorous as if the more energy that goes into waving the hands the more energy will be emitted from the mind. You hardly need me to tell you that waving your hands around the ball will cause air currents. To guard against these effects try enclosing the cotton ball inside a large glass bowl or cake plate cover. This will stop most, but necessarily all, wind currents (the cake plate may not form an air-tight seal around the bottom of the table, for example).

To demonstrate the next non-mental confounding force, get out a pocket comb and rub it on a sweater. Now bring the comb near the cotton ball. Chances are the cotton ball will begin to move because of the differences in electric charge between it and the comb. A body may even store enough charge to do the same thing (static electricity), especially if this body wears a wool sweater. This will be hard to guard against but you might try holding the cotton ball in your hand for a minute or two as you

sit at the testing table. This will tend to bring about a near equi-
librium between the charges in your body and that of the cotton
ball. It's not a guarantee though. Also, the charge difference may
continue to grow once you set the ball down. To check this, before
you begin mentally concentrating to try and move the ball wave
your arms near the ball and see if it moves. Telltale strands of
cotton on the ball will straighten toward your or away from your
arm if there is a charge.

3. FINAL WORD

To this date, no positive demonstrations of pk have been ver-
ifiably observed, or at least none replicated. As mentioned, many
historical early computerized pk tests attempted to influence a
random number generator, a practice which has been shown to
be fraught with fundamental errors. Public instances of macro-
pk have certainly been reported. These are from the "psychics"
who can bend cutlery with their mind. Why evolution would have
equipped mankind with this strange ability is anyone's guess. But
ask yourself this: isn't it strange that these spoon benders can
only perform their miracles under non-test conditions and only
on dinnerware? If they have the ability to bend spoons by heating
the molecules within, why can't they cause the mercury in a ther-
mometer to rise? Or cause pieces of aluminum foil to move (with-
out being touched)? Why can't the energy that does this heating
be measured? If a mental energy, no matter how mysterious, is to
affect a real physical system, such as the molecules of a spoon, it
will have to produce an energy that interacts with these molecules
in known and measurable ways. This energy can be measured, but
attempts to do so have been severely lacking. There is no short-
age of psychics performing pk effects, but this anecdotal evidence
is ultimately unsatisfactory. Particularly damning is that spoon
bending, the main claim to fame of pk, has long been known to
magicians as a simple sleight-of-hand trick. This may explain why
spoon benders cannot seem to bend the spoons with their "mind"
when a magician is present.

Again, the idea of psychically influencing deterministic pseudo-
random number generators has been shown to have no basis. But
the claim that individuals can subtly influence the outcome of

true random number generators is also strange. The dice test, as
represented here, has been used in professional parapsychology
experiments. What is claimed is that a person cannot summon
enough mental strength to be able to actually move a die that lies
motionless. They are only able to exert a gentle force that tips it
one direction or another so that a certain spot on the die shows up
more than chance would allow. But how? How does the person's
mind connect with the die as it chaotically bounces around the
floor to give it this little push? It's traveling too fast for the eye
to see and it stops moving too quickly to focus on, so it is hard
to argue how the mind is consciously causing the movement in a
desired direction. How can the six spot be forced when the die is
moving too fast to be seen? And, if the mind can actually cause
enough physical energy to cause the die's movement, why can't it
then push a cotton ball or a similar light object?

Parapsychologists are well aware that so-called macro-pk has
not been observed and have instead focused their efforts on what
is know as "micro-pk," the ability of the mind to move very small
or even infinitesimally small objects. As mentioned, standard ex-
periments involve subjects attempting to influence the output of
a random number generator on a computer. These experiments
unfold something like this: a blob is programmed to move along a
line on the computer screen in random increments. The subject is
asked to concentrate and to force the blob, say, left or right. If the
blob stays more to the left or right than chance would predict then
this is evidence of pk[2]. The problem with many of these experi-
ments is that they are designed with a complete misunderstanding
of how computers work. As mentioned, random numbers spit out
by a computer are not random at all, but pseudo-random, which
actually means they are deterministic sequences of numbers. That
is, we know, in advance, just exactly what the sequence of num-
bers will be.

Psychokinesis, if proved real, should be a reproducible event
and one that can actually be physically measured. Relying on
statistics is a big mistake. A physical-biological mechanism must

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[2]This is high-tech version of the dice test in which more high (or low)
numbers are forced

be proposed, studied, and verified. Glib and ill-informed explanations invoking quantum mechanics are not a substitute for a real definable theory with practical applications.

CHAPTER 7

Auras

> **aura:** A colorful field of energy that envelops the body, or emanates from it, projecting several inches beyond a person's skin. The color of this field is said to vary with the quality and internal emotional or psychic state of the person.

The idea of auras most likely was derived from the ancient idea that exceptionally spiritual or pious people were bathed in the holy light of some deity. This light was visible (to those who could discern such things) and emanated from the head of those divine beings who warranted the special attention of God. Familiar examples of this are found in Christian paintings of the saints, who have halos of divine light encircling their heads. This idea probably evolved through time to become the aura.

Auras are said to be composed of many colors, possibly changing in time due to different emotional and psychical states of the person, and emanating from other areas besides the head. Many interpretations exist as to what the colors mean, although these explanations do not really concern us here—a plethora of books have been written on the subject and can be read by the curious. Many of these investigations offer conflicting accounts, and it seems as if many authors create their theories as they write. As an interesting side test it might be fun to consult several sources, well mixed between current and old, and see how many different, and perhaps contradictory, interpretations there are for each different color. Perhaps a table can be constructed which lists the different meanings of "green." I leave this as an exercise for the curious reader[1].

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[1]But if someone does do it, please send me a copy. I'd love to see it.

Some people claim that they can actually photograph auras: this is the idea of *Kirlian* and other spiritual photography. These are usually ordinary photographs that pick up changes in the electrical state, humidity, and temperature of the body being photographed. Physics can easily explain why these photos look the way they do, but some people are tempted into ascribing the results to the power of auras. Maybe so, but we can test.

1. Test Number One: The Screen Test

The idea for this test is quite simple. If an aura exists and projects several inches beyond the body, a psychic person should be able to see it even though the body is concealed. Since the aura doesn't "stick out" too far care must be taken not to conceal the body too much. A person standing behind a door or opaque screen just taller than he is should do the trick. Get one of more friends to stand behind a door and then try to discern whether their aura is present or not. A coin toss will be used to decide whether your friend will stand behind the door or whether he stands off to one side. Your job is to discover when he is standing behind the door by nothing the presence or absence of his aura. Test set up is important here. Before the test make sure the subject (whoever is doing the guessing) can see the aura of the people behind the door when she knows they are there. Use only those people whose auras that can be seen unambiguously, whose auras are strong enough to readily identify every time.

WHAT YOU WILL NEED

- At least two friends, one of whom is the subject (who has a strong aura) and the other is the judge.
- A tall screen or doorway large enough to conceal a standing person.
- A coin.
- Your notebook.
- Watch (optional).

WHAT YOU WILL DO

(1) The judge flips a coin. If Heads the subject stands behind the door. If Tails he does not.

(2) Some indication of when each trial begins and ends is needed. The judge announces when the trial begins and

ends. Allow about 10 seconds in trying to guess whether someone is behind the door or not. Two people can do the test but they have to agree on the timing of the test period beforehand.

(3) The judge notes down, for each trial, whether someone was behind the door and what the subject's guess was. There should be 20 trials.

TABLE 1. Aura scoring table. Only guesses from 10 on up are given. The interpretation of this table should be familiar by now. For example, it is expected that 17 or more hits would be seen by chance one out of every 1000 experiments .

Probability of at least n Correct Matches

n	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
p	0.590	0.410	0.250	0.130	0.058	0.021	0.006	0.001

WHAT CAN GO WRONG

Sensory leakage is the biggest problem here. For example, it must be made absolutely certain that the person behind the screen or door cannot be seen. Watch for feet poking out at the bottom of the door. Subtle changes in the lighting can occur when someone is behind the screen and when they are not. Try using bright lights and a lamp pointing at the door on the guessers side. Since this light may interfere with the aura be sure that they aura can still be seen in the light. Total darkness may be tried if the light causes interference.

Be sure that the person standing behind the door cannot be heard either. If he accidentally taps the door with his foot or brushes up against it with his clothing the guesser might be able to hear it and "sense" someone is there. Likewise for heavy breathers. To reduce the possibility of inadvertently hearing them the guesser should wear headphones and play some soft music. Again, be sure that the music doesn't interfere with your ability to see the aura.

The judge may also slip up and accidentally indicate that someone is behind the door or not. Make several test runs and concentrate only on the judge and see if the guesser can sense any

change in the judge's demeanor from when someone is and isn't behind the door.

After the fact feedback doesn't hurt here as each trial is independent of one another. That is, it does no harm to learn whether or not the last guess was correct or not. But doing so might still lead the guesser to identify, from the movements of the judge, when someone is behind the door and when they are not. Be cautious, therefore, and try to avoid feedback.

2. FINAL WORD

This test for auras has been done professionally many times before with no success to date. The magician James Randi once did a screen test similar to the one above on live television with a woman who claimed to always be able to see auras, but she failed to perform under test conditions. All other documented rigid tests to date show the same result.

The aura experiment is similar to one the then 9-year old Emily Rosa recently created to test Theraputic Touch (TT) in 1996. TT is advocated by some nurses as a healing therapy. TT practitioners claim to be able to move "energies" through the body by waving their hands above a patient (they do not actually touch the patient). The TT practitioner's body interacts with the patient's energy causing this energy to flow. These so-called energies, once redistributed, are said to increase the pace of the body's natural healing process. TT advocates also claim that they can feel the energy field of someone using just their hands. The energy field, like the aura, is supposed to protrude several inches above someone's skin. So, in theory, testing for someone's ability to feel this energy should be simple.

Miss Rosa's test was simple too. TT nurses sat behind a cardboard screen through which they could place their hands, palm up. A coin was flipped and, depending on whether it was heads or tails, Miss Rosa placed her left or right hand over the right or left hand of the nurse. All the TT nurse had to do was to identify the hand which felt the energy. If the energy was truly there, the TT nurse should have no difficulty in detecting it.

A number of trials were conducted with the result that the number of hits was no better than chance. To many people this is

strong evidence that TT doesn't work, that the energy fields just aren't there. But, you won't be surprised to learn, the TT people did not believe this. All of a sudden, after the fact, after they had agreed to the guidelines of the test, after they assured themselves they could feel Miss Rosa's energy field (when they could see her, of course), they started complaining about the protocols: Miss Rosa was said to be too young, or too old, or too hot or too cold, or too nervous or too calm, or too whatever. None of these things was a problem *before* the test began: everyone was able to sense her field when they saw (with their eyes) Miss Rosa sitting there. But they couldn't adequately identify her energy field when they didn't know she was there. This is powerful evidence against the validity of TT. For her impressive research Miss Rosa was even chosen to deliver the keynote address of the 1998 Ig Nobel awards[2].

The interesting thing about both the Aura and TT test is that they should not be statistical tests at all. If a person can see an aura or feel another person's energy field then we would expect that they can see or feel the necessary "vibrations" all the time, or at least be able to tell us *beforehand* when they cannot. A strict test of abilities would require the psychic or nurse to get it right every single time. Statistical tests, even if they are significant with a very low probability of success, will never be entirely convincing because there is always the chance, however small (recall the Law of Truly Large Numbers) that a positive result is a fluke.

Miss Rosa's TT test should be powerful evidence against the validity of TT, but it's not viewed that way. The response has been mainly that of anger from those who believe in TT. Not anger with themselves, as might be expected because they failed the test so dismally, but anger directed at Miss Rosa and those who use this test to show that the basic precepts of TT cannot be proven!

This controversy also illustrates another general finding in the parapsychological community. That, for some people, no amount of negative findings, no number of failed tests, can ever convince them a certain ability does not exist. Their faith is unshaken by

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[2]The Ig Nobels sort of parallel the real Nobels but are for research that cannot and should not be reproduced.

evidence. What usually happens is that some grand claim is made, or some extraordinary, even by psi standards, ability is posited. For example, the fantastic ability to lift a car with the powers of one's mind. Tests are done. Most fail. A few do not and there is initial excitement over the successes. But as time passes flaws in the original experiment are discovered, or alternative non-paranormal explanations are found for the positive results. No one can duplicate the results.

The believers cannot be dissuaded. So they modify the claim. "It's not cars that can be moved," they say, "but bricks." The experimental cycle is repeated with the same results. Perhaps a few people give up on the claim but the truly faithful continue to believe and modify once more. "No, not bricks. Spoons!" Then pins, then only dice while in flight, and finally the truly small atoms and quarks (this may remind you of the test for psychokinesis.)

When the final tests fail, the devoted still will not give up, and will modify the hypotheses still more. "Yes, atoms can be moved, but only when the person has positive energy flow." When positive energy flow fails, negative will be tried. It will turn out that it was positive all along, but only when properly aligned with the earth's magnetic field. No, not the magnetic field, it will be discovered, but the the known astral planes are firmly aligned.

And so on.

To the outsider it looks like desperation. To the believer it looks like research.

As I've stated before, there has to come a time when a reasonable person is convinced nothing mysterious is happening, that a certain power does not exist. It may be "spiritually correct" to maintain the faith, but faith doesn't prove anything. You cannot ultimately gain anything by stubbornly believing in a hypothesis for which there is no evidence; or, rather, for which there is a weath of *negative* evidence.

This controversy nicely highlights the fact that all expectations of the experiment must be determined before the experimental design is settled. It is not productive to start complaining after the fact. If you think your subject is too young or too old or too hot or too cold, decide on this *before* the test begins. If you don't get positive results you must not be allowed to have any

excuse as to why the test went wrong, other than the fact that you did not manifest the powers you hoped to demonstrate.

CHAPTER 8

Astrology

astrology: The belief that the exact positions and distribution of extraterrestrial material, such as stars and planets, at the moment of an individual's birth influences their destiny, and, at least partially, determines their character. A reading of a person's birth information encoded in the stars is known as a *horoscope.*

There are several versions and methodologies of astrology such as sun-sign, Babylonian, Celtic, and Chinese animal-sign. All share the belief that the spatial distribution of extraterrestrial material profoundly influences individual human destiny. The "extraterrestrial material" relied on for guidance is usually comprised of only a few visible stars and our solar system's planets. Any astronomer will tell you there is much more in space than the handful of stars and planets that astrologists most often use. For example, the latest findings in astrophysics, a field that combines all that is known about quantum mechanics and relativity, indicates that a large percentage of the universe is composed of what is known as "dark matter." Not much is known about dark matter—it may be composed of common bits of matter such as the tiny neutrino, or it may be a conglomeration of new and exotic particles still waiting to be discovered. What is known is that there is a lot of it and that its existence profoundly drives the dynamics of the universe. Because the existence of dark matter has only recently been discovered, few astrological systems takes it into account. Strangely, the vast majority of known extraterrestrial matter is also completely ignored in astrological systems. This is a consequence of the fact that these astrological systems were developed before the advent of modern astronomy.

What's most curious is that recent astronomical findings, such as the discovery of new moons around Saturn, or new planets at

the edge of our solar system, do not force a change in the workings and mechanisms that are used to generate horoscopes. It's curious because one would think that any system that is based on knowing the positions and distribution of extraterrestrial matter would have to change when the very basis of that system—the distribution of extraterrestrial matter—has been found to be in error or is incomplete.

Astrology generally requires a subject matter expert called an *astrologer* to take a reading of the position of a limited set of stars and planets that existed at the time of a person's birth (this distribution, of course, changes with time). This reading is known as a *horoscope*. Most horoscopes claim to be able to describe, in great detail, the personality of someone and to forsee that person's future. Studies have demonstrated that almost any horoscope can be interpreted so broadly that it's valid for anyone. This is the case because horoscopes often contain phrases like, "You like to spend money, but are afraid of going broke." Can you identify a person for whom this statement does not hold true?

The tests below do not differentiate between any particular system or methodology of astrology. This is not necessary because regardless of the branch of astrology that is believed to hold, its precepts and predictions may be tested. Can they all be right? Or is only one system the *true* astronomy? How can we find out? Read on!

1. Test Number One: Newspaper And Magazine Astrology

Most prominent astrologers scoff at the idea that newspaper astrology columns contain useful information. They might agree that perhaps a few helpful tidbits can be found in the latest *Vogue* star signs column for example, but for the most part these columns are for show. They do generate interest in the subject, but true informational readings can only be done by a competent astrologer using complete birth information. However, many people are not dissuaded from reading and following these popular newspaper and magazine columns. This is a simple test that we can perform to ascertain whether newspaper and magazine astrology columns are valid or not.

At the end of each day you will assemble a pile of that day's twelve star sign readings and gauge which one was most accurate. If you choose the one which matches your birth sign then the reading is said to be accurate (a hit).

WHAT YOU WILL NEED

- A very patient friend. This is essential as your friend will be the one who assembles the columns.
- 5 daily newspaper columns (they need not be consecutive days).
- Your notebook.

WHAT YOU WILL DO

(1) Your friend will, each day you decide to do the test, clip out the astrology column and remove all star sign indications from each horoscope. Most of the readings in these columns have headings such as **Aries** and **Libra** that need to be removed so that you have no indication which birth sign you are reading.

(2) Each horoscope must be separated from the others. At the end of each day your friend will have a pile of 12 clippings.

(3) Your friend also needs to read through each one and remove any indication of the birth sign from the text. This is tedious work, but without being careful you cannot be sure you didn't choose the right column because you happened to notice you were reading the "right one," the one that matched your birth sign. As an alternative, your friend can re-type the information, removing the give-away words.

(4) Your friend must keep track of which clipping is which. The easiest way to do this is to keep an extra copy of the paper on hand to compare the writing. The slips can also be randomly numbered (do *not* order them the same as the birth months! Use a deck of twelve cards to help you do this. Do *not* use the same numbers from day to day.). The numbers should be recorded in your notebook.

(5) At the end of each day, or even the next morning, you will read each of the 12 clippings and decided which most closely represented that day. Your friend writes

your choice in the notebook and whether it matches your actual star sign.

(6) At the end of five days count the number of correct matches and consult the Astrology Scoring table.

TABLE 1. Astrology scoring table. As you can see, you really must get at least three matches for there to be any real evidence that the clippings are accurate – this would only happen by chance about 5 times out of 1000 experiments.

Probability of at least n Matches

n	**0**	**1**	**2**	**3**	**4**	**5**
p	1.000	0.3500	0.0600	0.00500	0.00020	0.000004

WHAT COULD GO WRONG

It sometimes is the case that horoscopes read like a story from one day to the next. One day's column may refer to a column from the previous day, for instance. This is dangerous because it might lead you to select the same birth sign reading two or more days in a row. Why? Because if you remembered details from the day before you would think it was only natural that you should select the "same one" as before. This is great for your score if it happens to be the right one, but devastating if it is not. Therefore, it is best if the five columns are spread out, maybe skipping every other day. This will certainly make the test more work, but remember we are not after easy tests, but correct results.

You also want to make sure that your friend gives no indication about the correctness of your guess. This being the case you should have him secretly keep track of the correct star sign with every reading. When you go to make your choice your friend should not be with you to avoid the possibility of unconsciously influencing you. You should make it a habit to randomly mix the order of the clippings when given to you. After you have made your guess return the clippings to your friend, perhaps in an envelope so it is hidden, and then have him score it as correct or not. Your friend should never ever tell you how well you have done until the five tests are over.

And of course, there is always the possibilty that you did not remove all the "telling words." Suppose you are an aires, for example, and instead of the word "aries", the horoscope may have something about "locking your horns" to attack some personal problem. Aries is the sign of the ram, and rams come equipped with horns. This would be too big of a clue for you to pass up. So have your friend be careful with the edits!

2. Test Number Two: Many Friends

The previous test followed your readings for a number of days, and therefore you won't get the results very quickly. This test uses a group of your friends and you can do it all on one sitting, perhaps at a party, so that you can see right away whether the newspaper horoscopes are valid.

WHAT YOU WILL NEED

- One set of 12 daily or monthly horoscopes clipped out of a magazine or newspaper.
- Three to sixteen friends, all gathered at the same time.
- Your notebook.

WHAT YOU WILL DO

(1) As before, remove all identifying remarks from the written horoscopes so that no one can tell which one is which.
(2) Mark each horoscope with a randomly chosen number or other identifying remark so that you can remember which one was which later. Record these numbers in your notebook.
(3) Each of your friends, independently of all the others, reads the horoscopes and picks the one she thinks best fits her. Have her write down the number or mark of this horoscope in a table in your notebook. By the side of this number write down your friend's actual sign. Be sure to keep the results hidden from your friends as the test progresses. Do not allow your friends to discuss the test as it is going on.
(4) Keep track of the number of hits and use the Variable Number of Friends scoring table below to find out how well they did.

Table 2. Variable Number of Friends scoring table. This table is different than most others because there is not a probability for a number of hits. Instead the probability is fixed, here at $p = 0.01$ or less. Look to the left column and match up how many friends participated in the test. Then look to the row across from this number to the column on the right. This is the minimum number of hits you need so that that probability of seeing this minimum numbers of hits or greater is less than or equal to 0.01.

Number of Hits Needed

Number Of Friends	Number of Hits
3-6	2
7-11	3
12-16	4

Let's say you had 5 friends and only 1 hit. That means, by chance alone, you could have got that result with a probability greater than 0.01 (it's actually about 0.06, or 6%). The level of 0.01 is arbitrary, and is one that I personally feel is "surprising;" you may have a different number. The table would be very cumbersome if I wanted to show all the probabilities per hit by the number of people you had in the experiment. Think of 0.01 is a rough guideline.

WHAT COULD GO WRONG

If one or more of your friends are big fans of horoscopes there is a chance they have seen the horoscope before and therefore already know which one is meant for them. They might not tell you this, wanting to be "part of the fun," so be sure to encourage people to admit whether or not they have seen the horoscopes already. As before, it may be difficult to remove identifying information. You may have even think you've gotten all of it, but find out after the test, perhaps through discussing the results, that you've missed something. And yes, this invalidates all the results and you have to start again.

Also be sure that you don't give any hints (feedback). Don't read the horoscopes over your friend's shoulders. You should conceal each friend's answer from the others. This is because previous guesses may influence the current guess. Your friend may notice that someone said "horoscope 12" matched him best and that he was a Libra. The second friend is a "Gemini" and may be disinclined to choose horoscope 12 even though it may be the right one. Your body language may give away the correct, or even incorrect, readings. Be careful.

3. Test Number Tree: Professional Readings

As some professional astrologers scoff at newspaper horoscopes we must have a test that can be used with specially and expertly prepared horoscopes. Typically, these professionals will produce such a reading for a fee. Be sure to ask for one that adequately and thoroughly describes your personality and personal characteristics. We will use this reading in a sort of "negative" test. This will be a difficult test to do mostly because it is very time consuming. But this is a very good test if done correctly—although it will never be as convincing as other tests in this book simply because it is "negative" (to see what this means, keep reading!).

WHAT YOU WILL NEED

- A professional astrological reading in writing, especially prepared for *you*.
- At least 5 friends who do *not* share the same birth sign as you. It is very important that they are not the same sign.

WHAT YOU WILL DO

(1) Get a professional reading. This may cost anywhere from 5 to 500 dollars, or even more. "Professional" is up to you to decide, but it should be prepared by someone who has a lot of experience and is willing to write it all down. Many readings are available on the internet.

(2) Once you have it, read it over and rate how well the reading describes you on a scale of 1 to 100, with 100 being a perfect match.

(3) Before doing anything else, decide on how low a rating you would have personally accepted, below which means

that the reading does not adequately describe your personality at all. For example, say you decide this number is 65. If you rated the test 65 or above than you are saying that, in general, this reading really does describe your own personal characteristics. Note this number.

(4) Now remove all indications that the reading was done for you. This is best done by having the reading re-typed and removing every instance of your name and of the mention of your birth sign information. Yes, this tedious! But it *must* be done. Substitute every instance of your name with the word "you" and every instance of your birth sign information with "your sign" or "your house" etc.

(5) Bring the retyped reading to each of at least five friends and tell them you had the reading done especially for *them*. Have them read it.

(6) When they are finished have them rate it as you did. Keep track of these ratings—particularly keep track of the number of people who gave the reading your minimal acceptable score or higher.

Since the reading was done especially for you, using your own very specific birth information, the probability that it matches someone else exactly should be near zero (although this is, admittedly, a subjective probability). Of course, we would expect that some of the specifics in the reading would apply to other people *but not the entire thing.* I might expect, say, one other person out of five to rate my horoscope highly, but I would not expect two or three or more. If three or more do rate it highly, it means that the reading is not accurate. Think about this: if you rated it as accurate how could anyone else? After all, the horoscope was provided for *you* using the alignment of planets in force at *your* birth, not someone else's. It means that your birth information was not very useful because it didn't allow the astrologer to pick out anything specific to you.

WHAT COULD GO WRONG

You must make certain that the friends you approach are receptive to astrology and its precepts. Any skeptic you approach will automatically rate the professional horoscope low. You want

someone to honestly assess what they have read and give a considered opinion on how well the readings matches their personality. But there is danger here too. Someone who is enormously enthusiastic about astrology may be tempted to rate any reading as highly accurate (but this should tell you something!). After all, from their perspective, you have gone to the trouble and expense of preparing a horoscope for *them*. So they are primed to think it is genuine.

It is *crucial* for your friends to think the reading was prepared for them. If they knew it was really for you, it is highly improbable that they would ever rate it as matching themselves. You must also insure that you get a response from them. You must impress upon them how important it is to you that they rate the reading in a dispatched and timely manner. If you don't get a response the test would be ruined.

4. FINAL WORD

Tests like number three have been done before, but by using generic horoscopes handed out to people randomly. In these experiments most people rated the generic horoscopes as being highly accurate. In one version of this experiment a class of college students was each handed the same horoscope. They were told that they were each receiving a reading prepared especially for them. Every student, after reading the horoscope, rated it as highly accurate with respect to how well it described their own personality. Every one! This dramatically showed that people love to believe astrology. Each student tried hard to find *positive* evidence to support the idea that the horoscope was theirs. None of the students tried to find evidence *against* the idea that the horoscope was theirs. In this case the students read bland statements like, "You like people" and used this as evidence to support their belief that the horoscope as accurate.

This is why astrology is so common. In ancient times, astrology was used mainly for prediction and prophecy. Today it serves as an inexpensive and accessible counseling service. Nearly all readings contain the idea that you, despite all your failures, setbacks, and problems, are basically a good honest person bound for

some eventual success[1]. No one wants to dispute that promising premise—that everything will work out in the end, so it is easy to invest your emotions in meaningless astrological readings.

But there has never been a successful test of astrology, done under controlled conditions such as I've outlined here.

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[1]Which must be true, since you bought this book!

CHAPTER 9

Dowsing

> **dowsing:** The process of finding a hidden objects with a specialized rod or stick. Sometimes a crystal held on a string is used. Also known as water-witching (as water is the most popular object searched for).

Here's the scene: an old man walks through the prickly woods with a forked stick. He holds twos ends of the forked stick. The tines of the branch meet and form a long and slender branch which suddenly and dramatically points towards the ground. The old man says, "It's here. Put the well here. Down about thirty-five feet." On this command a truck moves to the spot and a drill bores into the earth.

An hour later water spurts up through the drill tube. The workman charges by the foot to dig the well . He says, "Eighteen feet. Easy going too. Good flow."

Water was found in the exact spot designated by our old man. He located the water using a *dowsing rod*, which is the fancy name for the forked stick. He could have equally well used a pendulum on a string. Many dowsers do. There are various theories on how dowsing rods work, all depending on some mysterious "vibrational" properties of the object being sought. These vibrations, or mysterious emanations, seep up from the ground, make their way to the dowsing rod, and cause it to twitch downward in a sensitive user's hands. A typical water dowser will walk over a large patch of ground and estimate where the twitches are strongest.

What about the example of the old man? Was his attempt a success? Should we use this example to bolster our belief in dowsing? Probably not, and here's why. He got the location about right, but not the depth. Well, you may argue, this is a quibble, getting the spot right is all that counts. Maybe so, but ask yourself this: would he have been just as right if he said the spot to

drill was perhaps ten feet to the left? Probably. This is because underground water is not a point-like thing, it exists as everything from small ponds, to raging rivers, to vast subterranean lakes. In fact, underground water is so ubiquitous in the United States, that if you drilled just about anywhere you'd eventually be rewarded with a well. Pause on the thought and re-read this fact again: *if you drilled just about anywhere you'd hit water*. So how can we say our old man got it right? Honestly, we can't. There was no way for him to fail.

What is needed is a more rigorous test, one that allows the possibility of failure. There have been several major organized and comprehensive attempts to investigate the validity of dowsing using such tests. There have been some complicated and intricate tests and some simple ones, all done under strict control, under the watchful eyes of judges and experts to verify the test was perfectly fair and well run. In the back of the book you'll find some references on some of these tests. Following is a simple, but professional, test.

1. Testing For Dowsing

What you cannot do is to go outside with a bent twig and walk around until it points downward to indicate water, dig, hit water, and conclude you have demonstrated the validity of dowsing, because, as discussed above, water is everywhere. If the probability of success is nearly one, how surprising is it that someone succeeds? Not very. Luckily, it is actually quite easy to develop a simple and adequate test that can be done at home. This is such a test.

WHAT YOU WILL NEED

- A dowsing rod, dowsing stick, crystal on necklace, or other similar object with which to dowse.
- Six glasses, one of which is half-filled with water. Or, one other object that you feel sure emits the necessary signals that would allow you to dowse for it.
- Six opaque bags large enough to cover the glasses or objects. They should also be able to stand on their own so that there can be no external indication as to whether there is anything inside them or not.

- One die.
- One friend.
- Six 3×5 cards numbered from 1 to 6.
- A room or table in which you feel comfortable working.
- Your notebook.

WHAT YOU WILL DO

(1) Spread the 3×5 cards evenly spaced on the floor or table at which you will be working.

(2) After you leave the room, your friend rolls the die once. The glass with water (or other object) is placed by the 3×5 card that matches the die. He writes this number in the notebook, along side the number of the trial.

(3) All six spots are then covered with the paper bags ensuring that the water glass or object cannot be seen under any of them.

(4) You then come back into the room and your friend leaves.

(5) Starting at place number one, and working your way to place six, you attempt to discern which bag contains the water or other object. You note this number on a slip of paper along side the trial number.

(6) Your friend comes back in and you leave *without communicating to each other.*

(7) This is repeated 20 times after which you transfer your guesses from the slip of paper to your notebook. Tally the correct impressions and the scoring is done with the Dowsing scoring table below.

WHAT COULD GO WRONG

The main thing that could go wrong is that the bags do not do an adequate job of hiding the object. Maybe there is bulge, or perhaps there is a little spilled water or condensation under the proper bag. If you use the same bag for the object/water glass each time, it may become soiled or worn, thus giving subtle clues that something is under it. Perhaps your friend scuffed or otherwise accidentally marked the table where he placed the object. It is also important that your friend not be in the room while you are dowsing. This insures there is no possibility of nonverbal feedback from him. I'm not joking when I suggest that you and he should enter and leave by different doors. Remember, you can *never be*

TABLE 1. Dowsing scoring table. The probability of getting n or more correct matching impressions from 20 tries. Only correct guesses up to 11 are indicated. There is strong evidence of dowsing ability by getting only 8 or more matches—the probability of this happening by chance is only 0.011 (this means it would happen by chance about 1 time for every 100 trials). Getting 9 or more hits happens by chance on 3 times in every 1000 trials.

Probability of at least n Correct Matches

n	4	5	6	7	8	9	10	11
p	0.4300	0.2300	0.1000	0.0400	0.0110	0.0030	0.0006	0.0001

too careful. When professionals do this test they are exceedingly careful when hiding the object at the beginning of each run: they touch each bag each time, so that all bags wear at the same rate. It also helps cover their steps, or other possible markings on the table or grass if the test is performed outside. Check and check again before you do the experiment that you cannot see anything by normal means.

It is also best if you run through a few test trials with the bags uncovered so that you can be sure you can sense the object/water. Be sure to eliminate anything that is bothersome to you in advance because you want to avoid trying to come up with excuses after the fact if things do not work out. This is also a very important step.

Randomization is, as ever, a potential problem. You must insure that the die is fairly tossed, and tossed *only once* each trial.

Before commencing the offical trial, you should be sure that you can sense the object when you know where it is, both without the paper bags covering it and again with them covering it. Be absolutely sure that you sense the object. It will then be no good to make the after-the-fact excuse that you couldn't sense water under paper bags. Do not allow yourself to make a cheap excuse like that! Experimentation is hard work; take the time to do it right.

It is not possible to do the dowsing test alone. The chance that you will unconsciously adjust and adapt your responses is just too great. This unconscious manipulation of the dowsing apparatus is called the *ideomotor* effect and it is amazingly strong. Psychologists claim that this movement can entirely account for why dowsing is accepted as a valid phenomena. You may not be aware that you are causing the positive dowsing indication. At any rate, you will never truly convince yourself unless you do the test as outlined, when the water is hidden and you cannot know it is there by ordinary means.

2. Final Word

As mentioned, there have been many well-organized tests for dowsing. Several have been televised and most were similar to the test described above. Some were done outdoors using complicated arrangements of pipes, some filled with water, others not. Other testers were very careful about placement of the water in the way we tried to be in this test. One such experiment involved a hidden glass of water under some buckets (taking the part of our paper bags), set out apart on a lawn. Each time the test was to be reset the experimenter walked to each bucket, picked it up and set it down again. All this so that the dowser would not accidentally notice footprints in the grass, or see that only one bucket has been moved. None of these controlled tests has ever yet been passed. There has never been officially recognized instances of dowsing abilities to date.

This makes me pretty skeptical about dowsing being a real phenomena. Sure, there are plenty of anecdotes about Uncle Harry and his keen insight into where water can be found, but these anecdotes never seem to be able to hold water when examined closely. It's true that the unusual conditions or possible extreme mental stress that "official" tests create might degrade true dowsing performance. But the test here is done on your own terms, in your own home, without stress. In professional tests this stress is controlled by allowing each dowser to practice and confirm his abilities before the actual test begins. For example, in the lawn experiment, the dowser is invited to walk the lawn and see under all the buckets, to confirm that he really can find the water in

the test conditions. Once he is comfortable the true experiment begins (and, so far, each time he fails).

We have to ask ourselves why. If we are honest, we must start to believe that there might not be a thing such as dowsing.

CHAPTER 10

Astral Projection

> **astral projection:** Where the spirit body, consciousness in raw form, perhaps the soul, exits the physical body and can travel large distances. As the spirit body travels it can sense and record its surroundings. Also known as an out-of-body experience or remote viewing.

Astral projection is similar to clairvoyance in that an individual, while having an out-of-body experience, can sense her remote physical surroundings other than by normal means. But, unlike clairvoyance, it is theorized that a person's actual consciousness, or spirit form, actually separates from the physical body and can exist independently from it. However, the astral body can only exist independently for short periods of time out of its host. While the astral body is roaming it can travel at will through the material world. That is, the astral body can travel through objects and is not deterred by any known physical limits, such as the the speed of light. To release the astral body the subject often relaxes as much as possible without actually falling asleep. A floating feeling is sensed as the person's astral body first leaves the real body. People experiencing this report that they are able to hover over their body—typically from a vantage point near the ceiling of the room in which their body lies. Once free of the bodily shell, the spiritual essence can roam at will and is able to sense and record its surroundings. It is this property that we will exploit in the test for the reality of astral projection.

1. Testing For The Reality Of Astral Projection

The test for astral projection is simple and definitive. As you will see, it is easy to set up and to do and very little can go wrong. This is one of the simplest tests in the book.

WHAT YOU WILL NEED

- A friend.
- A piece of paper.
- Your notebook.

WHAT YOU WILL DO

(1) Before nightfall your friend legibly, and in bold letter, writes a short item of information on a piece paper and places it on her dresser. This information could be a number, color, date, historical fact, cake recipe, etc. In fact, it should be just about anything and you should have no idea in advance what it could be.

(2) That night, project yourself to your friend's room and look at the information she has written on the paper. When you get back to your body immediately write down what you saw in your notebook.

(3) The next morning confirm with your friend your vision.

(4) Be sure to record the attempt in your notebook. Note the date and other information you feel is relevant.

The probability of correctly randomly guessing what is on the paper is essentially zero and any correct guess is strong evidence in favor of astral projection, but not necessarily overwhelming evidence because things can still go wrong.

WHAT COULD GO WRONG

Imagine that you are using the assistance of your very best friend for this test. Is it in any way possible for her to select something that you might guess she would select? The name of her cat, for example, or the name of the person in a beloved photo. If you do get it right the first time it may be because you two are so close that you know too much about each other. Encourage your friend to put something obscure on the paper. Maybe something she has just looked up in a dictionary or on the internet. Flipping to a random page in the dictionary is a great idea. Once at a page, have her close her eyes and stab at a word. Have her write down the first one she comes to, even if it's part of another word's definition. In order to be conclusive you must be able to replicate this test or else no one, not even yourself, will ever believe it actually happened. A better idea is to put down two or more words.

As always, close is *not* close enough. You must be able to exactly describe what was on the paper. Vague impressions and tremulous vibrations won't do. If you actually can astrally project yourself, you will be able to see what is on the paper. You won't see amorphous shapes or fuzzy outlines, you'll be able to see the entire paper. So if you said you saw the word "animal" and the actual word was "aardvark" this is *not* a hit. It is true an aardvark is an animal but you did not see the word aardvark, you saw the word animal and you did not get it right. For example, you might have also seen the word "ant." That's close to aardvark, isn't it? How about "mammal" or "nose" (and aardvark is a mammal with an exceptionally long nose)? Even "Africa" and "The Pink Panther" are close (the later reference, for those abysmally ignorant of American cartoon history, is from a cartoon series which featured a blue anteater, or aardvark, who was always running into difficulties with a certain ant; a sort of *Tom and Jerry* set on the veldt). As you can guess, even with an obscure word like aardvark we can think of dozens and dozens of "close" and "nearly matching" words. Remember: a hit is only a hit if you get the exact word!

Here's another example using a word that I just now randomly picked from the original Pinocchio by G. Collodi. The word is *pretended.* Now, here is a small list of words that, off the top of my head, seem close: guess, choose, imagination, clouds (think of cartoon thought balloons), afternoon (for drowsy dreaming on a grassy slope), dreaming is very close too, story, tale, etc. etc. The number of associations is enormous. As an experiment that can be a lot of fun I invite you to try this yourself. Grab a dictionary, pick a word at random, and grab a couple of people and write down as many words and phrases as you can that you all think are close. I believe you will see that once you get started it's difficult to stop!

It may be that your astral body cannot make the long journey to your friend's house. This is not a problem as the test is easily modified. Pick the tallest object in your room, one in which you can not see on top of as you stand. Have your friend place her paper on top of this object while you are out of the room. When you return, attempt to project yourself out of your body. This time you have no real distance to travel. Be careful your friend

does not show you her writing before you come into the room or otherwise signal the information.

2. FINAL WORD

To date several interesting experiments have taken place that attempt to confirm the existence of astral projection. An eloquent description of some of these experiments is related in the book *Adventures of a Parapsychologist* by Susan Blackmore. In the book she describes an unsuccessful experiment very much like the one outlined above—even though she was certain she felt all the sensations that are believed to accompany out-of-body experiences. She saw her body as she floated through the room. felt herself move through space and saw things in great detail. But not, unfortunately, the target object. This is how most attempts proceed. Dr. Blackmore concluded from this experiment that she was fooling herself.

Experiencing the sensations but not getting the results belongs under the heading of multiple endpoints. The experiment was to see if you could discover what was written on a piece of paper, not whether you could feel yourself astrally projecting about the place. Feelings are not part of the test and cannot be used as evidence of a success. This caution will primarily be for those with suffer from the It's Not My Fault syndrome (described in Chapter 14), and it's the first possible refuge for those who seek to explain away their failure. They will claim something like, "No, I didn't see the paper but I could feel myself float and I saw the bald spot on top on my head. That's evidence enough."

No, it's not.

If the test conditions are too hard, perhaps the note is too high for your astral body to see, then go ahead and lower it! But until your astral body can see the paper, you haven't proven anything (as a note: if you are re-running the test to adjust for height, be sure to get a new word).

There has not yet been a confirmed positive test like the one outlined in this chapter. There have been many false reports and many popular arguments in favor of astral projection, but no one has even been able to successfully prove the phenomena is real. The people who most vociferously defend astral projection are

ones who claim that they have experienced it. They have felt the out-of-body sensations as described above. But sensations, as we know by now, can easily lead us astray (remember Scrooge – the least little thing upsets them, "a bit of underdone potato..." etc.). If you, or anyone you know, truly believes in this phenomena, invite them to take this test.

CHAPTER 11

Psychometry

> **psychometry:** The reading of personalities or the seeing of past events by reading "vibrations" and "psychic imprints" left on some object that was owned by someone or that took part in some past, possibly traumatic, event.

Have you seen the movie *Vibes* with Jeff Goldblum and Cyndi Lauper? There is a scene in which Goldblum, who plays a psychometrist, is given a knife. He touches it and, as he feels along the blade, he becomes very agitated, a look of horror spreads across his face. He drops the knife and shouts, "Someone was killed with this!"

The Goldblum character was able to read the images of a bloody crime from the knife using psychometry. Of course, that account is fictional, but some people claim that objects are able to pick up vibrations or imprints of the owner's personality. There are frequent reports of psychics assisting police in the detection of criminals by handling crime scene objects. The psychics attempt to describe the personality of the killer, for example, from a gun found at the scene of the crime.

It's troubling that the "vibrations" imprinted onto an object are never actually defined. The process of how an inanimate object can store information via vibrations has never been explained. Nevertheless, if it is true that objects can store information it's pretty simple to design a test to check.

Today, psychometry is mostly used by spiritualists who attempt to identify the (possibly deceased) people who owned certain objects. Spiritualism is discussed in detail in Chapter 12. The tests given here for ordinary psychometry can be readily adapted for spiritualists.

1. TEST ONE: PERSONAL PSYCHOMETRY

WHAT YOU WILL NEED

- Five friends.
- Five small and five business-sized envelopes.
- A fresh roll of new pennies (or any other coin) from a bank, or brand new identical pieces of jewelry (perhaps cheap rings or bracelets).
- Your notebook.

WHAT YOU WILL DO

(1) Assemble the five people and give them object (penny or jewelry) to hold. It is not necessary to get the people together as a group (at this time). Instruct them to keep it on their person for at least two days for as much time as possible. This gives the object as much time as possible to "absorb the vibrations" of each person.

(2) After everyone has had a chance to hold the object for this period it is necessary to assemble the five people as a group at the same time. **This is very important.** It perhaps will be difficult but, as you will see, it is necessary.

(3) You must leave the room in which the group is assembled.

(4) Each envelope is marked with a number from one to five.

(5) The envelopes are distributed, *in an arbitrary manner*, so that everyone gets one. Each person puts their object into their envelope and one friend writes the number of the envelope each person has in your notebook.

(6) A different friend brings the set of envelopes to you and leaves the room before you begin looking at them.

(7) Open the first envelope. Use psychometry to guess which person the objects belongs to. Write down the name of this person on the envelope the object came from.

(8) The impressions are brought back before the group and you tally the correct matches. Scoring is done via the table below.

WHAT COULD GO WRONG

A score of 5 correct matches, even though it has a low probability of success by chance, is still not overwhelming evidence

TABLE 1. Psychometry scoring table. The probability of getting n or greater correct matching impressions from 5 guesses. As is obvious, all 5 impressions must be correct before there is any real evidence of psychometry. Incidentally, it is impossible to get only 4 correct matches. This is because if there are 4 correct guesses, the fifth *must* also be correct. Inversely, if there were only 4 correct guesses it must be the case that fifth guess was wrong. But this is impossible because the other four objects were assigned correctly (pause over this and think about it for a moment if you don't understand).

Probability of Getting at least n Matches

n	0	1	2	3	4	5
p	1.0000	0.6300	0.2600	0.0920	0.0083	0.0083

that psychometry was exhibited because it is easy to guess which object belongs to each person using ordinary means. This is the sensory leakage problem. For example, suppose one of your friends is an auto mechanic. It is possible that his penny or ring might be smudged with grease. You might not recognize it as such, but the fact that it's a bit dirty may lead you to assign him to the object. You might not even know why you did this unless someone pointed out the dirt.

Sensory leakage can be mitigated, in this experiment, by starting with identical objects. Everyone has a new penny or piece of jewelry, but the possibility of leakage can never be entirely eliminated.

2. Test Two: Meaningful Object Psychometry

This test attempts to capitalize on the idea that the more personal an object is to someone the stronger their psychic imprint is upon it. It's a very easy test to set up but an extremely difficult test to evaluate because the possibility of sensory feedback is strong. This test may never be convincing because of that reason,

but it's included in the book because I want to give you an idea
how easily sensory feedback can be detected even when you don't
expect it.

WHAT YOU WILL NEED

- A few friends, the more the better.
- A medium-sized padded opaque envelope.

WHAT YOU WILL DO

(1) Gather your friends together in one room. You leave the
room.

(2) One person is picked at random. This may be hard to
do. If there were six people you could choose the ran-
dom person with a die. If there are not six get a deck of
cards and hand one card to each person. Everyone must
remember her card. Then gather all cards back together
and shuffle them exceedingly well. After they are shuf-
fled, group them back together and then make one cut.
The top card is matched to its owner and becomes the
volunteer.

(3) The volunteer takes something of theirs, something per-
sonal, and places it in the envelope.

(4) The envelope is then given to you secretly, perhaps slid
under the door of the room you're waiting in. You at-
tempt to exercise your psychometric powers and discern
to whom the object belongs.

Scoring is slightly different because the results depend on the
number of people who have gathered together to be part of the
experiment. The probability of a single success is one divided by
the number of people you have in the room. For example, with 20
people the chance of a random success is 1 in 20 or 0.05. A score
this size is not especially convincing. To be convincing you'd need
about 100 people, where the chance of success is 1% (1 divided
by 100).

With a smaller group of people the test must be repeated. In
this case you should repeat the test 5 times. It must be insured
that for each run everyone has an equal opportunity of being
picked, even if they were chosen on a previous run. The number
of successes that are needed to show psychometric ability also
depends on the number of friends you have. This book would be

TABLE 2. Number of friends scoring table. Here's how to read the table. Look down the chart to find the number of friends you have. Say you have 4. Then look to the number on the right. In this case it's 5. That means, in repeating the experiment five times, you need at least 5 successes, i.e. all of them, to get a score of 0.01 or lower. As you can see, with smaller groups of friends it's very difficult or impossible to get a score of 0.01. This should impress upon the idea that one or two successes in a small group of friends is not at all surprising.

Number of Friends Needed

Friends	Hits
3	5
4	5
5	4
6	4
7	4
8	4
9	4
10	3

far too bulky if I gave you a scoring table for every possible number of friends you have, so instead the table given above shows only one probability score and not several. Normally, a probability is given for each number of successes you might get in an experiment. Here, in essence, only one score with the minimum number of successes you need, conditional on the number of friends you have, is given. That score is about 1 in 100 or 0.01.

The use of the table is slightly more complicated too. A fixed example will clarify. Assume an experiment is to be run with 3 people. The left hand column of the table is used for the number of friends. The number of times the test must be successfully re-run is noted in the second column. For three friends, this is 5. Each of the five runs must be a success too, with no failures. That is, the test does not mean that you can continue re-running the

experiment until you get five hits to get a good score. The score of 0.01 is only reached if each and every trial is a success.

WHAT COULD GO WRONG

Many things. The randomization is difficult because people may forget their card or they might not be honest about the eventual selection (that is, they may cheat). Maybe one friend really wanted to be part of the experiment so he volunteers no matter what. One way to guard against this is to get two packs of cards and hand everyone a duplicate. Then shuffle as before and pick the person who has the card that matches. You can be clever and not announce what the card is and instead ask to see everyone's card. That way no one can switch at the last moment as no one but the shuffler knows who is the volunteer.

The object eventually chosen is an enormous problem because it may be too easy to guess who the thing belongs to by knowing something about the people in the room. For instance, if you were to get an envelope containing a Godzilla key chain you can be sure it was from me. An engagement ring with a barely visible diamond might indicate one of your not-so-affluent friends. Likewise, you might guess that if it's not a ring the object might belong to a man. That might not be true but it's more probable that more women wear rings then men do, and that a woman might be more likely to choose to put a ring in the envelope than a man might.

You might try to eliminate some chance of using ordinary perceptions by not opening the envelope or by handling the object in the dark, but that still doesn't guarantee you couldn't figure out what it was and therefore who it belonged to.

It's also very important that if you are repeating the test that you must not be allowed to know whether any of your previous guesses was correct or not. That's because after the first trial you could get the same object again later in the experiment. It's possible you could even get it two times in a row. And if you knew you were right or wrong on an object before you'll certainly modify your future guesses. The scoring table would no longer be valid because with feedback like this all the probabilities would have to increase, making it less likely we would accept the hypothesis that you have psychometric powers.

3. TEST THREE: REMOTE LOCATION PSYCHOMETRY

Some claim that objects can pick up vibrations from where it has been. This test is a simple adaptation of the third test of clairvoyance (the Remote Location test). A nice feature is that the object used by the psychometrist is known to belong to someone, and they instead try and guess where the object has been.

WHAT YOU WILL NEED

- One friend.
- An object belonging to this friend that you are sure is able to pick up the vibrations of the places it has been.
- Your notebook.

WHAT YOU WILL DO

(1) Go, with your friend, to each of the six locations. Number them clearly on a piece of paper so there is no confusion after the test about which location was which.

(2) Your friend, now alone, then rolls a die and writes down the number on a sheet of paper. She rolls again and writes the second number under the first. She does this 8 times. Your friend must keep this list secret.

(3) The test begins when your friend goes to the first location specified by the roll of the die. She stays long enough so that her object can pick up a sufficient amount of energy to allow you to identify, using psychometry, where it was.

(4) Your friend returns with the object and you try and guess where it has been. During this time your friend should not be in the same room as you. Write down your impression.

(5) Your friend goes to the next location and the procedure is repeated. At the end, tally up the number of correct guesses and compare them against the clairvoyance remote location scoring table in Chapter 4.

Before the test begins you should have a dry run. Bring the object to each of the locations and then bring it back home. Once there, be sure you can read the object, that is, be sure you can ascertain where it has been. Take it to all the places that will eventually be used in the test so that you can be sure you can always pick up the place it has been most recently. Some people

claim that the object will always retain an imprint of where it has been. If this is true, use a new object for each location (a brand new penny as in test one is ideal).

WHAT COULD GO WRONG

The same things that could go wrong with the clairvoyance test could go wrong here too. Go back to Chapter 4 and re-read test number three. It's crucial to have the dry run, to be absolutely sure that the object can pick up vibrations from each location. What is not desired is a round of excuses after the test if it is a failure. Excuses such as, "Well, I didn't know it was the Walmart because the vibrations aren't strong enough there." If the Walmart isn't strong enough pick a better location before the test begins.

Suppose you guessed it was the local McDonalds, but the object was actually at the Mall. But wait! It turns out that your friend regularly goes to McDonalds and so this must be why you feel so strongly that the object has been there. No! It may be the case that the object *does* feel like it has been to McDonalds for the very reason stated. But that is *not* what the test was designed to do. It was designed *only* to test whether you could guess where it actually was. You could always fool yourself by changing the end point after the experiment is over. Do not do this. For example, maybe your friend doesn't go to McDonalds, but maybe she heard a McDonalds commerical on the radio while at the mall, or maybe she saw a cup from the restaurant on the ground. You could go on and on like this to try to tie your guess with your friend's behavior. But none of that is convincing, because you missed that the object was at the Mall.

4. FINAL WORD

For the results to be really convincing, you are going to have to be able to demonstrate this ability over time and in different situations. For instance, it can always be claimed that the tests I've given you are flawed because the objects were not exposed to dramatic situations, like that knife used in the murder. It may be possible to arrange a truly formal test at some crime museum. James Randi once did a similar test by handing an object that belonged to a serial killer to some Russian psychics. They were

not able to discern the nature of the owner, except to make some wildly incorrect guesses about his personality.

I hope you've also realized how easy it can be to tell something about who owns an object just by knowing something about the owner.

There is another branch of psychometry that was only briefly discussed in this chapter. Often a psychic will take an object and base an entire reading of someone's personality and fortune, deriving their impressions on the "vibrations" they get from the object. This falls under the heading of "cold reading" which is discussed at length in Chapter 12. After you've read that you will be aware that the tests here are designed to limit the influence of direct sensory and subject feedback that cold readers turn to their advantage to make it appear, falsely, that they have psychometric powers.

CHAPTER 12

Seances & Spirit Communication

> **seance:** A ceremony where a group of people gather and attempt to communicate with the dead. The person leading the ceremony is called a *spiritualist* or *psychic medium*.

There has been an amazing resurgence in spiritualism in United States. Movies such as *The Sixth Sense* and *The Gift* have spurred audiences to think seriously about the possibility of life after death. Several best-selling books on the topic have appeared. Recently, there is a weekly television show featuring a host who communicates with the dead relatives of his studio audience. Other shows feature "ghost hunters." Spiritualism is once again big business, just as it was about 100 years ago.

Darkened-room seances were enormously popular in the latter part of the nineteenth century and the early part of the twentieth century. Sherlock Holmes creator Sir Arthur Conan Doyle led the celebrity charge for spiritualism. Author Henry James was a regular attendee at seances. Thomas Edison was so intrigued with spiritualism that he invented a machine to speak with the dead. Professional psychic mediums of the era, as now, charged a fee for their services. Because these services were tied to money, suspicions arose that not all was what it appeared to be. Were these psychics genuinely in contact with the dead?

Houdini, probably the most famous magician and escape artist of all time, waged a campaign to expose fraudulent spiritualists. He believed that there were grave difficulties in post-life communication and he was appalled by the idea that charlatans masking as psychics were turning people's grief and misery into profit. Initially, Houdini demonstrated that the effects spiritualists produced during seances could be duplicated by ordinary magic.

One popular seance effect is the production of *ectoplasm*, an ethereally white substance believed to be left behind by the ghosts

of the dead as they crossed through our physical plane. Ecto-plasm seeps and oozes, sometimes in great quantities, from various orifices of the spiritualist's body. Houdini found that ectoplasm, when examined closely, could not be distinguished from ordinary cheesecloth or animal lung tissue (yes, really!). But cheesecloth, when viewed in a dark and emotionally charged seance room, could look convincing.

Seance participants are sometimes shocked when objects, per-sonal effects of their's or of their deceased relative's, drop sud-denly into their laps. These objects, called *apports*, materialize into our world directly from the spirit plane. To produce apports the medium (or an associate of his) gathers, say, a watch or a locket. Then, during the seance, the medium tosses the watch into the air so that it lands on his client's lap. Very few clients question the origin of apports.

Table raps and ringing bells are frequently heard during seances. These feats are accomplished by, among other methods, toe crack-ing, or by a medium slipping off his shoes and grasping the handle of a bell using his toes (a convenient hole is cut in his sock). Rising tables, chalk scrawls on slates, moans from copper horns, etc. are all attributed to ghosts. All are simple tricks.

Houdini sought to maximize publicity for his campaign by demonstrating how these tricks were used to deceive people and by exposing ersatz psychics in the act of cheating. He attended seances in a wig and when he had noticed any trickery he would stand, dramatically peel off his wig, and shout, "I am Houdini! And you are a fraud!"

A debate about the veracity of mediumship raged in *Scientific American* magazine. Its editors offered an award to anyone who could conclusively prove that he was in contact with the spirit world. An official committee created by the journal organized a test with a famous Boston medium named "Margery." Houdini was on this committee and was asked to attend the test. During the seance he caught Margery cheating. Houdini was supposed to wait for the committee to issue its official decision on Margery, but he was suspicious of one committee member's motivations, so he exposed Margery himself in a pamphlet. The resulting debate over Houdini's actions was acrimonious; many accused him of be-ing zealous. He countered that fraudulent spiritualists should not

be allowed to exploit people's weaknesses and desires and that Margery's exposure should happen as quickly as possible because any delays encouraged public belief that Margery may have passed the test[1].

People have generally forgotten Houdini's work, and now mediums with their tales of life after death are again common. It's therefore desirable to know if the claims made by psychic mediums are true. We cannot blindly accept the idea that people are in communication with the spirit world. It's simply too big a concept to embrace without having evidence to back it up.

The possibility of a human essence, or soul, that continues after physical death is a powerful notion. If people's souls do continue after death it seems very natural to ask if the living can communicate with those who have died. The possibility cannot be dismissed without reviewing the evidence. We must be extra cautious testing these claims because our emotions can easily lead us astray. We may be misled quickly if we are not careful because we desperately want the claims of the spiritualists to be true.

My guess is that you will reflexively believe that the dead can talk to the living. This belief is so deeply entrenched in Western culture that, at first, it seems the burden is on the skeptic to prove that we can *not* so communicate. If you believe that, you're making a mistake. Why? Because you have asked the skeptic to do the impossible. Here's an interesting exercise: list the *exact* evidence you require to *prove* that we cannot talk to the dead. Seriously consider this and write down what you think would cause you to abandon your belief—not that you should, of course, but what would cause you to.

Stumped? Would catching a fraudulent medium cheating be enough evidence for you to abandon your belief? Not really, because all you would have done is expose one medium. Would this tell you if other mediums aren't genuine? No. To be absolutely sure, you'd have to test *all* mediums. And even if they all turned out to be fakes, how could you be certain that you haven't missed

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[1]This incident has been written about extensively. Houdini talks of this story in detail in his book, *Magician Among the Spirits*. An off Broadway play *Houdini In Love* is based on a supposed love affair between Houdini and Margery. The play's premise is absurd as Houdini was madly in love with his wife. An affair was unthinkable for Houdini.

someone, or maybe that some new medium has just discovered his powers? You couldn't.

If the skeptics are right and we can *not* communicate with the dead we could easily prove them wrong by providing just one confirmed example of post-life communication. But the skeptic faces the fact that he has to show that an infinite number of mediums are fakes before he can be sure that communicating with the dead isn't possible. Since this is impossible the skeptic must settle for being sure "beyond a reasonable doubt." This term is defined in Chapter 14. The test below can be used to help build evidence to help you (and the skeptic) decide whether or not a spiritualist's claims are true.

1. Testing A Spiritualist's Claims

It will be nearly impossible for the novice to arrange and conduct a professional test of spiritualism for two main reasons: cheating and money.

Only a professional examiner will know what to look for to ascertain whether the medium is cheating or not. Even after reading the guidelines below the novice will not have enough experience to adequately judge the results from a seance; a psychic reading is too complicated a process to investigate easily.

A seance might be expensive because a requisite is access to someone who claims to be a psychic medium or spiritualist. Many of these psychics charge a great deal of money for their services, so readers might consider gathering a group of friends to pool their money if they are serious about attempting this test.

Because of these difficulties, the test detailed below should be viewed as a guideline so that when you witnesses a spirit reading you know what to look for. A ready source for spirit readings is television. Most of these televised readings are transparently fraudulent, which is useful because they are extremely valuable to learn how fake psychics operate. Pay close attention to the comments on what could go wrong.

WHAT YOU WILL NEED

- A psychic medium (a spiritualist).

WHAT YOU WILL DO

- During a seance or spirit reading ask the medium or psychic to name a deceased friend or relative. Ask him something *only* you and the deceased person would know. Have him give as many details as possible about this person.

There isn't much to scoring except to note that if the psychic gives you two or three correct (detailed) statements that he could have only known were he actually in contact with the deceased, then that is pretty impressive evidence in favor of his being genuine.

It's possible, perhaps even desirable, to do this experiment differently. For example, Blackmore and Hart-Davis recommend asking the ghost attending a seance to report on the activities of a person isolated from the seance party. The idea is that seance participants cannot see this person but the ghost can. The authors list several activities a person might do (sitting, standing, etc.). The remote person would pick randomly from one of these activities to do at an appointed time. The seance participants ask the attending spirit to report on which activity the person in the adjacent room was doing. To try this, write six (unambiguous) activities and choose them by a toss of a die. Scoring is again simple because the spirit would never guess wrong. The first wrong answer would indicate that the seance's participants are deluding themselves. Do about eight tests to be sure a good guessing streak can't account for the score. The test given for Ouija boards, described in Chapter 13, could also be adapted in an obvious manner.

WHAT COULD GO WRONG

Basically, you. You are the only thing that can, and all too frequently does, go wrong.

My dad gave me this sage advice: Never pass up the opportunity to keep your mouth shut[2], and if there was ever a time to heed his advice, a seance is it. What do I mean by this?

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[2]No, I've never been able to follow this advice.

By not keeping quiet, you will subtly, maybe even not so subtly, tell the medium all he needs to know so that, if he is fraudulent, he will be able to convince you he is contact with the dead. Let's look at how.

I have in front of me a book entitled *King of the Cold Readers* by Herb Dewey. Mr. Dewey has been a professional psychic entertainer for over 30 years and is quite well-known internationally by his spiritualist name Shadow Man. He estimates that he has presided over more than 100,000 seances (readings) over his career. Dewey also wrote *Red Hot Cold Readings* and *Mind Blowing Psychic Readings.* Dewey hopes to train a new generation of cold readers in the practical and profitable art of psychic and spiritual entertainment. He does an admirable job: his books are thought to be authoritative. "The best in the business today," said Bill Tadlock, former president, Psychic Entertainers Association. "Brings fortune telling into the 21st century" according to Scott Davis, editor, *Seance* magazine. Dewey is not the only author on the subject; there are several journals that teach magicians how to fool people during a seance or psychic reading. Titles such as *Seance*, *Pentagram*, and *Invocation* are filled with clever ideas on how to trick *you* into believing psychic performers are in contact with the dead.

The most common technique mediums use, and the one on which Mr. Dewey is an authority, is *cold reading.* A cold reading does not require props or set up and the results from using it are very convincing. What is cold reading? According to Dewey himself (from *King of the Cold Readers*):

> Cold reading is the term used to describe the method of fortune-telling, in which the psychic, or reader, approaches the client, or sitter, 'cold', knowing little or nothing about the individual, who usually is a stranger. By observation and deduction, the psychic fits the person into a category, and launches into a formula reading [p.10].

So there you have it. Psychic and seance readings are based on formulas—loosely arranged scripts that cover several key topics, and guidelines for handling information received from a subject. To hear what these readings are like turn on the radio or

television and listen to any "psychic" (try those that advertise 1-900 phone services). Cold reading is used interchangeably in both fortune telling and spiritualistic readings. In fortune telling the psychic tells you about you. In spiritualist readings the medium tells you about someone you know. More specifically, the reading focuses on how some deceased person interacted with you. The reading doesn't necessarily emphasize details about the deceased person. That last point is important because the psychic can only tell how well he is doing by using your feedback. You will only be convinced the reading is genuine if the medium supplies you with details about the deceased that are known to you. He can give explicit details about the deceased, but if these details don't mean anything to you, the reading cannot progress very far. It is true, however, that people can become convinced a medium is honest simply because he has supplied a wealth of explicit details about the deceased, even if these details were unknown or not true. This is because people are impressed with the intricate tales these story-teller mediums weave. During the course of the reading many think, "No one can make that kind of thing up!" or, "Why would anyone lie about this?"

Maybe for money?

Here's an example of a cold reading. A friend of mine went to a psychic and, she claims, before she spoke a word the psychic said, "You have a problem with your boyfriend!" She was shocked. The psychic was exactly right! Let's agree that she was correct when she said she did not speak first, which might not be the case. Not that my friend is lying, but perhaps misremembering (we'll come back to her case in a moment). The point is, and all cold reading books agree on this, people *never* remember the details of a reading. People arrive so willing, even needing, to believe in psychic powers that they frequently (perhaps always) invent things the medium or psychic said. I cannot stress this enough: you will, if you want to believe, not remember what happened during a reading. You will invest the medium with powers that he does not have. You will recreate events that never happened in order to better prove (to yourself and others) that the psychic was genuine.

During the course of a reading the medium/psychic might say something like, "I see a trip, a journey. I get a definite impression

of some sort of travel. Maybe near or even possibly far." At which point the gullible client might blurt out, "That's exactly right! Bob and I went to Florida together before he died!" Later, the client will tell her friends, "The medium told me that Bob and I went to Florida and *there was no way he could have ever known that!*" Well, he didn't. All he said was that there the *possibility* of a trip. A long one or a short one. That one statement covers *all* scenarios. Just think (it doesn't matter whether this is a seance or psychic reading—the technique is the same): is there anyone alive who has not taken some kind of trip? You could interpret "trip" to mean a visit to the mall, a safari in Africa, or a drive on a pleasant Sunday afternoon. But even if we could find a "tripless" person the psychic could claim that he was talking about a *future* trip, one not yet taken.

After the medium makes his prediction he will pause for you to talk. If you don't immediately give the medium some feedback he might ask, "Do you know what I am talking about?" trying to prompt you into admitting he is right, or trying to get you to divulge some facts about the journey. He can then use these details to embellish the reading.

There may not have been a trip. It could be that you and the deceased had only planned a trip but never made it, or merely talked of how nice it would be if you went somewhere together. On the other hand there might have been hundreds of trips—the psychic counts on you to focus on one and bring it to his attention.

If the trip prediction doesn't work, if it doesn't ring any bells, the medium will quickly pass from it and maybe say something like, "Ok. I'm getting a strong feeling of pain, possibly an illness, maybe an accident. There is a sadness..." Well, if he's talking about the deceased he's got a hit! Why? Because something caused the deceased to cease. And again you will be the one to supply the answer. You will volunteer details, "Yes, my father had cancer. It was very painful for him." Later you will tell friends, "The medium must have been talking with my dad because he knew all about the cancer!" He knew nothing—nothing except what you told him.

Back to my friend. The guess the psychic made about her boyfriend seems, at first, to be impressive. But look at it this way: this psychic sees hundreds of people yearly and the vast majority of young healthy women who come to see him have some kind of

problem with their boyfriends or husbands. She didn't have an engagement or wedding ring so the reason for her visit wasn't her husband. She was young, she looked healthy. The prior probability that the psychic is right when making the statement, "You are having problems with your boyfriend" is very high. And in those rare instances when the young woman isn't having a problem, the psychic has two outs. He can say you *will* have problems, or, if the young woman has no boyfriend he can claim that *this* is the problem. No matter what he has a hit.

Multiple end points were introduced in Chapter 2. Cold reading exploits multiple end points with a vengeance. Specific questions aren't asked in a seance or psychic reading, it is not a proper experiment, and thus what it means to be a success is never defined. This allows you and the medium/psychic to skew the meaning of the (one-sided) conversation so that whatever happens or is said is defined *after the fact* to be a success. Think of the scoring tables. We count up the number of hits and see how surprising a result would be if only chance operated. We calculate scores using knowledge of the random probability of the event we're studying. For example, in guessing tosses of a die we know there is a one in six chance of getting any spot. But when a medium speaks we don't know the probability of any statement being true by chance. This creates problems. The medium generates his statements so that they could be true in almost any situation (recall the examples above). This means that no number of hits would be surprising because, by definition, all statements have a high probability of being true. In the cold reading scenario there is no way to show the medium is genuine.

How can you avoid giving information to the medium, information that he could use to fool you? By being diligent. Carefully control any outward display of emotion, and ensure you do not indicate whether the medium is right or wrong on any statement until the reading is over. This will not be easy. It may be the hardest thing you have ever done because your natural inclination to cooperate and innate politeness will cause you to feel guilt that you are not being friendly. It won't be nice to not play along. You have to steel yourself, you have to harden your heart if you want a valid test, because if you don't you will never ever be sure if

the medium was genuine or it was a case of you not keeping your mouth shut.

To help you in this task it may be wise to bring a friend who is very good at controlling her emotions. She may not be able to control you, but she will be able to critique your, and the medium's, performance after the reading is over.

There are other methods to check the medium's sincerity. A time honored trick is to ask the medium to bring you a message from dear departed Uncle Charley. What? You don't have an Uncle Charley? Well, that's what makes this test so powerful. If you did get a message from Charley you might begin to get a little suspicious. Although, watch out, many mediums are on to this ploy. There is nothing wrong with using it twice, however. After they claim they can't see Charley ask them about great-grandma Edith (who is also conveniently missing from the family tree).

Sophisticated psychics and mediums (like those you see on TV) will rarely fall into this trap, no matter how cleverly it is laid. Instead, they will keep working you, and pump for information. If you are uncooperative they will claim they can't connect with the spirit world at that time, or the vibrations aren't right, or even blame you for being too skeptical. You have to be a very good actor to convince them you actually do have an Uncle Charley. It can be done—and has been—but it's not easy.

Here are two general rules:

ALWAYS ask for specific information. It's strange that once a ghost has managed to make it all the way back to the land of the living they never have enough energy to answer specific questions. They can go on all night in generalities about how nice they are doing, they can hint at the first letter of their name[3], they can say how warm it is, say how they miss you, and can tell you not to worry. But when it comes time for you to ask, "Remember the secret thing you always used to say to me?" they suddenly can't stay any longer and have urgent spirit business elsewhere. Very, very strange.

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[3]This is always a sure sign of a bad cold reading. Professional magician's wince when they witness this hackneyed strategy being used. Incidentally, the best known TV medium uses this technique frequently.

NEVER ever volunteer information to the medium. After all, they don't need it if they are genuine. They are only acting as an instrument through which the dead can speak. "I see a woman," they'll say, "Does this woman mean anything to you?" Who out there doesn't know a woman? Keep control of your emotions and be critical. This does not imply you should be cynical, but do not automatically accept every statement the medium says as truth. Above all, keep still and stay silent as much as possible.

2. FINAL WORD

Spiritualism has not yet reached the fever pitch it did 100 years ago, but there is always the possibility it will, especially if people uncritically accept every claim that is asserted by the newest batch of spiritualists.

Despite the thousands of anecdotal accounts of ghosts and angels and communication from the great beyond, there has never been any direct and irrefutable proof of post-life communication that has stood up to close scrutiny. Official rigorous experiments like those outlined above have been conducted. None of these tests have been successful. What usually happens in these tests is that the medium becomes angry or upset that the subject is not being cooperative or more forthcoming. Some mediums blame their poor results on "negative skeptical rays." It's true that some mediums do not realize how much they use subject feedback, that when this feedback is removed these mediums because confused about how to proceed. Some, like psychic entertainer Mr. Dewey, know very well how important feedback is and, if the information is not forthcoming, are not above using anger to intimidate their subjects. In either case, psychics and mediums are stumped without a constant flow of information provided to them by the subject.

Experiments can be designed to test the accuracy of *specific* statements made by mediums. These experiments are important because some statements made by psychics during a reading are correct. How can we account for this? A recent and widely publicized study[4] claimed that professional mediums were able to correctly guess specific information about a deceased person. The

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[4]Published in the January 2001 edition of the *Journal of the Society for Psychical Research.*

study paired a psychic with a control group of college students. Both the psychic and the control group were allowed to question a relative of a deceased person. In order to guard against the possibility that the relative would inadvertently volunteer information he was allowed to answer only yes or no to the questions put to him by the psychic and students. The study claimed that the success rate of the psychic was nearly twice as high as the control group, thus proving the psychic was in contact with the deceased.

To compare the success rate of the untrained control group with that of the medium's is invalid and bad science. Here's why.

Assume the following experiment where the only feedback allowed the medium is the sitter's yes or no answers to the medium's questions. Let's say the following dialogue took place.

"I see the deceased was a man?"

Yes.

"I see facial hair. Did he have a moustache?"

Yes.

"I sense the presence of a disease. Did he die of a heart attack?"

Yes.

And so on. A hit rate of 100% for the first three questions, which appears impressive. There are three problems. The first is the uselessness of the percent correct score due to correlation between questions, multiple endpoints of the answers, uncontrolled question difficulty.

With the information gleaned from question 1, the chances that the medium could accurately guess the answers to questions 2 and 3 has increased. That is, the conditional probability—the chance that the statement is randomly true given that the previous statements were true—that someone died of a heart attack given he is a man is greater than the unconditional probability that a random person (man or woman) died of a heart attack. Likewise for the presence of a moustache. The conditional probability of having facial hair is certainly greater than zero given the deceased is male, and just about zero if the deceased is known to be female.

Multiple endpoints are also a problem. Once the medium knows the deceased is male, she can steer her questions to those in which the probability of a positive response is greater. For example, once

she knows the deceased is male she is very unlikely to ask whether or not the deceased had a hysterectomy. She can instead ask about prostrate cancer, whereas she never would have if she knew the deceased was female. An experienced medium, knowingly or not, will be able to steer the conversation in any direction she desires, making correct guesses more probable than not.

Question difficulty is also problematic. Imagine the following (trivial) question from the medium:

"I see that the person had two hands. Is that correct?"

Yes.

The base rate probability of this question—how true it is for the general population—is absurdly high (although certainly not 100%). Is it the least bit interesting that the medium got it right? No. Therefore, raw percentage of number correct scores are not indicative of true psychic abilities. Likewise, comparisons of a medium's guesses to guesses made by random people off the street are not interesting. Percent correct scores do not allow us to compare the extent of the medium's inductive abilities against her psychic abilities (if any).

A well-formed score would account for the conditional probability of each question asked by the medium (for the relevant population; e.g. how many men have beards and have died of a heart attack). Such scores are called *skill scores* and they find wide use in meteorology, among other fields.

I highly recommend reading the book *The Psychic Mafia* by M. Lamar Keene. The book is the memoir of the time Mr. Keene spent as a psychic medium. It is probably the best popular treatment on the subject of how seances and psychic readings are rigged and how psychics cheat. He discusses the extremes unscrupulous spiritualists will go to con people out of enormous sums of money. When Mr. Keene started his career as a phony psychic he "discovered that people will pay any price to communicate with their loved ones." He and hundreds of other fake mediums unflinchingly charged that price.

Recall the trick of asking the medium about non-existent Uncle Charley. Here's a passage from Mr. Keene's book describing a reading he gave to a wealthy client to show you that this ruse is not a fail safe procedure:

At one point during a seance she said, "Jack (her dead son), I want you to call me what you used to call me."

I knew it was a test. The only thing I could do was to laugh and put her off by having Jack say, "I'm going to surprise you one of these days and do that."

When Bertha left I thought, How the hell am I supposed to find out what it is she wants to hear? She was too good a touch to lose...

Finally, one night a group of us from the church went to her house...Somewhere in that house (was) ... the information I needed.

Well, I found it. In Bertha's family Bible...Her middle name, Lona, it turned out, was a nickname for Apalonia. That, I felt sure, was the clue I needed.

I researched Apalonia and found it to be the name of a saint who was famous for curing toothaches ...

At the next seance her departed son, Jack, recited the names of all the other members of her family—which I'd copied from her family Bible—and then called her Apalonia, saying he was getting "the vibrations of a toothache."

That did it! She was completely satisfied and, her faith in my mediumship reconfirmed, the generous donations resumed. *And her case was typical of many.* [italics mine]

Keene has an entire chapter titled, "The Name of the Game: Money, or, The Spirits and the Swiss Banks," that beautifully illustrates that the chief reason for the spread of spiritualism is the love of money. Your money.

Be critical when approached by a medium or when viewing a psychic on television. Watch with a wary eye. Pay attention to the exact words and phrases employed by the psychic. Also understand that any TV show is heavily edited and what you see is probably not what you get. It's common to edit the programs

in favor of the mysterious—after all, who wants to watch a show in which the psychic repeatedly fails? Even if you strongly believe in life-after-death communication it can be a useful exercise to actively look for evidence that the psychic you are watching is fishing and using cold reading techniques. Prepare to be surprised.

CHAPTER 13

Other Tests

near death experience: An experience that some people
have after have been declared "clinically dead," i.e. after
their heart stops but before their brain has ceased func-
tioning. Common experiences are the feeling of floating
down a tunnel towards a bright light, and the conviction
that the body has been left behind.

This chapter outlines effects that are either not directly linked
to standard paranormal phenomena or are very minor but still in-
teresting enough to assay but that cannot be easily tested. Things
like near-death experiences and magick are included. Any exper-
iments suggested here are more difficult than in the preceding
chapters and should be viewed as examples of the direction one
should go in designing a test and not as the final word. One of
the difficulties in experimental design is that psychic and para-
normal phenomena are so varied that it would be difficult to list
appropriate tests for all situations.

1. Near Death Experiences

Are there any volunteers willing to test this phenomena? All
that is required is that we stop your heart, cut off your oxygen
supply, and monitor your brain wave patterns until all activity
ceases. Oh, yes—then we try and revive you. If you can manage
to recover, all you have to do is to write down your experiences.

One parapsychological researcher, Susan Blackmore, has at-
tacked the problem head-on in her book *Dying to Live: Near
Death Experiences.* She asked the question, "What would hap-
pen and what sensory excitations would someone experience as
their brain was deprived of oxygen?" That is, when they are dy-
ing. Can this research give an answer to some common near death
experiences such as "traveling down a white tunnel"? Surprisingly,

the answer to this is yes. If you have any interest in this topic, I urge you to read Blackmore's insightful book. What she has shown is that ordinary biology is able to explain all the common sensations people claim when they have a near-death experience. Everything from the feeling of looking down on their bodies, to seeing a bright white light, to traveling down a long tunnel, can be explained by what the body does as it shuts itself down. Since this is the case, alternative explanations, those invoking the spiritual or psychic are unsatisfactory next to those explications given by neurochemistry and other hard sciences.

2. Lie Detectors

Lie detectors share some attributes of paranormal phenomena and need to be evaluated just as critically. Imagine that you claim you have built a strange machine that attaches to someone's body and has the ability to ascertain whether this person is lying or telling the truth. Are humans that obvious, do we give off "lying rays" that these machines pick up? The better question is, do lie detectors work? No. They do not "work" in the sense of unequivocally detecting lies and identifying truth, but they are useful to a certain degree.

Imagine that you are guilty of a crime. You are brought into a room, told to be quiet, strapped into a chair, the straps holding your chest and arms tightly. Electrodes are placed on your wrist and head. A blood pressure cuff is tightened around one arm. A large man tells you not to move a muscle. He tells you not to talk. He says, "Only answer yes or no when asked a question." You are not allowed to offer explanations to vague questions. The man stands behind you. Before you is a bare wall. You can hear him playing with the machine but cannot see him. And then the questions begin...

At the end of the questioning, he may say "You know, it looks like we have a problem with one of the questions. Can you help me out?" You may try to say no but he'll insist something is wrong. He may show you some squiggles on a piece of paper that prove something is awry. At this point, if you have a weak and guilty conscience, or are easily intimidated, you may confess.

This is a simplification of the process. In practice, it is worse than what I have described. Many lie detector operators, before the questioning of a subject begins, almost always have an opinion on whether the subject is guilty or innocent of the alleged crime. This unstated opinion profoundly influences the tone of the questioning and the ensuing results. Studies have verified this.

One compelling study used a manager from a convenience-mart and several lie detector companies to ascertain which of several employees stole some money out of the till. Before the questioning of the employees began, the lie detector operator was told something like, "You know, we really think it was Mary, but we have to do these tests anyway because my boss wants them." In each case, the detector companies agreed that Mary was the guilty party. Other names were used and in each case whichever name the manager suggested was guilty was "confirmed" by the lie detector. As I said, it was a beautiful study because of one thing I haven't yet mentioned: there was no stolen money! The entire thing was a set up.

Lie detectors are not allowed to be used in court as evidence for this reason: they do not work. Nevertheless, some people cling to the belief that they do. Tests to prove the unreliability of lie detectors are very easy to develop, and I'll give a brief description of one.

Have a set of subjects agree on a set of true facts. These may be anything, including the subject's names, birthdays, or car type owned, whatever. Have these subjects interviewed by a lie detector operator who asks each the same set of questions about each of the set of facts that was agreed on. Before the questioning, one of the subjects is told he must lie on one of the questions. This question is also randomly chosen and the subject must not tell anyone it is he who is the liar.

Afterwards, a lie detector analyzer (not the same as the operator to whom he should have no communication) must be able to go through the results and identify the liar *and* the question lied about. Obviously, this needs to be done a number of times to eliminate the possibility the operator was correct by chance. The subjects must also not give away they are the liar or truth teller. The restriction that the operator not analyze the results can be relaxed, but its purpose is to test the idea that any analyst who,

given the output from a lie detector, should reach the same conclusions. If not, then the test is at best of limited value and at worst useless.

No lie detector has *ever* passed a test like this. The reason is clear: they do not work.

3. ALTERNATIVE MEDICINES & FAITH HEALING

Practices such as crystal healing, homeopathy, chiropractory, and aroma therapy are not too far away in operation or in explanation from psychic phenomena. They are all founded on untested assumptions and promise to perform actions without the need to spend the effort to learn traditional methods. This is another area where the nasty problem of belief creeps in. No sick person wants to believe in something more desperately than a medical cure for what ails them. People will go to great lengths to protect themselves from disease or to convince themselves that death can be put off just a while longer, maybe even indefinitely.

It's not easy to test alternative medicines and therapies. There is an entire branch of modern-day statistics, called biostatistics, devoted to the topic of medical testing. Studies investigating medical cures must be carefully controlled for many reasons. One of those reasons is that new experimental medicines and treatments may be dangerous and may have unanticipated side effects. Large groups of people must be followed for long periods of time to account for the fact the new treatment or medicine may interact with other medications the subjects may be taking. There may be interactions with lifestyle variables such as smoking or fat intake. The list is seemingly endless which is why studies like this are so time consuming and costly and why the results must always be viewed with a skeptical and cautious eye. For example, who hasn't had the experience of reading that the "latest study" has shown vitamin "P" is good for you can reduce risk of cancer, only to read two months later another "latest study" that shows excess vitamin "P" increases risk of breast cancer in women? You get the point. Be cautious.

Then there is the biggie, the strangest and weirdest effect common to all medical studies: the *placebo effect*. For those who haven't heard the term before, the placebo effect describes the

positive benefit that any treatment or drug gives a patient re-gardless of whether the treatment or drug actually works[1]. For example, in some clinical trials of a new drug roughly half of the patients are given the actual drug, the other half receives sugar pills (placebos: which are identical in appearance to the real pills). Some studies also follow a control group which does not receive a drug nor placebo. Patients and the doctors administering the tests have no way of knowing whether they are in the placebo or test group. But it turns out that *a lot* of people in the placebo group (those who received the sugar pills) exhibit improvement and experience similar healing effects that the people in the test group do. A typical example will help demonstrate what occurs.

Imagine the new drug to be tested is a headache powder. A measure of the drug's effectiveness is how long it takes for a headache to cease. Say people who take the drug have their headaches cease after an average 20 minutes. The people in the placebo group have their's cease after an average 30 minutes while those who take no drug or no placebo have their headaches cease after an average 45 minutes. The difference between the 20 and 30 minutes tells us that the headache powder works, but what is astonishing is that the placebo group does better than the control group when neither of these groups took any medication! What the placebo group had that the control group did not was the innate healing power of their minds.

Since the patients had no idea if they were in the placebo or test group, the physician would explain to both what the potential benefits (and side effects) of the new drug would be. Based on this knowledge alone the patients receiving the sugar pills *expect* to receive the drug's benefits and thus do to some extent.

Alternative medicines should thus be tested in the same way as "main-stream" medicines else the results are meaningless. Why? Because of the placebo effect: if the patients know which group they are in they can allow their own minds to influence the out-come, regardless of the treatment! Recent studies in acupuncture suffered from this flaw: the patients receiving the treatment knew they were receiving the treatment (i.e. they felt the pins) while

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[1]I use the word "works" in the biological sense of "doing chemically what it purports to do."

those in the control got nothing and knew it (i.e no pins). The results from these studies seemed to indicate acupuncture worked but we cannot be certain that the positive effects were instead caused by the placebo effect and not the acupuncture instead. A better test would have been to have me, or you, or any other non-expert in acupuncture do the actual poking of the pins.

For example, a team of expert acupuncturists would draw up two charts of the body. The first chart would be the real one, the one which indicates where the needles should really go to produce the positive effects. The second chart would be a series of false locations. Locations where sticking pins would have a negative or null effect. A group of ordinary people, unschooled in acupuncture would be trained how to stick a needle into a body in a sterile fashion and then, without any knowledge of which chart is which, these people would start sticking patients *who also do not know which group they are in*. At the end, measures of the cure would be taken for both groups and compared. A significant difference in favor of acupuncture would be convincing. A test like this has never been done and thus we should all reserve judgment on the true efficacy of this treatment.

The reason unschooled people have to do the sticking is that experts would certainly give off indications (perhaps by certain types of body language) that the patient should expect a positive or negative response. They wouldn't be able to help themselves and they wouldn't necessarily do it on purpose.

The same statement goes for other alternative treatments like homeopathy, chiropractery, kinesology, chelation therapy, iridology, etc. *All* of which have not been conclusively demonstrated to be better than cures induced by the placebo effect.

4. Magick

Witchcraft, sorcery, and magic spells are forms of *magick*. Magic spells can be tested, although testing is tricky and time consuming. You need a friend who is willing to copy down a specific spell, the use of which causes only one thing to happen. He should prepare two copies, one an actual copy of the spell, the

other a copy of the spell that has been changed so that the effect will not be brought about or is the opposite of what is desired. It might be best to have your friend check with an expert. One shouldn't be too difficult to find: check occult bookstores for witches or in the yellow pages under "Wicca."

The desired outcome, the reason you are using the spell, should be something repeatable: a great example is luck in winning the lottery. What you do is prepare one spell and bet on the lottery. Keep track if you win or lose. Then prepare the second spell and bet again. Do this many times for each spell and total the winnings.

The placebo effect in magick can be enormous. Say you're interested in casting a love spell. You mix the potion and then watch for a reaction from your potential beloved. Wouldn't the idea that you have imbibed a magick potion embolden you just a little, maybe to the point where you actually work up the courage to talk to the man or woman, whereas before you would not have? And if you did, how can you be sure it was the potion that gave you the courage or the idea of taking the potion?

You can imagine many situations like this. Rigorous experiments to discern the efficacy of magic potions are really no different than regular medical experiments, and therefore very difficult to conduct.

5. Numerology, Tarot Cards, Palmistry, & "1-900-Psychic"

Numerologists, palmists, and telephone and store-front psychics are all of the same genre: people who attempt to read your fortune. Of course, numerologists do this with differing and bizarre concoctions of numbers first primed with data such as your birthdate. Palm readers, of course, do this by assessing different creases in the skin of you hand. And psychics do this by just talking about "sensing" and "vibrations." There are many other ways of divination (the art of telling fortunes) from casting runes to examining chicken livers, but at the root they are all the same. Each purports to tell you intimate details about your past and future life without having any prior knowledge. This would be great if true, so we

should have a way to test whether psychics are on to something, whether or not they really can foretell the future.

Numerology, Tarot readings and such can be tested like the second test for astrology. As such, this is not an easy test to do. The best thing you can do if you are going to consult a practitioner of these arts is to tell them *nothing* about yourself. That is, you want to see how good they can divine your true nature without you giving them any clues. But even if you keep your mouth shut the entire time you are more than likely going to rate a "psychic" as being accurate even if they are complete frauds. Why? As always, an example best illustrates the point.

We are in the realm of cold reading once again (see Chapter 12 for an introduction to cold reading). This is the technique that is always used by fortune tellers to give readings. The psychics start out by telling you things like, "I feel that you are a sensitive and caring person, but a person who knows how to get tough when they have to." Or, for predictions, perhaps something like, "I want to say that you might have a change in your financial situation. I see the possibility of more money coming your way, although there are also clouds of darkness which could mean you will lose some money or have to spend some you did not plan." These two statements are true for nearly *every single person on the planet* and it is no surprise that you should rate them as accurate. Most subjects don't settle for vague possibilities like, "I see the possibility...of a change in your finance." No, at this point, over eager subjects (like yourself if you're not careful) chime in and assist by stating "Oh yes! Bill and I were going to open a new checking account!" Afterwards this subject will, nine times out of ten, tell her friends that "The psychic told me that Bill and I were going to open a new checking account! There is no way she could have know that!"

Well, she did not, of course, at least not until you told her. It is a fact that people have terrible memories when it comes to psychic readings. It has been proven time and time again. Do not add further evidence to the pool! Be smart and go into a psychic reading with your eyes open. We'll use a phone psychic for an example of how to do this. What you want is for the psychic to, without your prompting, be able to discern the *exact* question you have on your mind. And, having done that, you want her to

accurately give the answer, still without your comments. Do not *ever* fall into the trap of giving information to ridiculous pseudo-questions from the psychic like "I see a masculine presence. Does that mean anything to you?" No matter what you say the psychic will answer with "Oh yes, that's right," as if she knew all along.

But even if you do all of this, you'll still be fooled. How? For the answer we go back to Mr. Dewey, the spiritualist who wrote what many consider the bible of cold reading (discussed in Chapter 12). He forces home the importance that, *for every reading*, seven key areas of human concerns must be covered. Each of these seven must be spoken of each and every time a reading is given. This is done because the subject will only remember the one area in which they have a question and will forget that the other six were mentioned. It happens all the time, without exception, and it makes lots and lots of money for psychics. Incidentally, Mr. Dewey says the seven areas are: Travel, Health, Expectations, Sex, Career, Ambitions, and Money. For word puzzle fans, pick the first letter from each of these seven areas and form two new words with them. The answer is: THE SCAM. Curious[2]? His other books give word-for-word readings that psychics can use for all sorts of personality types like gay men, physically beautiful women, etc. All bases are covered, including yours. Do not be easily fooled.

You are now equipped to go into a reading and better assess the results. You might try tape recording the reading. But be careful as many psychics do not want you to do this (for obvious reasons: and in some states it is illegal to record calls unless both parties agree, so check first). When you are finished, try and write down everything that they said, and I mean everything. If possible, compare your reading to a friends and see if the same cold reading techniques were used.

The ultimate phone psychic test. Once connected to the psychic tell them nothing but ask this: "What is my name?" Then say nothing. No grunts, no sighs, no rattling the phone, nothing. If the psychic complains tell her, "If you were really psychic you would be able to tell me my name." Be cooperative and think strongly of your name. After all, it is your money on the line here and you want to be sure that you are talking to a genuine psychic

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[2]The acronym is not a coincidence: Dewey designed it this way.

not one of the myriads of imposters. If she is psychic she'll get it. Do not, under any circumstances, fall for the old "I see an masculine presence" ploy or the "I feel the letter S" nonsense or other such distractions. And do not let her start the rest of the reading before she gets your name. Either she has the whole name or she has nothing. If she cannot get it, politely thank her and hang up.

If she does get it, she must pass one final test. After all, your name might be Mary which is not terribly uncommon. Next ask her what is the name of the person closet to you. You can say, "What is my husband's name?" or, "What is my daughter's name?" And then do as before. If the psychic gets both of these, you're probably on to something, but still be careful and listen for the standard cold reading gimmicks.

Can anything go wrong with this test? Lots: the psychic has learned your name beforehand. She could do this through credit card information you gave her, or because you were referred to her by a friend. She could also have some form of Caller ID or marketing list—where she could also learn what city you live in. Be utterly certain there is no way she could have learned your name except by telepathic means.

6. Dreams

There is an enormous pile of literature on the psychic functioning of dreams. Nearly all of it is anecdotal, meaning not based on any evidence. The function, purpose, and mechanisms of dreams are stated in breezy tones and there seems no way to sort out any fundamental facts about what dreams are. Using these books to devise a test to determine the psychic functioning of dreams is nearly impossible. It's better to focus on one area that most authorities agree dreams are good for: predicting the future (precognition in a subconscious state). Designing a test for the accuracy of dreams predictions is very difficult too. Why? Let me illustrate by telling you, briefly, of the dream I had last night.

I was near a house, perfectly square with a tall spire. The house was on a lake, which somehow managed to freeze even though it was summer. Hail fell from the sky. I went into the house and discovered that the phone, very odd in shape, was busted. I

fixed it. Then, as the hail accumulated, I went outside and gave sled rides (on my back) to the shorter members of my office. Oh, yes, there were also tornadoes, fairly harmless ones kicking up spray and knocking a few shingles off the house's roof. My parents also showed up wanting the rent the house for the summer. They were amazed that I had fixed the phone so well.

As I said, that is my dream briefly. I write this in the morning so I have pretty good recollection of the dream, but the images fade through the day and are mostly forgotten by nightfall. Just to emphasize, though, there were many more details that I am leaving out, particularly the segue into that dream from another, more bizarre, one I had earlier in the night.

What, if anything, is the dream trying to tell me? I have no idea. Does it mean, since I saw a phone, that I will be getting an important call? Today? Soon? When? Or does it mean that I'd miss one (the phone was busted)? Maybe I was digging up some old memories of my military days when I used to fix phones. What of the house? I recall being impressed that it was perfectly square, yet deceptively spacious inside. Why did it have a spire? Phallic symbol? The tower was unharmed by the tornadoes. What would Freud think of that? Does it predict anything? Am I to go sledding with short people soon? Maybe it means I'll lend a hand to someone. Loaning money perhaps. Maybe it means I will meet these people by some water or where there is ice (in a drink perhaps, or snow, or a hockey rink—I work near Madison Square Garden and it is hockey season).

I could go on and on like an psychoanalyst, but you get the point. We're back into multiple endpoints. There are a nearly infinite number of possibilities to this, or any dream, and sorting out which meaning is the appropriate one *before* the event happens seems to be impossible. I can always come back later (today, tomorrow, ten years from now if I like) and say that the dream meant X. In that time I'm very likely to forget details of the dream and I may very well convince myself that, after X happens, the dream meant X all along.

Should we give up then? We can always turn to science and ask the cognitive neuroscientist to explain dreams to us. These scientists are beginning to understand the nature of dreams, but even if they can explain their biological functioning, even if they neatly

delineate the mechanisms of dreaming in the most rigorous manner, we are still left with the possibility that dreams are somehow predictive of the future. Unless the scientific theory specifically precludes it dreams may be able to foretell the future. We still have to find a way to test this.

One possibility is to adapt one of the earlier tests of precognition (see Chapter 5). Suppose a deck of cards is to be shuffled at some appointed hour and your job is to dream of the top card after shuffling. You could wake up each morning and interpret, the best way you can, which card the dream is trying to tell you.

This approach is unsatisfying because of the supposed serendipitous nature of dreams. That is, we may not be able to control what they are going to tell us, but they certainly are going to tell us something. And it's not clear that each and every dream is going to be predictive. Only occasionally may dreams give a view into the future. How to tell which ones?

Another idea is to keep a dream journal. Every morning write down the details of your dreams. That part is easy. The next part is not.

There has to come some point where you look back at the dream and try to see whether it predicted something. Say a long lost friend has suddenly called you. Do you use last night's dream, or reach back further? And what *exact* details mean your friend was going to call? Recall my seeing a phone in my dream. Does this count? And even if you dream specifically of your long lost friend calling you have to rule out other non-psychic reasons why you might have dreamed that. Perhaps last week you were talking with another friend and you happened to mention that it sure would be nice if old Long Lost would contact you. Maybe your friend gave her your number. Maybe you've been searching for Long Lost for a long time, and many people know about it. Maybe you've had this dream before and none of the other times did your friend call.

The list is, again, nearly endless. Beyond the reworking of the precognitive tests I have outlines, no foolproof experiment on the predictive nature of dreams has yet been proposed. And as you can see it's unlikely one will.

7. OUIJA BOARDS

The discussion of Ouija Boards is separated from Chapter 12, even though the goals of both procedures are communication with the non-living. Ouija boards are almost always used informally, that is, not by professional mediums. An Ouija set consists of a board with the letters of the alphabet and the words 'yes' and 'no' printed on it. There is also a wooden plank, or planchette, pointed at one end, that participants are supposed to rest their fingers. Questions are asked of spirits and the planchette is to spell out the answer letter by letter or by pointing to 'yes' or 'no'. The idea is that some lively spirit has the energy to move the hands of the seance participants and so direct the answers.

(If you haven't read Chapter 9 on dowsing and of the ideomotor effect, now is a good time to do so.)

The problem with the Ouija board is that you cannot be certain that the answers generated by the movement of the planchette were generated by spirits or, knowingly or not, by the seance participants. Ask yourself this: how come a spirit can find the energy to push around the hands of the people holding the planchette but cannot just simply push the planchette alone? The thing only seems to work when people are pushing on it (and the instructions do say, to help get things going, to put it in motion with your hands). Because of this it's impossible to eliminate the suspicion that the planchette is being purposely pushed where someone wants it to go.

Here's a very simple test that you can try. Get a box, like a jewelry box, anything that has a closed lid and is opaque. Inside this box put a coin such as a quarter. During the seance shake the box vigorously so that the coin flips randomly. Then ask the spirit, "Is the coin showing heads?" The spirit, if real, can direct the planchette to 'yes' or 'no' as appropriate. If you are worried the spirit cannot somehow see in the dark (though all seances seem to take place in a room dark enough so that people cannot see what is exactly happening and who is doing what), at the end of the shaking crack open the box and slip in a lighted pen light. Be sure no one can see the coin when you're putting in the pen.

Since by chance you can guess one or two coins right, to be more certain you should do the test about eight times (which still

has a probability 0.004 of occurring meaning that if this experiment were done about 250 times we'd expect at least one success by chance alone). As in the seance test, any failure at all shows that you are not dealing a real spirit.

As I said, it may be the case that some people unknowingly push on the planchette, directing it towards answers they desire. This effect has been seen with other psychic abilities, such as dowsing, and most recently in the now discredited practice of *facilitated communication*. Facilitated communication (FC) is when a human helps an autistic person "communicate," usually by guiding the autistic person's finger across a keyboard. Autism is a devastating neurological disorder that affects the functioning of the brain, and results in mental retardation and the inability of the sufferer to communicate effectively.

In the late 1980s in Australia, Rosemary Crossley stumbled upon the idea that autistic kids really could communicate if only they were given a little assistance. She took autistic children's hands and guided them over a keyboard and helped type out answers to someone's questions. The technique, like all fads, soon found it's way to the United States and an "institute" was quickly founded.

At first it all seemed like a miracle! Parents of autistic children were deeply grateful because, suddenly poor Junior, who had been wheelchair bound and never able to speak a word in his life was able, through FC, to profess his love for mom and dad, and tell how his life was actually not so bad especially since he was surrounded by such loving parents. Everyone was happy.

But, as these things do, the fad started to unravel. Children, guided by FC were no longer content to profess their love and, in some bizarre desire to blame their autism on something or someone, began, through their facilitators, accusing their parents of molestation and other cruelties. This was during those times in the early 1990s when the "recovered memory" movement was at its unhappy peak, and, presumably, the social workers touting FC were feeling left out of the excitement and notoriety their more analytic friends were generating with all their talk of satanic rituals and other unspeakable horrors, and they wanted to get in on the fun. FC workers were up to the task as evidenced by the

fact that some people were arrested and jailed as a result of their facilitated accusations.

Some suspicious people began to wonder if the claims of FC had any real basis. They started to conduct tests. One brilliant test was to ask the child a question which the facilitator could not hear. In these circumstances the child could *never* answer the question. They then switched it around so only the facilitator could hear the question and the child could not. For those times the "child " was able to get the right answer.

The conclusion was obvious: the facilitator was the one doing the communication and *not* the child. It was the facilitator all along who was, knowingly or not, writing the messages.

This test, of course, has been repeated and each time the same conclusions are reached: FC doesn't work. Naturally, you're now thinking, this must have persuaded its practitioners to abandon the field.

Not hardly.

Like we discussed earlier, once people commit themselves to a belief they find it nearly impossible to abandon it. Luckily, the courts aren't looking with a friendly an eye at FC anymore, but many parents are still being duped into believing it works.

So back to the Ouija board. Tests like the ones I suggest have been conducted, all pointing to the fact that it's the people themselves moving the planchettes. Naturally, you would think this knowledge would cause people to abandon use of the board.

What's your guess?

CHAPTER 14

Final Final Word

skepticism: The cautious attitude of questioning and healthy doubt that should be the first reaction on hearing an extraordinary claim.

If you haven't guessed by now the main story of this book is that error is inevitable, that even in the most carefully and meticulously designed experiments, something can always go wrong. Murphy's Law is continuously in force during parapsychological experiments. You must always be cautious when scoring your own results or when examining someone else's experiments. Because errors do occur the proper attitude is to be skeptical of your results and of the claims of others. I hope you have developed a keen appreciation of how difficult experimentation can be, of how easily things can go awry, and of how simple it is to be misled.

Experimental error is not the only difficulty for parapsychology. A large problem is the lack of a coherent physical theory which explains paranormal phenomena. A sound parapsychological theory should describe how a person can read minds and predict when he would be able to do so. Although the theory does not yet exist, predictions about the paranormal are still being made, and these predictions can be tested.

To verify a prediction requires evidence. It's all very well to submit emotional anecdotes and invoke mysticism to argue for a belief in paranormal phenomena as most popular narratives of parapsychology and spiritualism do. Anyone can do this because it doesn't requires effort (on television, for example the anecdote is the only form of argument offered and, therefore probably the only one with which you are familiar. This skews your view of both psychic phenomena and of criticisms, a subject discussed below.). However, what is required is solid reproducible evidence that can generated by tests like those developed in this book.

1. Things That Can And Will Go Wrong

It is essential to maintain a questioning attitude when investigating experimental results. You must ask yourself a series of important questions. Was sensory leakage eliminated? Was the randomization done properly? Did the report include all the relevant data? What could have gone wrong?

With this list in mind, consider this list of key things that can go wrong with parapsychological experiments.

1.1. Improper Design. Inadequate or non-specific experimental goals are frequently problematic. Failing to insure the experiment is conducted in a double-blinded fashion (recall clinical trials and the placebo effect) is also a common flaw.

Many experiments are run in the vague hope that something weird will happen. This is a mistake: every experiment should clearly define the procedures to follow and lay out the precise definitions of success. In parapsychological experiments a 'hit' has to be specified in all its particulars and these stipulations cannot be deviated from, especially in post hoc examination of the data. For example, in the telepathy card guessing experiment in Chapter 3 the exact card has to be guessed—just getting the suite, or color, or value does not qualify as a hit. Finding that the card the receiver guessed was just before or just after the current one matched the guess of the current card isn't a hit either. The instructions must specify what a hit is and the researcher must stick to this definition, especially after the experiment is over when the temptation to look back in the data to find something surprising is strongest.

Don't forget about the Law of Unsurprising Surprises conjecture, which maintains that it's *always* possible to find something surprising in a set of experimental data. If this idea is kept firmly in mind it is possible to resist the urge to experiment for one effect and then claim to have really been experimenting for another. Mining the data for surprising effects is cheating.

A good test design ensures that the effect that the researcher is seeking can be distinguished from no effect. This simply means knowing how to apply the probability structure of the randomly generated data (like shuffled cards or dice throws) to generate a score . Some tests must go farther and compare the the effects of

a treatment (like a drug or magick spell) against a control group. Entirely different types of statistical measures are used for these experiments (measures which are beyond the scope of this book). Even if you are unsure of the mathematics of these measures you must be sure a study reports results on a control group and that the treatment did better than the control. If these comparisons are missing the experiment is suspicious.

Double-blinding is discussed shortly.

1.2. Bad Randomization. Bad randomization (of dice or cards, and so on) could be caused by incorrectly employing a randomization device, or by intentionally altering a guiding random sequence. The former problem is simple enough: bad coin flips and sloppy dice can easily bias an experiment. Once these problems are noticed they can be fixed easily .

To explain the latter potential problem assume a card guessing experiment in which employs a well-shuffled deck of cards. The resulting random sequence of cards is said to *guide* the experiment. Some researchers have been known to look at this random sequence and think, "It doesn't look random to me!" and then proceed to change the original sequence so that it "looks" random. However, it is well known that humans are terrible judges of randomness and any alterations in the guiding sequence will be detrimental (that is, changed toward non-randomness and towards concluding psi is present when it is not).

Bad randomization can also sneak in by the process of feedback. Recall that, for some types of experiments, feedback can dramatically alter the scoring table—and always in such a way that the number of hits received is less surprising than the same number reached without feedback. It's best to get into the habit of eliminating feedback even the experiment isn't thought to be affected.

Another problem, related to improper test design, is the effect being tested does not have the random structure that the researchers assume it does, thus invalidating the scoring table. Recall the example of stock price prediction. The stock prices moved in a correlated fashion, and this correlation dramatically changed the scoring table. In the seance test there was no scoring table per se, but an individual judged each of a medium's correct

statements by how surprising each statement seemed to him. It was shown that, while these statements might at first seem surprising, they are designed so that they have a high probability of being true. In other words, the fact that a medium repeatedly guesses correctly is not at all surprising—the random structure of the answers (the probability the statements are randomly true) is not prespecified by the experimental protocol (the probabilities may not even be known, or they may be impossible to quantify exactly).

1.3. Sensory Leakage. This is the biggest potential problem area for all parapsychological experiments, because if it can be shown that a subject *could have* performed an effect by normal means it is nearly impossible to prove that he performed the effect by extra-normal means. Remember that the goal of parapsychological experimentation is to prove that a subject learns information by extra-sensory means. The researcher must scrupulously eliminate all possibilities of normal sensory information transfer. This is never an easy task as you have learned.

Most people do not realize how much they learn from non verbal communication. This makes it difficult to think about removing its possibility. A great deal of information is conveyed in a stern look, a shrug of the shoulders, a rapid intake of breath, the tilt of the eyebrows, a stiff posture, and on and on. Any of these things could give a massive amount of information to the subject of a experiment (such as feedback in the telepathy test) and make it appear that psychic powers are operating when they are not. To be on the safe side, whenever possible, remove any opportunity for visual contact between the subjects of an experiment.

1.4. You. The It's Not My Fault (INMF) syndrome is ever ready to strike a the subjects of a parapsychological experiment. INMF is the sickness that sometimes effects people who fail a test (fail in the sense that they did not display psychic functioning). Look for this closely in your own experiments. Be ready for the syndrome to strike you and your friends after the completion of an unsuccessful test. No matter how carefully and diligently the experimental is carried out the excuse, "Something wasn't just right," will *always* be available. It never matters that the subject agreed that everything was fine before the experiment, if he fails

he will become amazingly creative in his excuses and will always discover flaws in the design that somehow masked his powers. No one *ever* wants to admit that they don't have psychic powers especially if he believed he had these abilities going into the test.

People are terrible witnesses and there probably isn't a worse witness than someone who looks at an event with a strong desire for certain outcome. This is known as the experimenter effect, and it's found in all areas of science, from astronomy to analytic chemistry, and most certainly in parapsychology.

An example of experimenter effect was given in Chapter 2 (biased meteorological observations). The point was, if professionally trained meteorologists, who certainly have no emotional stake in the temperature being plus or minus a few degrees one way or the other, can, unawares, bias their observations, imagine how easy it would be for an earnest parapsychological researcher, a person who possibly has an enormous emotional investment, and equally possibly has her career riding on positive results can, also unawares, bias her results. She might not bias her results intentionally (although it is true that some researchers cheat) but by being too sensitive to the hoped for result, by being too willing to dismiss any negative findings as the result of some "aberration", and by not being open to the idea that what she is testing for isn't there.

Experiments which should have but lack double-blinding are also troublesome (double-blinding is introduced in Chapter 2; not all experiments need double-blinding). This means that, for the appropriate experimental framework, the subjects must have no idea if they are in the treatment group or the control group. The experimenter also must not know how the subjects are divided, real or placebo. The acupuncture test suggested in Chapter 13 is a double-blind test. Double-blinding is essential because if the experimenter knows what he should be looking for he can unknowingly bias the results in that direction. If, for example, the subject knows that he is not in the treatment group the placebo effect might vanish. That's bad because if the treatment truly has no effect it may seem like it does because the attitude of the subjects in the treatment group might show a marked placebo effect while those subjects in the control group will show very little or no response.

1.5. Cheating. As mentioned in Chapter 1, cheating is a tremendous problem in parapsychology, because it stains the reputation of the field and creates a tremendous burden on the researcher to insure clean tests.

Suppose a researcher suspects or catches a subject cheating on a key bending experiment. Sometimes the researcher doesn't want to believe the subject cheats all the time, but thinks the subject cheats to make the researcher happy, or because the subject is under a lot of pressure. The researcher might not believe that the subject can actually bend keys using psychokinesis, but theorizes that the subject perhaps heat the metal slightly. The original experiment was designed to test for bent keys. The researcher who wants to believe that his subject still has genuine powers must manipulate the data to account for the cheating, or may (after the fact) change the stated goals of the experiment. Both of these tactics invalidate the entire experiment.

There are tens of thousands of ways to cheat at parapsychological experiments, and new systems are being invented all the time. Professional magicians invent and earn their living devising increasingly clever, devious, and diabolical (their favorite term) ways to cheat, that is, to make ordinary actions appear paranormal, to fool people into believing they have powers they do not. Most magicians "cheat" as a form of entertainment. Some rogue magicians occasionally try to pass themselves off as genuine psychics and it usually takes another magician to catch them. Some gullible researchers are occasionally fooled by these dishonest magicians, perhaps because the researchers are too willing to believe the phenomena they were witnessing were produced by extraordinary means.

Some of these dishonest magicians have been exposed by skeptics (which implies that some were not, or haven't yet been— it's difficult to be sure that all the cheaters have been weeded out). Other magicians exposed themselves, as it were, by being willing participants in parapsychological experiments because they wanted to show how easy it was to fool "professional" researchers. In his book *The Faith Healers*, James Randi recounts a hilarious epsiode wherein a magician friend decided to surreptitiously test a faith healer's powers. Randi and his friend, Don Henvick, were suspicious of the claims made by a certain spiritualistic healer, so

Henvick, who is quite large, donned a dress, wig, and makeup, assumed the name "Bernice Manicoff," then presented himself (herself?) to the healer who proceeded to diagnose and cure uterine cancer in Henvick.

Substituting magic tricks for genuine effects is only one way to cheat. A subtle and pernicious form of cheating is known as the *file drawer problem* or *the selective reporting problem.* This is when a researcher, through the best of intentions or otherwise, decides only to report the positive results of an experiment (this unfortunate practice is not limited to the field of parapsychology). Why is this bad? The obvious reason is that by ignoring the negative results the research community only gets half, or even less, of the story. Selective reporting unfairly skews the results in a positive direction. An everyday example of the file drawer problem is "gambling memory." Who doesn't know someone who swears that, although they have lost a little money at the casino or on the lottery, they are "ahead in the long run." If everyone who claimed to be ahead actually was the casinos and state lotteries would not exist. If you are one of these people, try keeping an *exact* journal of the amount you spend and win. Do it for at least a few months. This will be an eye-opening experience for you.

Let's step through a fictitious example of selective reporting and examine what the process does to a probability score. A parapsychological researcher submits a journal article and reports that, as a result of telepathy card guessing experiment (like the one outlined in Chapter 3), a subject, in two separate experiments, got 4 hits out of 52. This has a probability of 0.0002 (randomly, two times out of 10,000 trials) happening by chance alone. The result appears overwhelmingly significant! But what the researcher failed to mention was that the subject was part of a group of nineteen others (who did not score significant hits in any test) and that all subjects did the same test six times. The probability that out of 120 trials (20 subjects times 6 trials each) at least two results would have a score of 4 hits or greater is 0.094, or about 10%. This is quite a bit different than 0.0002 and is not convincing that telepathy exists. By selective reporting, this researcher has taken a rather mundane occurrence and transformed it into a highly significant event.

He may have justified doing this in several ways. Perhaps, *after the fact*, he decided to declare the first four trials "warm-ups" because no one really did that well. He decided only to count the last two trials because he felt, by then, everybody would be familiar with the experiment and would do their best. There is nothing wrong with doing this as long as *this decision was part of the original test protocol*. We can *never ever* look into the data after the fact and selectively pull out the significant events. This is a cardinal sin of statistics.

This researcher only reported on the one subject and not the rest. Perhaps he labeled her "promising" and felt he could justify this because he only wanted to concentrate on one person. Again, there is nothing wrong with this, as long as he had decided to do this *before the experiment was run and before any data had been taken*. This cannot be emphasized strongly enough: for every experiment the researcher must, in advance, decide what results will be examined and what *exactly* constitutes a significant result.

Maybe the promising subject started a couple of experiments, got half way through the deck without a hit, and decided to "start over" because she wasn't really ready. Can you guess why this is bad? If you were allowed to throw out the trails that were "bad" it would only be possible to report positive results! It would *always* appear that psi is real. Every result must be used to form the final result, and every experiment must be completed once started.

To avoid the file drawer problem, careful records of all results from each experiment must be kept. Let me state that again: *results for each and every experiment performed must be kept!*

2. Evidence & Explanations

2.1. Theories. All scientific theories have two main divisions: an explanatory section and an evidential section. A complete theory must have both parts. The explanatory piece is obvious: this is the section that describes what the mechanisms of the theory are, and how these mechanisms fit into what is known about the world as a whole. Explanations generate testable hypotheses, they make predictions. Successful predictions based on these hypotheses create the evidence for a theory. In the end it is the accuracy of the predictions a theory makes that account

for its acceptance or rejection. If a theory makes inaccurate or unmeasureable predictions the theory is abandoned or modified.

Science progresses from inevitable conflicts inherent with the arrival of new theories. When a new theory is proposed, sides are taken and arguments are advanced as to why it can't be true or how other mechanisms can explain the theory's data. The theory's supporters can rebut these charges with tighter arguments and better data, or, more frequently, by discovering that the detractors were correct. In any case, everyone learns something.

In the end, it doesn't matter how a theory states how something happens, what matters is that the predictions it makes can be verified. That is, the theory must be predictive but it does not necessarily have to be explanative (or, at least, the explanation does not have to be convincing). Thus, in judging a paranormal claim we must first ask that the claimant make a prediction (like "keys can be bent with mind power"). Once the claimant does this the prediction can be tested, even if we don't understand or accept the explanation for the prediction. If the prediction repeatedly fails we have every right to abandon the theory.

Unfortunately, it doesn't work that way in parapsychology. Too often people are seduced by the appeal of the explanatory piece of paranormal theories. The reasoning is: it *sounds* right, therefore it must *be* right. People allow themselves to be swayed by the degree and vividness of paranormal stories and how these stories so easily resonate with their world view that "the truth is out there." When the theory's predictions fail, as the have so far, its supporters are not deterred. The power of the explanation is too strong to abandon. It would be too hard to reconcile deserting the paranormal explanation with the remainder of their beliefs.

2.2. Television. It's not surprising that people accept or reject theories based on the allure of its explanations because this is typically the only contact they will have with a theory. It's unusual for someone to have access to predictions, the data produced as a result of formal tests (like those given in this book). If anything, they are assured that all predictions have verified, although they are never given any proof of this. Naturally, most contact people have with the paranormal is through television.

It seems impossible for the producers of television shows related to paranormal subjects to offer a skeptical, or even a remotely balanced, presentation for the events they depict. Instead of evidence they offer spooky music, dramatic "recreations," and alluring visual displays. Weeping women tell tales of how a spiritualist contacted dear old Aunt Edna (the medium "saw" the letter *E*); "gifted" performers grunt and groan as if severely constipated, and gesticulate wildly in efforts to psychically bend spoons; men in white lab coats certify that the latest bizarre feat could have *only* been brought about paranormally. And on and on. Whose fault is this the public doesn't get a balanced presentation? Yours. Yes, your and not their fault. The TV producers who create this schlock argue that they give viewers what they want. If more viewers wanted reasonable balance, that's what they would get. These producers are perfectly correct. If no one watched these programs they would quickly disappear from the air. The simple formula is: change the channel or turn it off.

3. Mechanisms of Psychic Phenomena

Mechanisms and explanations, biological or physical, that *must* exist if psychic phenomena are real are not discussed at length in this book. This lack of material on mechanisms reflects the actual state of paranormal research. That is, there has been relatively little research into what mechanisms are responsible for supposed psychic effects.

If psychic phenomena are real, then some sort of reactions in our physical-biological bodies must be occurring. For example, consider communication with the dead. Assume, if you already do not, that this is a real and valid phenomenon, that people can actually communicate with the spiritual beings of deceased people.

No one knows the exact biological mechanisms that allow spirit communication to occur. Perhaps the spiritual essences of the non-living, or ghosts, cause transverse waves in the atmosphere (sound) to propagate to the ears of psychic mediums. If so, these sound waves can be measured. Perhaps the ghosts tickle

neurons in the medium's brain, the resulting pattern of brain activity mimicking what happens when real sounds are heard. This neural activity can be measured too.

No matter which paranormal phenomenon is said to be operating there *must* come a moment when the ethereal meets the real and causes a direct measurable effect on the physical world. There is no escaping this fact. This is because changes in the physical world must take place when psychic phenomena manifest themselves. Physical conditions progress from one state to another (think about an unbent to bent key, or a medium's blank mind filling with a ghostly message). If this progression of states is instantaneous it can still be measured.

A tremendous and glaring defect in all parapsychological theories is that there are no known mechanisms, no biological agencies, or physical reactions, that are said to cause psychic phenomena. If these mechanisms are not found, the entire field of parapsychological research becomes suspect. This is because all reported psychic phenomena might have normal, and not paranormal, explanations. Reasons such as wishful thinking on the part of believers, misinterpretations of the data, and even cheating have, it is admitted, account for the majority of positive results reported so far. What of the remaining positive results? If no justifiable biological or physical theory of the paranormal is proposed and suitably defended these results must be accepted as having ordinary, but perhaps unknown, explanations as well.

It's not that physical mechanisms haven't been proposed—they have, but they have all been refuted. Some people are now trying to take refuge in the field of quantum mechanics. A brief section on the subject is included below. I'll note here that because a theory seems mysterious to some people it is not necessarily so to its practitioners (in this case, physicists). The mysteriousness and opacity of quantum mechanics cannot be blindly invoked in the mere hope it will turn out to be useful. We need more than hope. We need hard facts.

4. The Bizarreness of Quantum Mechanics

Many current explanations of paranormal events, New Age phenomena, and even modern day miraculous religious experiences have some basis in, or at some time or other have been blamed on, quantum mechanics (QM). This is because the popular perception of QM is one of mystery and obscurity. Something bizarre is happening on the subatomic level. Our thoughts can interact causally with the universe, a force that *connects* all living and non-living things. Time and space don't hold the same barriers to quantum events as they do for ordinary large scale events. QM is a wonderful and inexplicable curiosity which can explain the workings of the psychic mind.

These interpretations are usually advocated by people who have little or no understanding of the physics of QM. It is not enough to have read a *Discover* or *Time* magazine article summarizing a few tidbits of science and then develop a parapsychological quantum mechanical theory on the workings of human consciousness. QM is a difficult subject and one that requires *effort* to understand, interpret, and apply (to make predictions about the world). Nevertheless, it is possible to understand QM at some basic level.

First, QM is a misnomer, a bad name for a simple process. You should understand that, in physics, the term *mechanics* means movement, or the study of how things move. Only this and nothing more. Classical mechanics studies how, for example, baseballs curve, airplanes fly, and watermelons crush in falls, none of which are weird events. So we can modify the name to quantum movement, or the study of quantum movement. What about *quantum*? It means only one thing: *discrete*. So, instead of QM, we would do better with *discrete mechanics*, or even more banaly, the study of movement on a discrete scale. "But, dammit Briggs," you may be saying to yourself, "that doesn't sound so mysterious at all!" Amen, brother, amen. From now on, we will call the subject DM, for discrete mechanics.

Here is a small, and greatly simplified, attempt to take some of the mystery out of DM. This example will show that while things at the subatomic level are not deterministic they are not always especially bizarre.

Picture a simplified hydrogen atom consisting of a proton and an electron. The electron "circles" high above the proton with a certain speed and at a certain distance. Suppose, now, a beam of light strikes the electron, giving it some energy and causing it to move. It turns out that the electron can only move a fixed, discrete amount; or, it is said that the electron moves to a higher energy level because of the energy imparted to it from the photon. After a while, the electron may lose the energy it got and emit a photon. It will then fall back exactly to where it started. The exact amounts an electron can move are fixed by the laws of nature; however we know these levels well, and we know the mathematical models that explain how far each level is from the next.

Well, that's it. That's discrete, or quantum if you like to sound fancier, mechanics. Notice—pay close attention here–that the workings of the human mind did not enter in the description of electron's movement. Human perceptions, emotions or mysterious vibrations[1] had nothing to do with the location of the electron. The electron-photon interaction behaves in a certain prescribed manner that is neatly described by a set of equations. There is no mystery attached to it, though there are no shortage of people trying to extract as much spookiness as they can from it, particularly in parapsychological research.

If DM is to be used as an explanation for psychic phenomena it *must* to be accompanied with a biological-physical model. DM *cannot* be *invoked* like magic. A theory of how the brain interacts with matter in a quantum mechanical fashion must be given. For example, a model that says the brain generates M-rays[2] that are transported through the air to a thought of target. Once there, these M-rays interact in a certain specific and predictable manner with the target. The target will be composed of *matter*, and matter is understood to operate under the laws of physics. This theory must explain exactly what happens when the M-rays interact with the physical matter of the target. The theory must also describe how people generate these M-rays. How is the energy created? How does it find the exact target? How is it transformed from

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[1]It's always vibrations or waves, isn't it? Yet I'd bet that fewer than 1 in 10,000 of the people who throw these terms around have never seen, yet alone know, how to calculate an actual wave function.

[2]M is for mystery.

M-rays to ordinary (and measurable) energy? How does evolution fit in?

Physicists understand quantum mechanics very well. They can make predictions that are astoundingly accurate. If they could not, your I-PODs, cell phones, and televisions would not work. All of these devices operate under well understood quantum mechanical prinples. QM is *not* a mystery to physicists. It is a mystery to most of the public because it is a difficult subject that takes years of training to comprehend. Blind acceptance of quantum mechanical "explanations" of psychic events because they sound plausible or especially mysterious is wrong.

5. SKEPTICS

Skeptics focus on the possible deficits of parapsychological experiments. There is nothing wrong with being skeptical. Paranormal phenomena are often treated as if they must be *believed* wholesale and that these beliefs should not be questioned. People are asked to have faith that ESP exists. If you don't believe you are said to be closed minded. This is nonsense. Faith only has meaning in the context of religious beliefs and has nothing whatsoever to do with psi. Taking refuge in the idea that "there are just some things we don't understand" is a sign of intellectual laziness. It's true that there are phenomena that are not understood but these things can be tested and explored.

Paranormal belief is not a case of "Western" versus "Eastern" thinking. This false dichotomy is used as an excuse by those eager to believe in something for which there is no evidence. Either the paranormal can be proved using scientific methods or it cannot. Refusing to test because testing is "Western" pushes the paranormal into the realm of the religious.

Closed minded is a term that is frequently applied to skeptics. This description can, however, just as easily be applied to the supporters of the paranormal. It is usually the case that members of the public refuse to consider the skeptic's counter evidence, but some professional researchers are stubborn as well. What these die-hard psi supporters fail to realize is that they carry the burden of proof. They are making extraordinary claims about strange and

wonderful powers. Therefore, it is up to them to prove beyond a reasonable doubt that these powers are real.

A popular parapsychology theory explains that there are two kinds of people, the sheep and the goats. Sheep are psychically sensitive individuals who tend to score better than chance in parapsychological experiments. Goats are skeptical or insensitive people who have little or no psychic talent and therefore do not do well in these experiments. This theory is harmful because it is too tempting to dismiss any negative results as the work of the "goats." Unfortunately for some researchers, *no* amount of negative evidence is enough to convince them that the phenomena they are testing for doesn't exist. They are like anti-skeptics, believing in the face of doubt. Clearly, this is faith and not science.

The sheep-goat theory may have some validity, in that there may be differing levels of psychic ability in the population; however this theory cannot be invoked after the fact. After an experiment has concluded the data cannot be examined and used to separate the subjects by their scores and say "this group are sheep" and "that group is goats" (and then maybe just present results on the sheep). Why? Because probability theory guarantees that a significant effect will be found even if one is not there! That is, by chance alone, some people will do better than average and some people will do worse. If the researcher only reported on those who did better, and called them sheep, and then used his experiment to claim that the paranormal is real he would be making a mistake. This is because the probability of finding a group of sheep in a set of data by chance is close to 1^3, meaning it *will* happen, and is not the least bit convincing of paranormal abilities.

A variation of the sheep-goat theory declares that skeptics are not only goats but that they emit evil skeptical "rays" which can cause negative results in sheep. Well, this may be true, but there is no way to prove it isn't. It is a sad excuse for negative results because it can *always* be invoked. Any time a parapsychological researcher gets a negative result he can blame it on skeptic rays. This theory has no predictive power. Unless the researcher can predict in advance when evil rays will occur he will *never* be able

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[3]Assuming a large enough pool of subjects of course.

to reliably interpret his data. After all, skeptics are everywhere. How can the researcher be sure that they aren't sitting around in some skeptical circle chanting skeptical chants and casting skeptical charms wishing for negative results for their parapsychological colleagues[4].

You cannot disprove a negative. For example, suppose that I take an apple in my hand and drop it. It hits the floor. I say the reason it falls is because my psychic powers *caused* it to fall. You may scoff and say you think gravity had something to do with it. Well, gravity is meaningless to me, because obviously I caused the apple to fall by the power of my mind. You might then argue that I'm being silly, but you have no way—no way at all— to *conclusively prove* that I'm wrong. You can only appeal to the group of self-consistent laws of physics and mathematics on the strength that these laws have proved enormously useful in other areas. If I continue to refuse to change my mind and stick to my weird belief you have every right to say I am stubborn and just plain silly.

Many parapsychological researchers and ordinary people have a pet theory they love, a belief that perhaps gives them great comfort. These people may be too embarrassed to abandon their belief when confronted with contradictory evidence. So they invent more theory to place on top of the old theory as a patch. This is not necessarily bad, but the end result of repeatedly revising a hypothesis in order to hold on to a cherished belief produces unnecessarily complicated and ugly theories. Traditional scientists are guilty of this too—the latest example being cold fusion. Even after it was demonstrated that physics doesn't support their theories, a core group of cold fusionists still cling to the belief of "fusion in a jar" and invent ever more intricate and elaborate mechanisms to explain the lack of reproducible results.

Remember our rule: either a theory makes predictions which can be verified or it doesn't. Simple. If the theory works, it can be tested, proven, and applied. Some skeptics insist that testing original paranormal claims is worthless, but they are wrong. How else can we know if something works unless we first test it? This

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[4]Incidentally, skeptics, being skeptics, wouldn't even believe they have these powers so they wouldn't bother chanting in the first place.

is why I wrote this book, to allow you to test things for yourself. You will let the evidence decide whether you should accept a phenomenon or not.

Skeptics are wrong to insist we should not test original claims, but what about claims that have never been verified? There comes a point where a claim has been tested and tested and re-tested again. There is never a positive result, or there are always difficulties. In these cases it is natural to break off pursuit, to stop testing. A non-paranormal example of fruitless research is the search for perpetual motion machines (nowadays called zero-point energy machines). These elusive devices promise to either create more energy than they use, and run forever without wearing down. Many people, dreaming of immense riches and fame, have tried their hand at building such a device. Thousands upon thousands of experiments were conducted, all giving negative results. Eventually, it was conclusively proven—beyond all reasonable doubt—that such a machine is impossible. Before the U.S. Patent Office "modernized" they refused to test any perpetual motion machine, because they knew that the laws of physics said these devices are an impossibility. There came a point, naturally and rightly, when it was declared, "Enough is enough!" Society is not losing a thing by the Patent Office's refusal to test any more perpetual motion machines—their inspectors can better spend their time elsewhere.[5] The Patent Office has become a skeptic when it comes to perpetual motion.

You have to be prepared to ask yourself this: can you become a skeptic yourself? What if you perform a thousand tests for dowsing, with a thousand different very earnest people, and that none of the results ever turns up positive? You might have more people try the test. All these tests are negative too. What then? Will you modify your personal belief in dowsing and become skeptical that it really exists, or will you look for excuses as to why you might have previously failed?

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[5]Lately, the Patent Office has been acting screwy and granting patents to the strangest things, some even akin to perpetual motion machines (a.k.a. zero-point energy). One argument why this happens is that the Patent Office gets its funding based on the number of new patents it awards. More patents, more money. Perhaps new inventions are not as closely scrutinized as they used to be.

It's true that you can "never know for certain" that dowsing (or any other paranormal ability) doesn't work, but you *can* know beyond a *reasonable doubt.* Here's what reasonable doubt means:

> The level of certainty you must have to stop testing a paranormal claim. A real doubt, based upon reason and common sense after careful and impartial consideration of all the evidence, or lack of evidence, in a paranormal claim.
>
> Legally, proof beyond a reasonable doubt, therefore, is proof of such a convincing character that you would be willing to rely and act upon it without hesitation in the most important of your own affairs. However, it does not mean an absolute certainty (definition modified from the *'Lectric Law Library*).

It's important to understand that reasonable doubt does not mean absolute certainty because you can never know that a paranormal claim is certainly false. But you can come to a point where it makes sense to stop testing, and to stop believing the claim is true.

For years, the magician and MacArthur "genius" grant winner James Randi has carried with him a check[6], now valued at over one million dollars, to be given to *any one* who can successfully demonstrate that he or she has any of the paranormal powers listed in this book. He has had hundreds of people try for the prize but none have claimed it. He may have got this idea from the magician Houdini who carried a similar check with him and made the same offer. No one claimed Houdini's prize either (see Chapter 12).

Mr. Randi's challenge has now been institutionalized at the James Randi Educational Foundation (JREF). The foundation will immediately pay to anyone over one million dollars if they can pass tests similar to those listed in this book (but you should know that each test is unique and the protocol for any official test would be strict to eliminate the possibility of sensory leakage or cheating). The fact that no one has ever won this money should

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[6]Now not actually carried, but on trust with a reputable third party financial firm.

make us all a little skeptical of paranormal phenomena. There are some people who claim that the JREF refuses to test them, because JREF is "too scared" of losing their money. There are even stories that people have passed the tests but were refused the money. None of these claims has any basis in fact.

It's also very curious that some very high-profile paranormalists, celebrities who openly boast of great and wonderful powers, refuse to submit themselves to a test proctored by Mr. Randi. Some claim they have no time, others raise doubt that the offer is genuine even though the details of the offer are publicly available and that the money is held by a trusted financial entity (details can be found at the JREF website, listed in Chapter 15). Many more question Randi's motivations, as if casting dispersions on his character and questioning Randi's personal reasons for sustaining the challenge is a point of argument against their doing the test. Skeptics argue that the question of whether or not these prominent paranormalists do possess strange powers can be answered very simply if they put themselves to the test—a test that the paranormalist assists in designing. Because these people refuse the test a very strong argument can be made that they don't have the powers they claim.

I suggest that the reader visit the JREF website where several prior tests are chronicled. They are revealing with respect to how actual tests play out (and of the wonderfully bizarre excuses people generate after their failures—the INMF syndrome again).

6. LAST FINAL WORD

The key to learning is, as most popular accounts of parapsychology note, to *keep an open mind.* Let's agree with this, and let's agree strongly. But what does keeping an open mind mean? One thing: letting evidence modify your beliefs. This means you have to be willing to let the data, if positive or negative, change your mind. You must be willing to be persuaded that a certain power does or does not exist.

It means that, if you are a skeptic, and you have seen positive, reliable evidence—such that all possibility of cheating is removed—that a psychic phenomena is real, then you must believe it. Most skeptics fall into this camp: they are willing to be

persuaded, though they believe that, so far, there is not enough evidence to be so persuaded.

If you're a believer, having an open mind means this: that you *must* be willing to state, in advance of seeing an experiment, what evidence would persuade you that psychic phenomena does *not* exist. If you are not willing to believe that psychic phenomena does not exist, then you have a closed mind. If you insist, despite all evidence, that psychic phenomena *must* be true, your mind is truly closed.

How can you gather evidence, one way or the other? Read balanced sources (some are listed in the references) and try to fit in what you learn from them into a coherent logical whole. Don't fall prey to what is known as the *availability bias.* In this case it means accepting a paranormal explanation for an event because you cannot think of an alternative normal account. "Well how else can you explain the results? It *must* be psi." Just because you cannot offer an alternative explanation does *not* mean there isn't one. Sometimes you have to accept the fact that you might not be able to discover how something happened.

Adjust your beliefs based on evidence. Weaken or strengthen your belief as new data arise. The process should go both ways. For example, as you would use a positive test result to bolster your belief in psi, so should a negative result *reduce* your belief.

You must be willing to have your mind changed—this is what it means to have an open mind. If you find yourself dismissing negative evidence or if you invent excuses to explain the negative finding, you are closing your mind to a possible truth.

CHAPTER 15

References

> **book:** A device comprised of words arranged sequentially on pages bound together in a volume the purpose of which is to assist communication. Something that appears trivial to write but gives truth to the cliche that appearances are deceiving.

There are many resources on the subject of parapsychological testing. One difficulty is that many references are not orientated to popular audiences. There is an unending supply of popular books and web sites on the paranormal, of course. Almost all of these works concentrate on retelling anecdotes and do not give help in designing experiments. I may as well be blunt and say that this means, lots of fluff and little substance. Avoid material that uses phrases like "find your creative and psychic center" or, "unlocking the power within" etc. What follows are sources that I found to be the most useful.

1. Web Sites

No modern book with references can be complete without a list of web sites. The difficulty, of course, is that this information is bound to be out of date by the time you read this. To lessen to chance of this, only a few of the larger sources are given. But remember that "Google is your friend." You can always search for some of the key words below to find more sites.

- Skeptic Society:
  WWW.SKEPTIC.COM. A very nice site with links and articles from their journal *The Skeptic*. There's also access to lots of books (most of the ones listed here) and a great tape series, lectures on various paranormal activities given at CalTech.

- CSICOP:

    WWW.CSICOP.ORG. More books and articles. You can also order t-shirts here. Some recent articles on testing the file drawer effect.
- The Parapsychology Association:

    WWW.PARAPSYCH.ORG. A well-organized site that has many of scholarly and popular articles. They also have a good links section to other parapsychological organizations and sites. No t-shirts but they do have some books and videos available.
- James Randi Educational Foundation:

    WWW.RANDI.ORG. Most of Randi's books can be found here (or at any on-line book store), but you can also get a great video called *Secret of the Psychics* which was originally broadcast as a NOVA special on PBS.
- The Skeptic's Dictionary

    SKEPDIC.COM. A wonderful site and great all around reference. Go there to read more in depth explanations of various psychic phenomena. Also some good stuff on strange "science" (UFOs and the like).
- Cold-reading article

    DENISDUTTON.COM/COLD_READING.HTM. One of dozens of sites that explain cold reading. This one is particularly well written and has an extensive bibliography.
- Cold-reading Wiki

    EN.WIKIPEDIA.ORG/WIKI/COLD_READING. I hesistate to reference the Wikipedia for much, mainly because of the possibly of error, but this entry on cold reading is not too bad.
- Cold Reading Generator:

    TOMSHIRO.ORG/COLDREAD/SAMPLE.HTML. I worry this site won't last, but it has software that you can use to randomly generate cold-readings for you! Yes! Astrological and spiritual. Here's a small one I just generated:

    > Many times, the Angels are following your every move. You live your life in blissful ignorance of the Kingdoms and Principalities of the Air. The power of the Dreaming World pervades your life. Better get

out more. You need to meet some people. The spirits speak to you in your dreams. But take it with a grain of salt or two. Better stop dreaming about that Perfect Person and get on out to meet some people. Perhaps you would be happier if you spent a little more time in the daylight. Good thing you can sense things coming. Otherwise you would be slimed a lot more. You may be mysteriously tuned to the Nether Worlds. Or perhaps you just have trouble not tripping over the wastebasket.

This is a great tool that you can use in the astrology test (where you use the same reading for every person but tell each that it was individually drawn up for them). If this site disappears try searching for "astrological readings" or words to that effect. You can easily print out a full reading and use it for the test.

- Psychic tests

    WMBRIGGS.COM. This is my own web site, where I have a few on-line psychic tests. I'd like to put more of these up, but it's difficult to invent a test where it *can* be done over the web. Still, there's a fun one here about card guessing. Give it a try.

- Stopolygraph: Learn the facts about polygraphs (lie detectors) at

    WWW.STOPOLYGRAPH.COM. A collection of sites and articles about the absurdity of using lie detectors.

- The 'Lectric Law site: at

    WWW.LECTLAW.COM. Cute site with short snappy legal definitions and links to major law sites. Read fuller descriptions of *hearsay* and *reasonable doubt* here.

2. BOOKS

I admit to being a book lover and cannot stop myself from buying each and every book on a subject which interests me (when I can find the money). Therefore, it is difficult not to list every

book I know about. But I tried to be careful and am only including the best of the bunch.

- *Charles Honorton and the Impoverished state of Skepticism: Essays on a Parapsychological Pioneer*, edited by K.R. Rao. I want to recommend this book to you, but it's very expensive and hard to find. Charles Honorton was a pioneer in the field of parapsychology and it was he who developed the ganzfeld experiments.
- *Test Your Psychic Powers* by Susan Blackmore and Adam Hart-Davis. A nice book with a different emphasis than this one but well worth reading.
- *Dying to Live: Near Death Experiences* by Susan Blackmore. A truly outstanding book on the subject. If you have any interest in this subject at all rush to your bookstore today. She also wrote, and you should also buy, *In Search of the Light: Adventures of a Parapsychologist.*
- *The Cartoon Guide to Statistics* by Larry Gonick and Woolcott Smith. Go ahead and laugh, but you'll be hard pressed to find a better introductory probability and statistics book written so that just about anybody can understand the basics.
- *Flim Flam!*, *The Faith Healers*, *The Mask of Nostradamus*, and *The Truth About Uri Geller*, all by James Randi. In these books Randi shows all that can and has gone wrong with parapsychological testing, from outright scams to sloppy experiments. These books are a must read.
- *Parapsychology: The Controversial Science* by Richard S. Brou-ghton. A very influential book in the parapsychological community with some interesting thoughts on skeptics.
- *Eyewitness Testimony* by Elizabeth Loftus. A beautiful book that should be read by everyone interested in how fallible memory truly is. Although it does not specifically mention parapsychological research, this book is crucial to understand how badly people remember things.
- *How We Know What Isn't So* by Thomas Gilovich. You can view this as a companion book to Loftus'. Gilovich brilliantly explains how easily we become biased in our

thinking. He even gives some examples in parapsychology.

- *King of the Cold Readers* by Herb Dewey. I'm listing this book for completeness but chances are you won't find it unless you know a magician or a magic store. You can search but be careful, the term cold reading is also used by actors to describe the first time they read a script.
- *The Psychic Mafia* by M. Lamar Keene. The book is only a little dated, but it's readily available. Fascinating story on how to cheat at psychic readings.
- *The Hippopotamus* by Steven Fry. This is a very rare book: a work of fiction in which things that are not what they seem turn out to be not as they seem but not as you think they aren't seen. Confused? Good. Go and read the book.
- *The Rumpole Books* by John Mortimer. These have absolutely nothing to do with the paranormal (although the story "Rumpole and the Children of the Devil," found in *Rumpole on Trial* is not to be missed), but I just can't resist a plug for my all time favorite author. Read Rumpole (and for that matter, read the Jeeves and Wooster series by Wodehouse) and also try to get hold of other Mortimer books like *Paradise Postponed* and *Titmus Regained*.
- The book *Probability Theory: The Logic of Science* by E.T. Jaynes. A gorgeous book on modern probability and statistics. See especially his Chapter 5, "Queer uses for Probability Theory."
- *The Odd Quantum* by Sam B. Treiman. This may be the best semi-technical introduction of quantum (read: discrete) mechanics available. Treiman takes you step by step using very simple math to show you the discrete nature of the universe. I highly recommend this book.
- *The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics* by Roger Penrose Another brilliant, wonderful book. This one has the best explanation of quantum measurement that I have ever seen. There's some math in the book, but all of it can be skipped. Before you start talking about mysterious vibrations and

"other" planes that are influenced by our minds, read this book. Then we'll talk.

3. Magazines And Journals

- *Journal of the American Society for Psychical Research*, hard to find except at college and university libraries. It's also a research journal and articles are not really intended for the lay person. This and the next journal seem to spend more time reviewing books then in printing original research.
- *International Journal of Parapsychology*, scholarly and also hard to find.
- *The Skeptic*, a quarterly put out by the Skeptic Society. An even tempered and very fair journal. Available at most newsstands.
- *Skeptical Inquirer*, a monthly put out by CSICOP. Not as thorough as *The Skeptic* but very accessible containing regular columns by Martin Gardner which are must reading for everyone. Also available at newsstands.
- *Chance*, which is partly sponsored by the American Association of Statisticians might be interesting to those of you dying to know about statistics and every day life. I list it because it can be found on newsstands (sometimes), but I have always found it's never quite as good as I want it to be.

4. Notable Articles

Some of these articles will be difficult to find because they appeared in scholarly journals. Still, if you live in a big city or have access to a library that participates in inter-library loans you may have some success. Some of the papers from *Skeptical Inquirer* can be found on-line.

- Deconstructing The Dead: Cross Over One Last Time To Expose Medium John Edward, 2001, by Michael Shermer. Article exposes Edward's cold reading trickery. Edward's technique is appallingly bad, a true embarrassment to magicians everywhere. For example, here's a quote from one reading given to a studio audience: "I'm

getting a George over here. I don't know what this means. George could be someone who passed over, he could be someone here, he could be someone that you know..." How many American's don't know at least one George? Edward's show is so heavily edited that he appears genuine to the public, but to an observer who has the opportunity to watch him in the raw, his fakery is obvious.

This paper is on-line at WWW.SKEPTIC.COM. This link is only general: you'll have to do a keyword search once you get to the page. The site does not provide a static link to the article.

- Eyewitness Testimony and the Paranormal, 1995, by Richard Wiseman, Matthew Smith, and Jeff Wisman. In *Skeptical Inquirer*, November/December 1995. A summary of work showing how bad people's memories are when it comes to accurately recalling paranormal phenomena. On-line at

  WWW.CSICOP.ORG/SI/9511/EYEWITNESS.HTML.

- Methods for studying coincidences, 1989, by Persi Diaconis and Frederick Mosteller. In the *Journal of the American Statistical Association*, volume 84, pages 853 to 861. This nice paper presents a foundation for the formal probabilistic study of coincidences (one that has not yet been started, as far as I know). The authors show events can be misperceived as coincidences. Diaconis is also the author, with Ronald Grahm, of many papers in probability and statistics, particularly the one about feedback in card-guessing experiments called "The Analysis of Sequential Experiments with Feedback to Subjects." This paper is found in the *Annals of Statistics*, volume 9, pages 3-23. Also see his "Statistical Problems in ESP Research" in *Science* from July 14, 1978, volume 201(4351), pages 131-136.

- A Close Look at Therapeutic Touch, 1998, by Linda Rosa, Emily Rosa, Larry Sarner, Stephen Barrett. In the *Journal of the American Medical Association*, volume 279, starting page 1005. It's on-line but you have to be a registered JAMA member to get access. Other papers on therapeutic touch frequently appear. Try a

keyword search at the JAMA site. This is the wonderful paper that describes Emily Rosa's therapeutic touch experiment. The abstract is freely available by searching the main web site.

- Coincidences: Remarkable or Random?, 1998, by Bruce Martin. In *Skeptical Inquirer*, September/October 1998. Examples of how some coincidences aren't especially surprising. On-line at
  WWW.CSICOP.ORG/SI/9809/COINCIDENCE.HTML.

- Quantum Quackery, 1997, by Victor Stenger. In *Skeptical Inquirer*, Januray/February 1997. Stenger is a physicist and does a much better job than I do at explaining why quantum mechanical "explanations" of psychic phenomena are silly. On-line at
  WWW.CSICOP.ORG/SI/9701/QUANTUM-QUACKERY.HTML

- The shrinking file drawer, by Douglas Stokes, 2001. In *Skeptical Inquirer*, May/June 2001. Interesting simulation that creates even more doubt about the famous ganzfeld "successes."

  Recall that the "file drawer" problem is that caused by researchers (paranormal or otherwise) who only publish results which are positive, that is, that fall in line with what the researcher wants to be true. This happens a lot in paranormal research, but it also happens a lot in ordinary research, particularly in medicine.

5. YOUR NOTEBOOK

Don't forget that, after all these experiments, your notebook is a valuable resource. Be sure to record *every* attempt that you make, every miss and every false start, and every success too. You want to avoid the problem of Gambler's Memory. That's when a gambler only remembers his wins and never recalls, or minimizes, his losses.

The same thing can happen to you too. You'll remember the successes, but begin to forget about the failures. You'll never make an accurate count of all the losses you

had without this notebook. You may think you will, but you won't.

Especially recount your failures when you are showing other people your results. Do no emphasize your successes! Try to give an even and balanced account of all your experiments. It's true the successes are more vivid and exciting, but you can't use this fact to read more into them than is really there.

6. Your common sense

Try to maintain a sense of humor about these tests and try not to go too crazy.

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About Your Author

Your author has a Ph.D. in mathematical statistics from Cornell Unviersity, and is currently an assistant professor at Cornell in the Medical School, in the Department of Medicine. He has long been interested in the math, philosophy, and statistics of how well people make predictions, and has published many scholarly (usually a code word for dull) papers in this area. Of course, people make predictions (guesses) when they engage in parapsychological experiments, so his work has a lot of overlap in ESP research. Statisticians have long been interested in this field: the work may have began with R.A. Fisher, one of the founders of statistics, who published a paper, in 1928, on how to account for skill in telepathy card-guessing experiments. Your author has continued this kind of work, and he has actively participated in designing and analyzing formal paranormal experiments. His web site, where more about this particularly fascinating individual may be found, is WMBRIGGS.COM, which includes some on-line psychic tests!