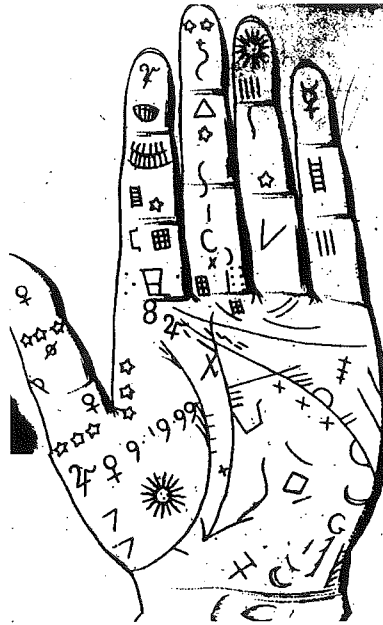


Syllabus for Thinking



Psy 330 Winter 1998

Please keep and read this syllabus carefully. You are responsible for everything in this document. In addition to the course calendar, examination dates, assignments, and due dates this syllabus also contains:

- 1) Information about how you will be graded
- 2) An explanation of the course requirements
- 3) A list of the pointers and themes you should know to pass this course
- 4) The framework [set of questions] you must use for each of the four required exercises
- 5) Two sample analyses to illustrate how to use this framework
- 6) The case descriptions for the four required exercises
- 7) Problems to ponder

1. Goals

The major goal is to improve your thinking skills. We do not aspire to teach you how to think. You already can think. Instead, we try to teach you how to use your thinking more effectively. We do this by 1) informing you about what psychologists have learned about thinking--how it succeeds and how it fails; 2) we acquaint you with techniques based on this knowledge; 3) we provide you with a framework for systematically evaluating claims that you encounter in your daily life; 4) we illustrate the application of this framework to several case histories; and 5) we assign four cases for you to write up as exercises using the framework.

Although we intend the framework to apply to almost any type of claim, we focus mostly on claims of the paranormal. In previous occurrences of this course, some students have objected to this emphasis upon paranormal claims. Some have objected because they believe in one or more paranormal systems. Other have complained that paranormal issues are not as important as other controversial topics such as the environment, abortion, aids, homelessness, racism, etc.

Paranormal claims provide good examples because the issues are sufficiently clear that they enable us to focus on learning the framework. Once you have mastered the framework, you will be better able to cope with the more complex social and environmental matters. In addition, it just is not true that the paranormal claims are less important than other claims. Surveys consistently show that a majority of our population--including the college educated--believes in one or more of the paranormal systems. Many respondents believe that they have had one or more paranormal experiences. This is important because if even one paranormal claim were true it would contradict the laws of science.

We live in an age of unprecedented scientific progress and technological achievements. Yet a majority of our population believes in systems that contradict the very foundations of this scientific and technological age. Surely this raises important questions. Is science fatally flawed or is most of our population--including the college-trained--badly deluded?

2.0 Class Meetings

The lectures are an essential component of the course. The lectures deal with cases and applications of the framework that you will not find in the textbook. My records show that those students who fail to attend lectures regularly get much lower grades than those who do attend. Just about all the students who have failed in this course were ones who rarely appeared in class. If you cannot attend classes regularly, do yourself and me a favor by not enrolling. The class meetings are from 9:30 a.m. to 10:50 a.m., *Tuesday and Thursday, in 110 Fenton Hall.*

3.0 Instructors

Instructor: Ray Hyman
323 Straub, 346-4910, rayhym@oregon
Office Hours: M 2:00-3:30 pm, F 2:30-3:30 pm

TA: Mike Stiso

4.0 Text

Halpern, D.F. (1996, Third Edition). *Thought and Knowledge: an Introduction to Critical Thinking*. Hillsdale, NJ: Lawrence Erlbaum.

5.0 Requirements

Examinations: Both the Midterm [February 5, 1998] and the Final Examination [Thursday, March 19, 1998 @ 1:00 p.m.] will consist of multiple choice items. Approximately half the items will be based on the text and the remainder on the lectures and exercises. The Midterm will contain 50 multiple choice items and the final will contain 100 items. Because of the class size, *no makeup examinations will be given*. Please check your calendar now to make sure that you can be present for the examinations. If it turns out that you cannot be present for one or more of the examinations because you have to attend Aunt Tillie's third wedding or because you have to be in Oshkosh to participate in the annual frisbee championships, please reconsider taking this course. We do not have the resources to make special arrangements for such cases.

Exercises: The exercises consist of four short papers. The first three papers should be two to four pages in length. The last paper should be five to six pages long. Each paper will deal with an assigned example that you will evaluate according to the framework given at the end of this syllabus.

IMPORTANT!

The exercises make up the heart of the course. Although they can contribute a maximum of 25% to the total number of points in this course, *you cannot pass the course unless you complete all four exercises on time*. The goal of the course is to provide you training in systematically thinking about issues and problems. You cannot benefit from the course without doing the exercises on time. You cannot get an incomplete for failure to complete one or more of the exercises. Not completing the exercises shows that you did not complete the course requirements and have failed the course.

Research Participation: The Psychology Department requires students in this course to serve as subjects psychology experiments. However, if you complete your four exercises you do not have to meet this research requirement. Instead, those of you who do complete your research participation can use it to bring your lowest grade on the first three

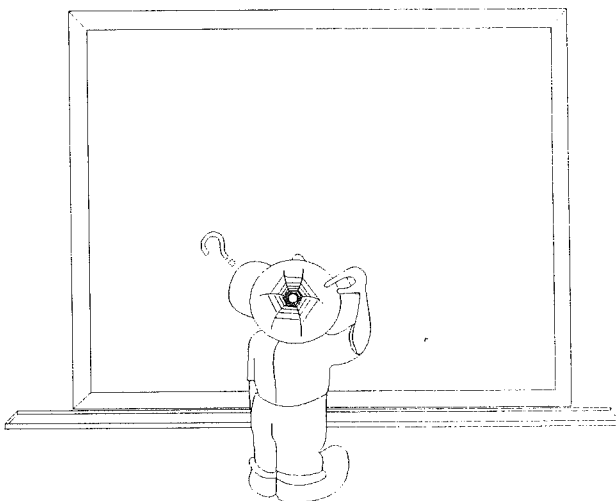
exercises up to the maximum 10 points. To qualify for such a bonus you must submit your slips for experimental participation along with a one-page summary of your experiences in the experiments [the one page summary covers your three hours of participation].

6. Grading

You can achieve a total of 200 points in the course. Your grade will be based on the total number of points you earn from the examinations and the exercises. In addition bonus points can be given for research participation and for marked improvement from midterm to final examination performance. To pass the course you need to *both* complete the four exercises on time and achieve a total of at least 100 points. You can earn your points in the following ways:

Exercises: You can earn up to 50 points for the set of four exercises. Each of the first three exercises is worth up to 10 points each. [If you complete the research participation, we will increase the lowest score you got on one of these exercises up to the maximum of 10 points.]¹ The fourth exercise is worth up to 20 points. *Remember that you must complete the four exercises by their due dates to pass this course.*

Examinations: The midterm is worth up to 50 points [one point for each correct answer]. The final examination is worth up to 100 points. In special cases where your final examination score shows marked improvement over an unsatisfactory midterm score, we will ignore the midterm score and pro-rate your total score based on your final examination.



¹ You can also earn bonus points on exercises by applying tools in the textbook in addition to the conditional format and the framework that is required.

Course Calendar and Assignments

Dates	Topics	Assignment	Pointers	Themes
Jan 6,8	The Framework/ Critical Thinking, Intelligence Language & thought	Begin Exercise 1 Ch 1,3	<i>Key Bending</i> , Geller, Dowsing <i>The Psychic Reading</i> SQ3R/ Graphic Organizers/ Communication Rules/	<i>Conditional Reasoning/ As-reported: as-happened/ Garbage-in: Garbage-out/ Falsifiability/ Metacognition/ Surface structure/ Meaning/ Framing/ Inference, Ideomotor Action</i>
Jan 13, 15	Reasoning, Logic, Rationality	Ch 4	Mulholland/ <i>Sherlock Holmes/ Doyle & Houdini/ Wason 4 Card Problem/ Circle Diagrams,</i>	Deduction-induction/ Observation/ Belief Bias/ Content Effects/ Illicit Conversions/ Confirmation Bias/
Jan 20,22	Analyzing Arguments	<i>Exercise 1 due on Jan 20</i> Begin Exercise 2 Ch 5	<i>Hasted et al/ Alternative Healing</i>	Retrospective Falsification/ <i>Illusory Correlation/ Credibility/ Fallacies/Diagraming</i>
Jan 27, 29	Hypothesis Testing/	Ch 6	<i>Zöllner & Slade/ Thinking as an intuitive scientist</i>	<i>Data & Resource Limits/ Symbiosis/ Causal Models/ Incrementalism/ Independent & Dependent Variables/ Correlation and Cause/ Placebo/ Illusory Correlation/ Reliability/ Validity/ Self-fulfilling Prophecies/ Double-Blind/</i>
Feb 3 Feb 5	Review M I D T E R M EXAMINATION	<i>Bring <u>sharpened</u> #2 pencils!</i>		
Feb 10,12	Probability/ Statistics & Psychics	<i>Exercise 2 due on Feb 10</i> Begin Exercise 3 Ch 7	Gambling Birthday problem Linda/	Overconfidence Conjunction Error Gambler's Fallacy Regression toward the mean

Feb 17,19	Decision Making, Pathological Science	Ch 8	<i>Pitldown Man/</i> Mental Paper Folding/	Contributions (O,E)/ Constraints/ Paleontological Model/ Schema/ Availability/ Representativeness/ Entrapment/ Psychological Reactance/ Liking/ Cognitive Dissonance/ Hindsight
Feb 24,26	Problem Solving	<i>Exercise 3 due on Feb 24</i> Begin Exercise 4 Ch 9	Parallelogram/ Monk/ Radius Problem/ Tower of Hanoi/ Two- string Problem/ Nine- dot Problem/ Monty Hall/ Two-coin problem, Beagles, and other problems from the syllabus	<i>Representation/</i> Heuristics/ Effortless-Effortful Retrieval/ Insight/ Incubation/ Well- defined & Ill-defined problems/ Diagraming & Representation/ Functional Fixedness/ Mental Set
Dates	Topics	Assignment	Pointers	Themes
Mar 3,5	Clever Hans Creative & Critical Thinking/ Leverrier	Ch 10	<i>Clever Hans/</i> Lady/ Wife & Mother-in- Law/	Brainstorming/ Checklists/ Redefining/ Strategies
Mar 10,12	The final word	<i>Exercise 4 due on Mar 10</i>	Leverrier	Redefining the Problem/ Beyond the Framework/ <i>Information</i> <i>Pollution/</i> Alternatives
Mar 19	FINAL EXAMINATION	1:00 to 3:00 p.m.	Please be on time!	BRING NO. 2 PENCILS!



INSTRUCTIONS FOR DOING THE EXERCISES

Evaluate the cases for your report by answering each of the following questions. Repeat the questions in your report so that we know which answers go with each question. Keep in mind that no general set of questions applies exactly to every situation. Some modifications may be necessary depending upon the context. Also, remember that your goals may differ from those of the narrator. *Use these eight questions as the framework for doing the four exercises. Remember to number and repeat each question in your reports.* Also, remember to rephrase the claim in *the conditional format*.

1. What is the issue or question?

"The issue is a question which specifies the controversy and makes clear why the argument even takes place."² For our purposes, no actual controversy is necessary. An issue exists whenever we want to critically evaluate a claim, happening, performance, system or anything else. The issue should always be stated as question whose answer we are interested in. Many issues can be raised about claims or happenings we encounter. Try to identify one that seems to matter or is most dominant.

In this course we will treat each claim as a *theoretical hypothesis*[H]. We will assume that each claim implies an *explanatory system*[ES] of some sort. The explanatory system, itself, is neither true nor false. A *theoretical hypothesis*, for our purposes, is an assertion or claim that some natural system in the real world is an example or realization of the explanatory system..

2. What is the claim [what is the proponent arguing for]?

The first step in thinking about an issue is to identify the claim or problem. Sometimes the claim is explicit. Other times the claim is implicit and you will have to supply it in your analysis. Often both explicit and implied claims are involved. You will also have to decide whether you are dealing with a specific claim about one concrete instance or a general claim involving an entire system. The claim is essentially an answer to the question raised by the issue.

We ask you to phrase the claim in an *IF...THEN or conditional format*. The portion that follows the *IF* is called the antecedent and corresponds to the theoretical hypothesis that is in question. The portion that follows the *THEN* is called the consequent. In this course, we will treat the consequent as the outcome of a specific test of the theoretical hypothesis. See below for more extensive discussion of the conditional format. We will also discuss and illustrate the conditional format in the early lectures.

² Moore, K.D. (1986). *Inductive arguments: a field guide*. Dubuque, IA: Kenall Hunt.

The components of the conditional format consist of the following:

- ES: the *Explanatory System*. The Explanatory System is simply a description or story about a system that can produce certain outcomes. In our framework, an *ES* is neither true nor false.
- H: the *Theoretical Hypothesis* is the claim that that the *ES* is true, i.e., that it applies to some system in the real world. In applying our framework we use *The Principle of Charity* and pretend that the evidence put forth to back a claim was gathered as a test of the Theoretical Hypothesis. In a true test, the observer begins with a statement of the Theoretical Hypothesis and derives observable consequences that should occur if the hypothesis is, in fact, true.
- IC: the *Initial Conditions* refer to the state of some system, person, or object prior to being subjected to conditions that, given the hypothesis, should bring about a specified change in the initial conditions.
- AC: the *Auxiliary Conditions* consist of those conditions that are explicitly or implicitly assumed to be necessary for the claimed outcome to occur. Newton's laws of motion, for example, assume that objects are moving in a vacuum. A feather and a bowling ball dropped from the same height at the same time will, according to Newton's theory, hit the ground at the same time. This will be true, however, only if the test is carried out in a vacuum. If the test is carried out under everyday conditions, the feather will take longer to reach the ground because of the resistance of the atmosphere. As we will discuss in the lectures, auxiliary conditions can be a legitimate part of a claim only if they are articulated before the outcome of a test. Too often, they are brought up after the test as a way to excuse apparent failures.
- P: the *Predicted Outcome* is the outcome of the test if the claim is true. We can conceive of the Predicted Outcome as the new state or condition of the system that results if the hypothesis being tested is, in fact, true. For example, many Explanatory Systems are descriptions of systems where certain rituals bring about a cure of some sort. For example, some explanatory systems describe a scenario in which the use of a certain type of crystal can heal a headache. To test the hypothesis that this *ES* is true, we would want to start with individuals who have a headache (*IC*) and, after applying the crystal therapy (applying it correctly would be an *AC*), we would look for changes from this initial condition such that the individuals no longer have headaches (*P*). This is why specifying the Initial Conditions is important. If the individuals did not have headaches to begin with, the fact that they do not have headaches after the treatment is meaningless. Surprisingly, many claims of miracle cures lack explicit evidence of the Initial Conditions.

The Conditional Format: Once you have carefully spelled out the contents of each component of the claim, these components are put together to make the claim in the following format:

IF (H & IC & AC) THEN P.

3. What reasons are offered to support the claim?

Is evidence cited to support the claim? What sort of support is offered? Hearsay, testimonials, anecdotes, experimental results, analogies, etc. In the conditional format, the evidence usually is what follows after *THEN*. The evidence is contained within the consequent. [If you have set up the claim correctly in the conditional format, the evidence corresponds to *P*.]

The *Principle of Charity* results in our leaning over backwards here to give the claimant every benefit of the doubt. We are *pretending* that the claimant actually designed a test *in advance of collecting the relevant data*. If the claim had been specified according to our format under question #2, it should have been set out before making any observation relevant to the outcome. Once the test has been completely specified, then we observe the outcome which can correspond to *P*--a successful outcome as predicted, or to *not-P*--an unsuccessful outcome. For the purposes of our critical evaluation of the claim, we are pretending that the claimant would have reported the outcome of the test regardless of whether it was successful or unsuccessful.

In reality, in almost all cases we are being told about the outcome just because it came out successful. The claimant is typically not reporting the outcome of an unbiased test, but rather is selecting, after the fact, examples that support his or her claim. We are hearing about a particular outcome just because it supports the teller's claim.

4. How strong is the support?

Here you try to evaluate the support. Is it relevant? Is it trustworthy? The strength of the argument supporting the claim depends upon 1) the relevance of the consequent or evidence to the theoretical hypothesis and 2) the quality of the evidence. Some sorts of evidence such as testimonials are untrustworthy whereas evidence collected under double-blind, controlled conditions is of high quality. A very important consideration, as we will see, is how likely the outcome is even if the hypothesis is false. To the degree that the evidence is consistent with possible theories other than the one being tested, it provides little support for the hypothesis being tested.

One important alternative to the results being due to the truth of the explanatory system, is the possibility of a given outcome occurring just by chance. Most outcomes that we will hearing about can occur for many reasons. Suppose the hypothesis is that crystal healing works and the predicted outcome is that crystal therapy can cure headaches. The crystal healer applies her therapy to an individual with a headache and he reports that he no longer has the headache. This would be inadequate as evidence for many reasons. One obvious reason is that we are dealing with just one case. And headaches come and go even with no intervention of any kind. This particular outcome simply could be the result of chance. At the very least, we would want to examine the outcomes from several cases.

5. What would be adequate support?

What kinds of arguments and evidence would adequately support the claim? How could you find or get such support? Hopefully you will learn why good evidence must meet criteria such as operational definition, controlled conditions, double-blind, etc.

6. What reasons might create (false) beliefs in the claim by the proponent and followers?

For a psychologist, this is the most important question. It focuses on how people can believe what isn't so. As you read the text and listen to the lectures, try to generate a master checklist of the various biases, fallacies, and other factors that can trick us into believing false claims.³

7. What did you notice or learn while doing this exercise that can be useful in dealing with the sort of problems that you face in your daily life?

This question is included to enhance the possibilities of transferring what you learn in this course to issues and problems you encounter outside the classroom. The idea is that if you consciously attend to ways of using this framework and the results of your exercises in other domains what you learn in this course will be much more useful to you.

8. What thoughts or actions on your part, while doing this exercise, were most helpful? What was not so helpful?

This question deals with *metacognition*. It is designed to get you to monitor your thought processes as you perform the exercises. If you make such self-monitoring of your thought processes habitual then you are more likely to find out what works and what does not work for you when you apply your thinking to new problems.

9. Application of an additional tool.

As already mentioned, you can earn bonus points by applying one of the other tools mentioned in the text. If you intend to try to get bonus points in this manner, you might find it useful to check first with me or Mike Stiso to make sure you are doing what we have in mind.

GRADING THE EXERCISES

As mentioned, the first three exercises are worth up to 10 points each and the fourth exercise is worth up to 20 points. The assignment of points for the first three exercises is as follows: Question 1: *1 point*; Question 2: *2 points*; Question 3: *1 point*; Questions 4 and 5: *3*

³ Here is another means for getting extra credit or adding points to your grade on an exercise. Submit your checklist along with your final exercise. If we deem it a good one, we will add a few points to your total.

points; Question 6: 2 points; Questions 7 and 8: 1 point. In addition you can gain up to 2 extra bonus points for Question 9.

SAMPLE CASE #1

We present two cases for analysis by the framework. Each case is followed by a possible analysis using the framework. *Before you look at our analysis, try doing your analysis using the framework.* Thinking is a matter of *doing*. The more practice you have in applying the framework, the better you will do. We strongly urge you to do your own analysis before looking at ours. When you compare your analysis with ours, remember that many different analyses can be done. No one analysis is necessarily the best. You might find it worthwhile to discuss your analysis with Professor Hyman or Mike Stiso.

POLARITY THERAPY

The following is extracted from Cooper-Hunt, Major C.L., M.A. (Cantab). Ps.D., Ms.D., D.D., Ph.D., M.S.F. (1969). *Radiesthetic Analysis*. Mokelumne Hill, CA: Health Research.

Whether one employs a rod or a pendulum or one of the latest instruments designed to detect and measure the radiations of the human body in its many cell-groups, there is almost an infinite number of findings which can be of the utmost value to an enquirer.

One very useful reading--to begin at the beginning of our specialised form of analysis which my wife and I have evolved over the years in our Radiesthetic Healing Practice--is the polarity of the patient.

Hitherto it had always been thought that we should sleep at night with our heads to the North and our feet to the South. We have found through Radiesthesia that this varies with the individual. Some should sleep with their head to the South East or South West, North East or North West according to the finding on the instrument.

As to the supreme importance of this we cannot say as yet, and since we are not anxious to produce faddists or to disrupt the domestic harmony by dislocating the arrangement of the furniture, we do not lay down an inflexible law for any patient. At the same time we have found the item to be of practical value clinically. May I cite two cases of actual fact.

The first was a patient who complained of acute insomnia, which nothing would relieve. We discovered that the lady was sleeping with her head in the wrong polarity. Radiesthetic examination indicated a different alignment and the patient advised to try it out. She braved the

domestic strife and her subsequent report was complete harmony and sound sleep. In other words during the hours of nightly refreshment the Cosmic Forces of renewal were unhindered by incorrect polarity in the sleeper and were allowed to flow freely through the inner Being of the patient.

The other case I can cite was that of a little girl, who was greatly troubling her household by extreme restlessness during the night. She was brought to us for a test of polarity and our advice was adhered with an immediate satisfactory result of complete harmony and deep sleep.

I can only add therefore in conclusion that the test of polarity and the applying of it in this way, provided that friction is not caused in the household, seems worthwhile. It is easily ascertainable, by any worker with the pendulum or rod, etc., by holding a specimen of the patient's blood or hair or hand-writing in the receiving hand (left hand of a right-handed operator), maintaining the desired thought in consciousness, whilst functioning with the power-hand, which holds the pendulum.

**Please try doing your own
analysis before reading the
sample analysis that follows.**

ANALYSIS OF SAMPLE CASE #1

1. What is the issue or question?

Can insomnia and restless sleep be cured by having people sleep in alignment with their polarity? Can an individual's "polarity" be diagnosed by using a dowsing instrument?

2. What is the claim [what is the proponent arguing for]?

Major Cooper-Hunt is citing his two cases just because they support his belief in polarity therapy. We do not know how many other cases he has encountered and how many of them have also resulted in successful outcomes, if any. However, we use the principle of charity and try to formulate his claim as if he had actually conducted a test. The component parts of the claim are:

- ES: The *Explanatory System* in this case appears to be a hypothetical system in which people have polarities and sleep harmoniously when they sleep in a position that is consistent with their polarities. They will encounter disturbances in their sleep patterns if they sleep with their bodies oriented out of harmony with their polarities.
- H: The *Hypothesis* is that this ES is true. It applies to the real world.
- IC: The *Initial Conditions* are that we start with individuals who are diagnosed to be sleeping in positions out of harmony with their polarity and who are suffering insomnia or restlessness during sleep.
- AC: Some possible *Auxiliary Conditions* are that the diagnosis is properly made and that the clients do change their sleeping positions as instructed by the therapist.
- P: The *Predicted Outcome* is that when the clients re-orient their sleeping positions to be consistent with their polarities they will no longer suffer sleep disturbances.

The complete claim, in the conditional format, now becomes: *IF (H & IC & IC) THEN P*. Or to flesh it out fully: *IF (POLARITY THERAPY IS VALID and IF WE INSTRUCT AN INDIVIDUAL WHO HAS BEEN SLEEPING IN A POSITION INCONSISTENT WITH HER POLARITY AND IS SUFFERING FROM SLEEP DISTURBANCE TO CHANGE HER SLEEPING ORIENTATION TO BE IN HARMONY WERE HER POLARITY and THE CLIENT FOLLOWS INSTRUCTIONS) THEN SHE WILL NO LONGER SUFFER SLEEP DISTURBANCE*.

3. What reasons are offered to support the claim?

Here the "predicted outcomes" were two individuals who, after following instructions, no longer suffered sleep disturbance.

4. How strong is the support?

For any claim in the conditional format, at least three critical conditions must be satisfied:

Condition 1: The predicted outcome must logically follow from the antecedent if the *ES* is true. For example, the *ES* in this case clearly states that people who sleep in harmony with their polarities will be free of sleep disturbances. Suppose Cooper-Hunt gave us as support that one of his clients won the lottery after altering her sleeping position to be in alignment with her polarity. This would be questionable evidence for polarity therapy because nothing in the *ES* as described says anything about winning lotteries. In other words, the predicted outcome must be *relevant* to the *ES* and *H* being tested.

Here we can assume that Condition 1 has been satisfied if the *ES* is as Cooper-Hunt has described it. We are using the Principle of Charity here because we are assuming that Cooper-Hunt did not change his *ES* after the fact to fit the actual outcome that he observed.

Condition 2: Condition 1, however, is insufficient to insure a good test of the claim. This is because the predicted outcome can occur for reasons other than the truth of the hypothesis. The conditional claim guarantees the predicted outcome if the hypothesis, the initial conditions, and the auxiliary conditions are satisfied. By itself, however, the claim does not exclude the possibility that predicted outcome might occur for other reasons. To guard against this possibility, a good test should insure that the probability of *P* is very unlikely if *H* is false. In other words we want the following condition to hold:
If (not-H & IC & AC) then very likely not-P.

What about Condition 2 in this case? If *ES* is not true, is it plausible that we would observe two individuals sleeping well after realigning their sleeping position to be consistent with their polarities? The answer is 'Yes.' And this could be so for a number of uncontrolled reasons. One reason is that people can have periods of restless sleep followed by sound sleep for no apparent reason. A second reason is the placebo effect--because they believe that they will sleep better by changing their orientations, this might be sufficient to enable them to sleep better. This is also known as a self-fulfilling prophecy. A third reason is that we have heard only about two cases. What if we observed several more cases? Would they all have the same outcome? In other words, we need much more data.

Condition 3: Another important requirement for a good test we have to make sure *prior to observing the outcome* that the criteria for deciding whether *P* (success) or *not-P* (failure) have been clearly and objectively established. This obvious requirement is very frequently violated. For example, the dowser Henry Gross located on a map a place to drill a well in Bermuda. Gross and his followers claim that the well was successful. The authority that I contacted in Bermuda said that the well was a failure because the water it produced was sea water and undrinkable. Gross's supporters argue that the well was a success but that the users were withdrawing the water in such a way that they were mixing the good with the bad water.

This third condition could also present a problem for Cooper-Hunt's case. He does not make it clear what criteria were used to determine the sleep disturbances of his clients and how it was decided that they had in fact improved. Did a physician or other expert independently examine the clients before and after? Were clear cut criteria for success or failure established in advance?

Even using the principle of charity, we can see that the support for the claim in this case is weak. Two cases are insufficient. Even in these two cases, the criteria for success or failure are vague. And alternative causes for the apparent successes such as placebo effects, spontaneous remissions, and self-fulfilling prophecies have not been eliminated.

5. What would be adequate support?

The general answer here is a test that meets all three conditions. For Condition 3, we would want an independent and "blind" expert to determine the initial state of the clients and their condition after the treatment. The experts should be "blind" in the sense they should not be aware of which clients have been given the true treatment. We would also want a "blind" control comparison to cover Condition 2. One possibility is to have several clients with sleep disturbances. All would be diagnosed for polarity by the dowser, but none would be told the results. Then we could have several of them reverse their sleeping orientations. Half of these would be now sleeping in alignment with their polarity and half would be sleeping out of alignment. If the "blind" expert, under these conditions, found that significantly more of those who are now sleeping in alignment with their polarities got better as compared with those who are now sleeping out of alignment, this would constitute reasonable support for the hypothesis.

SAMPLE CASE #2

In 1944, the psychologist Crider published a study of a psychic or character reader⁴. Margarita S. was 30 years old and had been a character analyst for 15 years. Her clients gave her excellent testimonials. To test her abilities, Crider conducted the following experiment. Margarita saw each of the 16 female college students from Crider's class in the author's office. Each student was seen individually. The analyst made a series of statements about each student. The statements were made one at a time and written down. The subjects had been instructed not to react to the statements. Margarita made from 19 to 25 separate statements about each student. After the 19 or more statements were written down they were handed to the student who checked those with which she agreed.

Crider reported that in seven of the analyses there was no disagreement at all. In only one of the analyses were there as many as three disagreements. All told, for the 16 analyses, Margarita made a total of 364 statements. Of these statements, the students disagreed with only 22. In other words the students agreed with 96% of the statements made by Margarita. Crider

⁴ Crider, B. (1944). A study of a character analyst. *Journal of Social Psychology*, 20, 315-318.

provided two sample analyses. We give one of these below:

1. Does not like to take chances.
2. Very-very sensitive.
3. Very self-conscious.
4. Gets along well with boys.
5. Above-average student.
6. Worries about her studies.
7. Introvert.
8. Over-emotional, tries to conceal it.
9. General health good.
10. Love life not in settled stage.
11. Has had broken love affair.
12. Should not be in business world.
13. Appreciates good music.
14. Must always have feeling of security or else is uneasy.
15. Is of generous and cooperative nature.
16. Digestive organs normal.
17. Heart normal.
18. Kidneys normal.
19. Finds it hard to ask favors.
20. Should not be given technical work.
21. Does not like routine either.
22. Very stubborn.
23. Bad temper when aroused, yet she doesn't display it often.
24. This girl would be happiest when being supported.
25. Has many big dreams.

Crider stated that, "Psychologists may say that the statements are mostly complimentary, that they are too general, that they will apply to anyone. However, from what I knew of the students, I was in substantial agreement with the analyses as presented. More interesting is the fact that the students were satisfied, and in their discussion with each other following the analyses they were of the opinion that the analyses were surprisingly accurate."

Crider also supplies a statement from Margarita:

I believe we can and do absorb and register in our feeling worlds, the emotions and feelings of those we contact. Some people are more sensitive and can do this at will. I have been able to analyze personality, emotions, and temperament just by the impressions I receive while looking at an individual. I do not read the features or contours of the face. My findings are determined by thought vibrations which emanate from the individual. Those vibrations enter my emotional world and caused the same vibratory frequency to occur in my feelings. Thus, I feel what the individual feels.

Crider concludes: "Since she is one of several who are doing similar work I believe it is of considerable interest to psychologists to know how our competitors work; much better, in fact,

to try to understand them than to scoff at them."

**Please try doing your own
analysis before reading the
sample analysis that follows.**



ILLUSTRATIVE ANALYSIS

1. What is the issue or question?

Can this character reader, or any fortune teller, accurately assess a client's personality just from mysterious vibrations or thought emanations? In other words, is there something beyond normal science taking place? [Note that the issue can be stated in many ways. You can focus on the abilities of this character reader. Or you can focus on the abilities of fortune tellers in general.]

2. What is the claim [what is the proponent arguing for]?

Crider is arguing that Margarita can accurately assess character. He suggests that she can do so by means unrecognized by psychology or science. We can put his hypothesis in the *conditional format*⁵. To do this we need to identify the following components of a conditional claim:

1. **Explanatory System.** In the present example, the *ES*, although vague and implicit, can be said to be about a *psychic system*. In a psychic system individuals, known as psychics, can obtain information, by means unknown to science, about individuals.

2. **Theoretical Hypothesis.** Although the *ES* cannot be true or false, the theoretical hypothesis can be true or false because it states that the theory happens to be true of some real world system. In the present example, the theoretical hypothesis states that Margarita is a real world system that is also a psychic system. We will symbolize the theoretical hypothesis by the letter *H*. We will always try to rephrase any claim such that the theoretical hypothesis is what is being tested. The claim is that the theoretical hypothesis is true.

3. **Initial Conditions.** A good rule of thumb is that the *IC* describe the state of the system prior to the predicted outcome *P*. Here the predicted outcome is that Margarita will accurately describe the students. So we would want to insure *IC* such that Margarita is presented with students whom she does not know anything about by conventional means.

4. **Auxiliary Conditions.** Generally, we have to consider extraneous factors that could interfere with the outcome of any test of a theoretical hypothesis. In the current example, an auxiliary condition might be that the conditions under which Margarita is making her statements are such that they do not interfere with her powers. We have to be careful here. The auxiliary conditions often are brought up as an "escape clause" when the test of the claim does not support the claimant. To be reasonable, any auxiliary condition must be clearly stated before the test is conducted and should be agreed to by all parties. We will symbolize the auxiliary conditions by the letters *AC*. Further *AC* include conditions such that she is given no obvious information about the clients during the reading--such as

⁵ This part of the framework is loosely based on Ronald Giere's suggestions for testing theoretical hypotheses in Giere, R.N. (1979). *Understanding scientific reasoning*. New York, NY: Holt, Rinehart & Winston.

clues from their dress, physical appearance, and reactions.

5. Prediction. The prediction refers to the outcome of the test of the theoretical hypothesis. A good prediction has to be carefully specified so that the outcome can be objectively determined by all parties. All possible outcomes have to be classifiable, *before* any observations are made, as either confirming or disconfirming the hypothesis under test. Unfortunately, Crider did not clearly specify in advance what was going to count as a successful outcome and what was going to count as an unsuccessful outcome of his test of Margarita. Crider is not alone. Almost all people who argue that their claims are supported by outcomes, rarely specify clearly in advance what was going to count as a success. More important, a good test is one that clearly spells out in advance exactly what outcomes will *falsify* the claim. He points to two sources of evidence in favor of Margarita's claim. One is that 96% of the statements she made about his students were accepted by them as true. The other is his own impressions that what she said about his students agreed with what he knew about them. What if the students had accepted as true only 80% of the statements? Would he still have considered that a successful outcome? What about 70% or 60% or 50% or 40% or 30%, etc.? One possibility is that Crider, like many other people, had assumed that 50% acceptance was chance, and that any significantly higher percentage was evidence that Margarita could do better than chance. So let's assume that the predicted outcomes were as follows: 1) success (any percentage of hits above 50%), and failure (any percentage of hits of 50 or lower). We symbolize the prediction by the letter *P*.

The general conditional format for any claim in symbolic form would be:

IF (*H & IC & AC*) THEN *P*

For this particular case, this would be something like the following:

IF (*Margarita is a psychic & if she makes statements about individuals about whom she has no information gained through normal means & if nothing in the situation interferes with her powers*) THEN *the individuals will accept more than 50% of her statements as accurate descriptions of themselves.*

3. What reasons are offered to support the claim?

Crider offers three reasons to support his claim. 1) 96% of Margarita's statements were judged accurate by the students; 2) the combined opinion of the students; 3) his own agreement with the assessments. Notice that in our rephrasing of the claim in the conditional format, we focused on just one prediction--the one about the percentage of statements accepted as true by the clients. The fact that Crider points to three different kinds of outcomes to support his conclusion raises interesting questions. Depending when and how the possible outcomes were specified, multiple outcomes could make the argument stronger or weaker. We will discuss such matters during the lectures.

Only the first reason offers the possibility for an objective determination of whether the outcome of the prediction was successful or not. The second two reasons are useless as evidence

because they are based on subjective opinions and are easily influenced by factors other than the actual accuracy of the statements.

4. How strong is the support?

Ideally, we should be able to decide if a test of a theoretical hypothesis is a good or bad test *before the outcome of the prediction is known*. This is because, as we will emphasize throughout this course, a good test satisfies at least three important conditions

Condition 1: The predicted outcome actually follows logically if the theoretical hypothesis is true. This will be the case if we have carefully specified the conditional claim:

If ($H \& IC \& AC$) then P .

Condition 2: However, Condition 1 by itself is insufficient for a good test of H . This is because the predicted outcome could occur for reasons other than the truth of the hypothesis. To guard against this possibility, a good test should be one where the probability of P is very unlikely if H is false.

If ($\text{not-}H \& IC \& AC$) then very likely not- P .

Condition 3: In addition to making sure we select P such that it is unlikely to occur unless H is true, we have to make sure that whether P or *not- P* will be the outcome of the test can be objectively decided in a clear-cut fashion by all observers.

In Crider's test of Margarita, he did not clearly specify his prediction in advance. We have used *the principle of charity* in reconstructing his claim. *The principle of charity* states that we should always try to evaluate a claim by formulating it in the strongest, possible form. In our reconstructed form, Condition 1 seems reasonable. That is, it makes sense that if Margarita is truly psychic, the students will accept most of her statements as true of themselves. Crider's case is considerably weakened by his failure to fulfill Condition 3. Nowhere does he state what his specific prediction had been and how we could decide whether it had succeeded or failed. Using the Principle of Charity we have tried to help out by specifying an objective prediction that he might have had in mind. However, even if we consider Condition 3 to be met, we will find that Condition 2 is questionable. In other words, further examination raises doubts about whether P is unlikely if Margarita is not a psychic. In other words, we have good reason to suspect that a large proportion of the statements will be accepted as true by the students even if Margarita has no psychic abilities.

Several points could be made. Margarita sees each student as she makes her analysis. She can gain clues from dress, jewelry, posture, etc. For example, if the student had a major health problem, this could be obvious just from observation. Although Crider instructed the students not to react to the statements, we do not know if the students gave unintentional bodily or other cues. Consider, as well, that this study was conducted in the early 1940s when females traditionally did not go to college. The few who did came from upper class families and would obviously be healthy, well-off, etc.

We could also question the use of the student's own self-evaluation as a suitable criterion. But the most serious limitation is the lack of a control baseline. What percentage of female

college students in 1944 would accept these statements as true of themselves under the same circumstances? In the sample analysis we find statements such as: *Digestive organs normal. Heart normal. Kidneys normal.* How many young, female college students from upper-class families are going to have abnormal digestive, heart, and kidney problems?

[Later in the course we will learn many reasons why the use of the students' self-assessment is fallacious.]

5. What would be adequate support?

The answer to this question is implicit in the answer to question 3. One possibility is to use objective personality assessments as a criterion against which to correlate Margarita's statements. [This is trickier than it seems as we will discuss in class]. Ideally, we would want a control baseline against which to evaluate her apparent rate of success. For example, later studies had some students evaluate those statements actually made about them. Other students evaluated statements made for someone else that they believed were made for them. Under these circumstances both groups accept the same proportion of statements as accurate self-descriptions.

You will usually find a good answer to this question by focusing on how to fulfill Conditions 2 and 3. Condition 2, for example, reminds you to consider what would be outcome if the theoretical hypothesis is false. What if Margarita has no psychic powers? One way to find out is to compare her performance with someone who does not claim psychic powers.

6. What reasons might create (false) beliefs in the claim by the proponent and followers?

Both the textbook and the lectures will supply you with many reasons why an experiment such as Crider's seems to give positive results. Subjective or Personal Validation turns out to be untrustworthy. Language is ambiguous. Everyone possesses all traits. We differ from one another in terms of the degree to which we exhibit such traits. Am I introvert or extrovert? This depends both on the circumstances and with whom I am being compared. Other principles that apply here, and that you will learn about in the course, are illusory correlation, the power of the situation, and conversational maxims.

OTHER FRAMEWORKS

In this course we require you to write your exercises using the framework (the eight questions) previously described in this syllabus. Besides this framework, we also require you to use the conditional form for stating the claim being evaluated. Many other frameworks have been suggested for aiding thinking. Most of them probably help your thinking because they force you to systematically consider various aspects of the problem and several alternatives. Also, as I have already said, no single framework is ideal for every situation. You may find it helpful, even when using the course framework, to supplement your considerations with other frameworks. You will

find several such frameworks in Halpern. Please check with us before you use one of these frameworks to make sure that we agree as to what constitutes an appropriate framework.



Can you identify the object in this picture?

Graphic Organizers

One type of framework that can usefully supplement our present framework is what your textbook calls *graphic organizers*. These are also called *concept maps* or *mind maps*. A variety of systems to make such graphic patterns exist. There is no unique or correct way to diagram a problem, text, or claim. Typically, you identify key concepts or points and place them on a blank sheet of paper. You then use lines and arrows to connect concepts that relate to one another. Don't worry if your resulting diagram is correct, complete, or neat. The very effort to construct the graphic representation often brings out ideas and thoughts that you may have overlooked. At its best, the graphic organizer can clarify the underlying structure of the problem and can open new ways to think about the issues.

The diagram on page 24 illustrates one attempt to construct a conceptual map or graphic organizer of the sample case. Although the map is far from complete, you can see that it is already rather cluttered. However, it provides you with one idea about how to apply this technique. The graph is organized around one central concept *The Psychic Reading*. The arrows from this central concept point to objects such as: *Margarita (the psychic reader)*; *The Client (or student who receives the reading)*; and *The Reading itself (the set of statements uttered by Margarita for this client)*. Because of space considerations I omitted a number of other possible items to include.

Consider first the subtopic *The Reading*. The Reading consists of the set of statements Margarita makes about each client. The arrow going from Margarita to the Reading indicates that Margarita is the source or immediate creator of the Reading. The arrow going from the Reading to the Client shows that the Client is the recipient of the Reading. The arrow from the Client to Margarita indicates that the Client provides input to Margarita that may form the basis for her reading. Another arrow shows that the Reading consists of Statements. The Statements, in turn, are classified according to Types (or content) and Properties. We can classify the Types of statements into Traits, Relationships (with boys, etc.), Studies (concern about tests, etc.), Career, and Health. Some Properties of these statements are that they are Vague, Universal, and Categorical. By *Universal* I mean that the statements apply to any client just because they are human. For example, the statement *Must always have feeling of security or else is uneasy* applies to any human. Almost by definition someone feels uneasy if they do not feel secure. By *Categorical* I mean that certain statements will be true of the client just because she belongs to certain categories. Being a college student, for example, automatically insures that she will be concerned about grades. All the statements are vague in one way or another.

Presumably the Reading is about the Client. To the extent the statements correctly apply to the client, they presumably are based upon information that Margarita gets from the Client. One source of information comes from the Client through *Categories, Signs, and Feedback*. Among other things, Margarita knows that her Client in Crider's study is a young female, belongs to the upper class, and is college student. She might also detect other categories to which her client belongs (e.g., she may be wearing a Phi Beta Kappa pin). By having the Client in her possession Margarita obtains *signs* such as physical appearance (size, body type, weight), posture and carriage, dress, hair style, jewelry, and the like that can provide useful information about the client's personality, confidence, taste, wealth, etc.

Although the clients had been told not to react to the statements the possibility of unwitting feedback from facial expression, pupil dilation, body language, breathing, and the like still existed.

To the extent that Margarita's Reading was affected by such *Normal* inputs, there would be no reason for psychologists to take further interest. Crider's report implies, however, that Margarita goes beyond normal sources of information. She claims, and he implies, that her sources of information are occult or *Paranormal*. That is, she supposedly has access to information that goes beyond what contemporary psychology and science recognizes as possible. One can focus on trying to decide if, indeed, she has access to occult information. To do this, you would want to block her access to the normal sources. However, before going to such trouble, you would first want to make sure that her readings do contain information that accurately discriminates the Client from other people.

Using Graphic Organizers

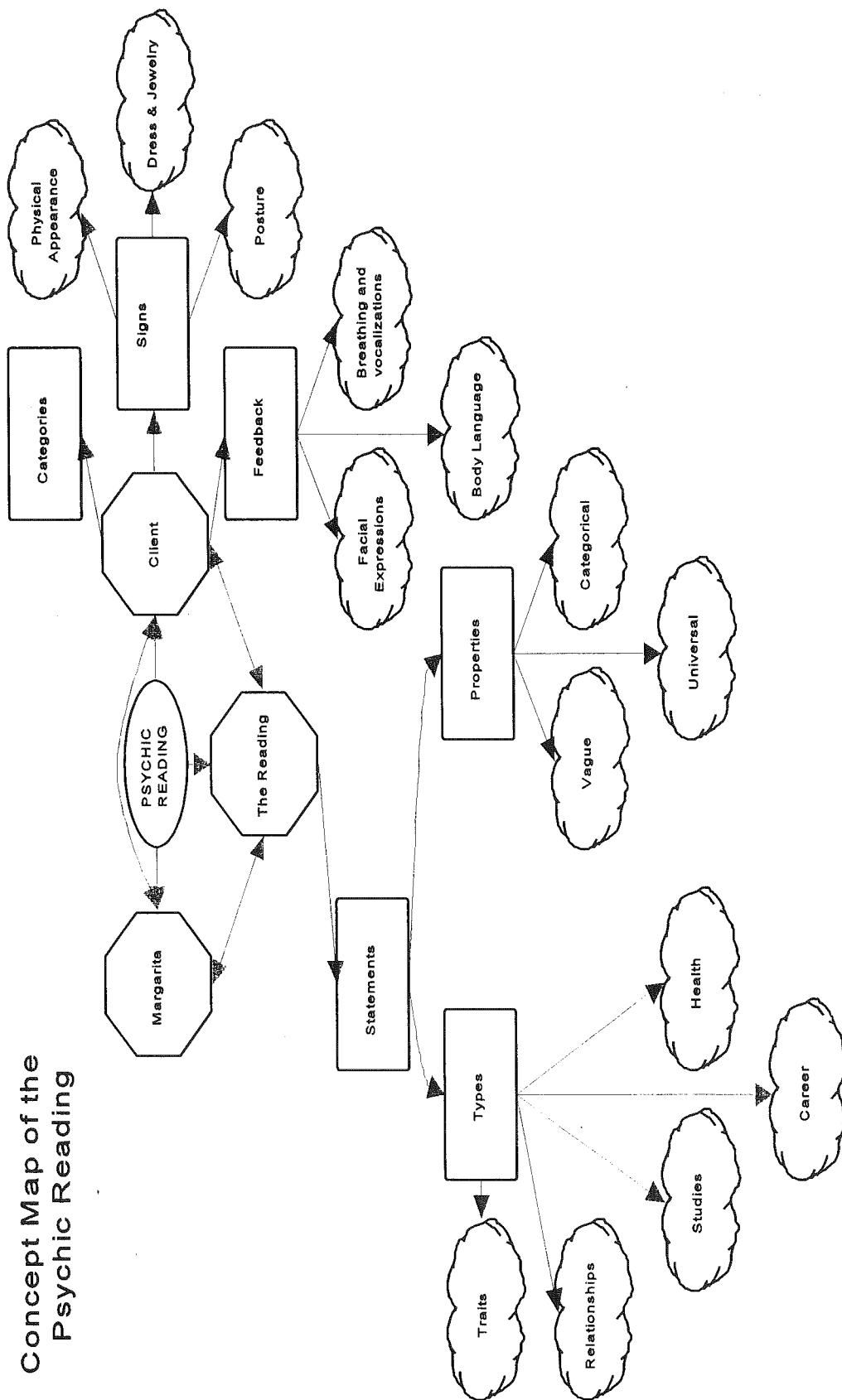
The best way to use graphic organizers in this course is *before* you apply the framework to the exercises. If you construct a conceptual map of the exercise, this will help you insure that you are not overlooking some important points. The activity of making the map will also stimulate new ideas and associations and help you grasp the underlying issues, structures, and

questions.

Read Chapter 3 of your text to get ideas about different types of graphic organizers and how to construct them.. Buzan and Buzan⁶ suggest the following categories for making these organizer: *Basic Questions* (how, when, where, why, what, who, which), *Divisions* (chapters, lessons ,themes), *Properties* (characteristics of things), *History* (chronological sequence of events), *Structure* (forms of things), *Function* (what things do), *Process* (how things work), *Evaluation* (how good/worthwhile/beneficial things are), *Classification* (how things are related to each other), *Definitions* (what things mean), *Personalities* (what roles/characters people have). They also suggest that you keep the number of lines or arrows coming from any concept to seven or fewer.

⁶ Buzan, T., & Buzan, B. (1994). *The Mind Map Book*. New York, NY: Dutton.

Concept Map of the Psychic Reading



Some Problems To Ponder

Your textbook contains many problems and puzzles worth thinking about. A sampling of these would be:

1. The candle problem (Page 14)
2. The story about the young boy who is rushed to the hospital for surgery (Page 15)
3. Cutting the cake into 8 equal pieces (Pages 17-18)
4. Outbreak of disease (Page 97)
5. The Wason Four Card Problem (Pages 131-134)
6. The Linda problem (Page 255-256)
7. The birthday problem (Page 260)
8. The Wason Induction Task (P 289)
9. Multiplying $8 \times 7 \times 6 \times \dots \times 1$ vs $1 \times 2 \times 3 \times \dots \times 8$ (Page 293)
10. The Parallelogram (Page 323)
11. The bear problem (Pages 328-329)
12. The monk problem (Pages 329-330)
13. The radius problem (Page 330-331)
14. The tumor problem (Page 334-335)
15. The Two Strings (Page 348)
16. The nine dot problem (Page 356-357)
17. The bus driver (Page 356)
18. The ping pong problem (Page 358).
19. The pebble problem (Page 367)

Here are a few other problems worth pondering:

1. Try to identify the object (which can be a living or non-living thing) in the picture on the page 25..

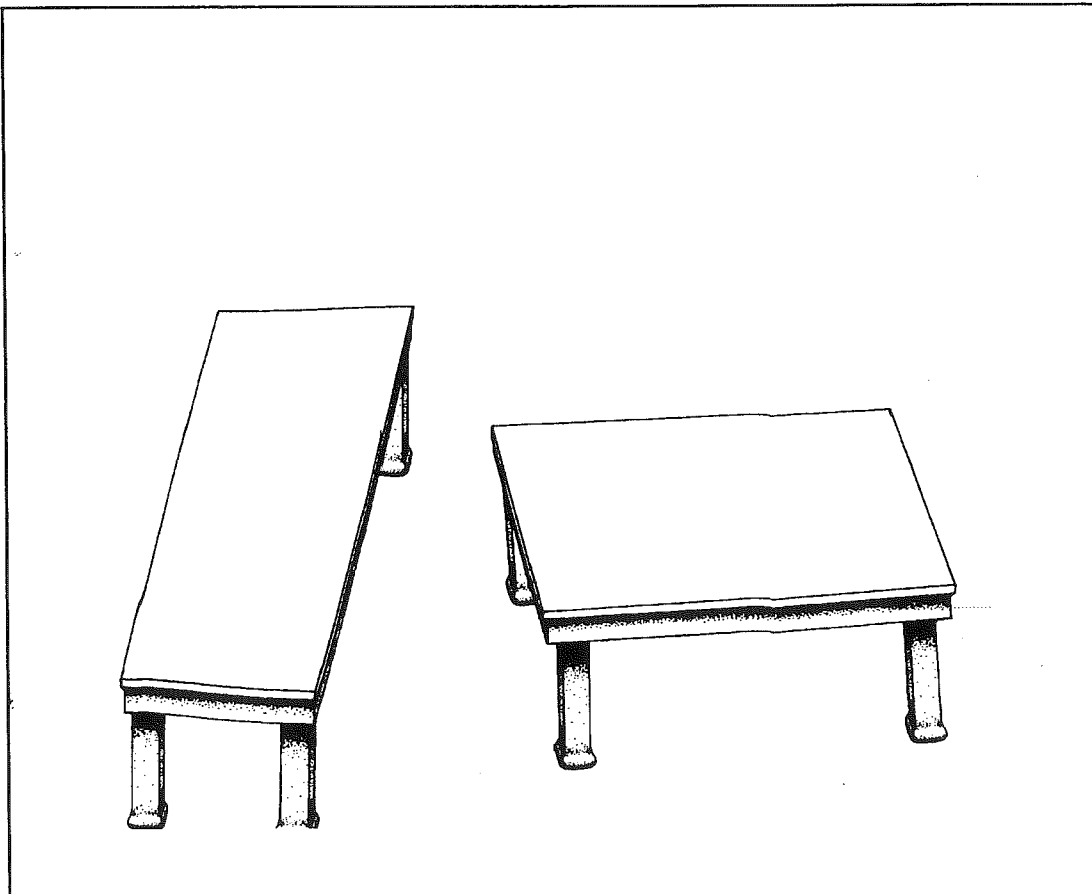
2. Can you identify the object in the box on the right? What do problems 1 and 2 teach us about perception and thinking?



3. Mrs. Jones works on the assembly line at a local factory while her husband stays home and does the housekeeping. Each day Mr. Jones packs the same lunch for his wife. This lunch consists of six sandwiches. He packs two cheese sandwiches in one sandwich bag (each bag holds two sandwiches). He packs two peanut butter sandwiches in another sandwich bag. In a third bag, he packs one cheese and one peanut butter sandwich. He

then puts the three sandwich bags into a larger bag that Mrs. Jones takes to work. One day, well before lunch time, Mrs. Jones stomach begins growling with hunger. While using one hand to continue with her demanding assembly routine, she reaches under her seat with the other hand, opens her large lunch bag, reaches into the bag and opens one of the three sandwich bags. She then removes a sandwich from this opened bag and begins eating the sandwich while still focussing on her assembly duties. The sandwich turns out to be a cheese sandwich. What is the probability that the remaining sandwich in the sandwich bag from which she obtained the cheese sandwich is also a cheese sandwich?

4. A soldier is lying in a hospital bed. A nurse enters the room and asks, "Are you better today?" The soldier replies, "I think not." He then vanishes. Who was the soldier?
5. The following figure was created by the Stanford psychologist Roger Shepard [See his book *Mind Sights* for more examples of his ingenious perceptual/artistic creations]:



Look carefully at the two table tops. Each is created by a rectangle drawn upon the flat surface of the paper. Do these rectangles look like they coincide? That is, if you cut out the rectangle that represents the top of the left table, would it exactly cover the rectangle that represents the top of

the right table? Check your impressions by tracing the rectangle of one table top and superimpose it on the rectangle of the other table top. How do you account for the result?

6. A hotel detective was making his rounds through the corridors of the hotel. As he passed by a room, he heard a voice behind the closed door. The voice yelled, "Don't shoot, John!" Immediately afterwards, the detective heard a gun discharge. He immediately broke into the room and encountered this scene. A dead woman was lying on the floor. Next to her was a gun. Three people were standing around her. They were a judge, a soldier, and a mail carrier. The detective immediately arrested the mail carrier for murder. How come?

7. How many animals of each kind did Moses take upon the ark?

8. Julius Caesar was assassinated on March 15, 44 BC. As he was dying, he saw his friend, Brutus, among the assassins. With his last breath, he uttered, "Et tu Brute!" With his last breath he also exhaled molecules into the atmosphere. How probable is it that the next time you inhale, you will inhale at least one of the molecules exhaled by Julius Caesar over 2,000 years ago?

9. I purchased a watch along with the watch band. Together, the watch and the band cost a total of \$110. The watch cost \$100 *more* than the band. How much did the band cost?

10. I wear only brown or blue socks. I keep them all mixed up in my dresser drawer. One morning I get up when it is still dark and reach into the drawer to get a pair of socks. What is the least number of socks that I must remove from the drawer to insure that I have at least one pair of the same color?

11. The psychologist Max Wertheimer related this story in his book *Productive Thinking* [1945]:

Two boys were playing badminton in the garden. I could hear as well as see them from my window, although they did not see me. One boy was twelve, the other ten years old. They played several sets. The younger boy was by far poorer; he was being beaten in all the games.

I heard some of their conversation. The loser--let us call him *B*-- became more and more unhappy. He had no chance. *A* often served him so cleverly that he could not possibly return the bird. The situation grew worse. Finally *B* threw down his racket, sat on a tree trunk, and said, "I won't play anymore." *A* tried to persuade him to continue. No answer from *B*. *A* sat down beside him. Both looked unhappy.

I interrupt the story here to put a question to the reader: "What do you suggest? What would you do if you were the older boy? Do you have a productive proposal.?"

12. A reader sent this question to Marilyn vos Savant who has the weekly column in *Parade Magazine*:

A shopkeeper says she has two new baby beagles to show you, but she doesn't know whether they're male, female, or a pair. You tell her that you want only a male, and she telephones the fellow who's giving them a bath. "Is at least one a male?" she asks him. "Yes!" she informs you with a smile. What is the probability that the *other* one is a male?

13. You are told that a bag contains four colored balls. Two are red, one is blue, and one is black. A demonstrator reaches into the bag and randomly grabs two of the balls. Without letting you see what is in her hand, she looks at the two balls and tells you that one of them is red. What is the probability that the other ball in her hand is also red?

14. Two politicians are being interviewed, a Democrat and a Republican. "I'm a Democrat," says the woman. "I'm a Republican," says the man. Assuming that at least one of them is a liar, which one is it?

15. "I am your long-lost sister," says Amy to the man, who indeed has one (but only one) missing sibling. "She's lying--*I'm* your long-lost sister," Barbara insists at the family reunion. "At least two of us always lie," smirks a third woman, Carol. Assuming one of these women really is his long-lost sister, which one is it?

16. Three men, Alphonse, Benjamin, and Carlos, close their eyes while someone puts on the head of each either a black hat or a red one. They open their eyes. Each man sees the two hats not his own. Each man has been instructed that if he sees a red hat, he should raise his hand. As soon as he knows the color of his own hat, he must say so.

Suppose all three hats are red. The three men raise their hands. After a period of time, Carlos, who is smarter than the others, says: "My hat is red." How does he know?

17. In a certain African village there live 800 women. Three percent of them are wearing one earring. Of the other 97 percent, half are wearing two earrings, half are wearing none. How many earrings all together are being worn by the women?

18. Patty's job in the Peace Corps was to teach something about American history to the children of the primitive Ungawa tribe. One day she showed a list of the American presidents, in order, to a smart young native boy. "I remember reading somewhere," Patty said, "that three of our country's first five presidents died on July 4, which is America's Independence Day. I don't remember which presidents they were, however."

"One of them was James Monroe," the boy said, much to Patty's amazement. Assuming the boy knew nothing of American politics and history, how could he have come by such obscure knowledge as the date of a president's death?

19. A man bought a horse for \$60 and sold it for \$70. Then he bought it back again for \$80 and sold it for \$90. How much did he make in the horse business?
20. Smith gave a hotel clerk \$15 for his room for the night. When the clerk discovered that he had overcharged by \$5, he sent a bellboy to Smith's room with five \$1 bills. The

dishonest bellboy gave only three to Smith, keeping the other two for himself. Smith has now paid \$12 for his room. The bellboy has acquired \$2. This accounts for \$14. Where is the missing dollar?

21. Imagine you are given a cup of coffee and a cup of milk, with equal amounts of liquid in the two cups. A spoonful of milk is transferred from the milk cup to the coffee cup, the coffee is stirred, and then a spoonful of the mixture is returned to the milk cup to that the end the amount of liquid in the two cups is still the same. Is there more milk in the coffee cup or more coffee in the milk cup or what?

CASES FOR YOUR EXERCISES

Here are the cases or examples for each of the four exercises. We prefer that the exercises be typed, but if they are handwritten you are responsible for their legibility. If we cannot read your writing, we will not grade the exercise. Please follow carefully the instructions (and example) on how to format your exercise in the syllabus. Remember to number and provide an answer for all eight questions in the framework.

The first three exercises are worth up to 10 points each. The fourth exercise is worth up to 20 points. We will award points for the first exercise as follows:

- 1 point for Question 1
- 2 points for Question 2
- 1 point for Question 3
- 3 point for Questions 4 & 5
- 2 points for Question 6
- 1 point for Questions 7 & 8

The exercises are the core of this course. You must complete all four of them in a timely manner to pass the course. We will especially be looking for improvement from one exercise to the next. We will devote much of the lectures towards providing you additional examples and tips for doing the exercises. To succeed fully on the exercises you will need to use concepts from both the lectures and the textbook.

CASE FOR EXERCISE #1

This first exercise is due *January 21, 1997*. For your report, please use the framework of eight questions listed under *Instructions* in the syllabus. These questions will provide the general framework for coping with all the claims encountered in this course. In writing your report, number and write out each question along with your answers. Try to keep each answer short and to the point. Remember to phrase the claim under question 2 *in the conditional format* [see the syllabus for more details]. Your report should be approximately four pages. The reports do not have to be typed, but they should be legible. We will give no credit for illegible reports. We will downgrade late reports, or assign them zero. In answering the questions, use what you have learned from the text and the lectures when possible. For example, you should find the information in Chapter 2 useful in doing this exercise. We will give bonus points for the use of an additional tool from the textbook. List this tool as item 9. To get the bonus points, of course, you have to demonstrate that your use of the tool added to quality of your report.

The following is excerpted from Christopher Bird (1977), "Applications of Dowsing: An Ancient Biopsychological Art," in J. White & S. Krippner (Editors), *Future Science: Life Energies and the Physics of Paranormal Phenomena* (pp. 346-365). Garden City, NY: Anchor Books:

"The late John Shelley, Jr., former president of the American Society of Dowzers, during a summer tour of duty as a reserve naval aviator at the Pensacola Naval Air Station in Florida, began to get on the nerves of his fellow officers with his constant proselytizing about the dowsing art at which he was a master. They decided to put John into what they thought would be `his place.'

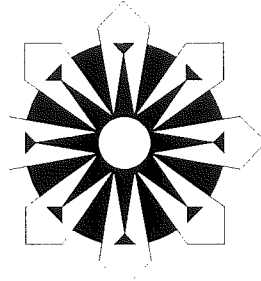
"On the last day of the tour, the reserve pilots lined up at the paymaster's window to collect their checks. When John stepped up to the window, he was puzzled by the guffaws and snickers of his fellow fliers who began to crowd around him in obvious anticipation of what John felt was going to be a joke at

"The paymaster, a smirk chair. `John, you've been talking that silly rod of yours,' he intoned chance. Your paycheck is hidden you want to cash it, you'll just

"The building in question corridor and rooms branching off Unhesitatingly Shelley whipped perennially carried in the breast pocket of his tunic and began silently to ask himself a series of specific questions.

"The rod dipped. Trailed by his still snickering companions he went up to the second floor. He walked along the corridor until, just as he was passing the door to one of the rooms, the rod dipped again. Shelley strode to the middle of the room, his witnesses surging through the door behind him. Rod in his hands, it rotated in an arc until it dipped a third time. It was pointing straight toward a black briefcase on the edge of a table.

"The snickering suddenly stopped as John began to open the briefcase. He looked inside but it contained nothing. The silence was broken with loud laughing. Undaunted, Shelley held the rod over the briefcase. It dipped downward with a violent jerk. Perplexed, Shelley studied the problem for a moment, then noticed a thin gray-black rubber mat underneath the briefcase itself. After removing the case he gingerly took one corner of the mat between thumb and forefinger and raised the mat upwards. There was a U.S. Government check made out to John Shelley, Jr., lying beneath it."



his expense.

on his face, leaned back in his so much about locating things with sarcastically. `Well, now's your somewhere in this building and, if have to find it.'

had three floors each with a long from them on both sides.

out a small plastic Y-rod which he

Exercise #2 is due on February 11, 1997. Please use the same framework you used for Exercise #1 and which is described on page 8 of the syllabus. The case for Exercise #2 is taken from the book In Search of the Healing Energy by Mary Coddington (1978).

"Dr. Brigham studied a number of cases that illustrated the huna⁷ system at work in the realm of instant healing. One of the least complicated accounts among his records is the following, as reported by Long:

'My close and trusted friend, J.A.K. Combs, of Honolulu, who is a fellow student of kahuna lore, and who has given me much invaluable aid, had for a grandmother-in-law one of the most powerful kahunas in the [Hawaiian] Islands. She loved Combs and told him many things about her secret knowledge, her power, and her practices. On the occasion in question, Combs attended a beach party at her country home. Many guests had arrived when a car drove up to the edge of the beach and several Hawaiians got out. Among them was a man who was slightly intoxicated. He missed his step from car to soft sand and fell. As he fell, there was the characteristic snapping sound of breaking bones.

'Inspection showed a compound fracture of the left leg just above the ankle. The bone ends pressed visibly out against the skin. Combs, who had heard the familiar sound of breaking bones and had himself suffered such a break, realized the seriousness of the injury and proposed that the man be taken at once to Honolulu for treatment, but the elderly kahuna arrived on the scene and took over. Kneeling beside the injured man, she straightened the foot and leg, pressing on the place where the ends of the broken bones pushed out the skin, and then began a low chanted prayer for healing. In a short time she fell silent. Those who stood about watching tensely could see nothing until her hands suddenly moved slightly on the man's leg, and she took them away, saying quietly in Hawaiian, "The healing is finished. Stand up. You can walk."

'The injured man, now entirely sobered, rose wonderingly to his feet, took a step, and then another. The healing was complete and perfect. The leg showed no indication of the break in any way.'



⁷ *Huna* refers to a magical system for healing developed in Hawaii many, many years ago.

CASE FOR EXERCISE #3

Exercise #3 is due Tuesday, February 25, 1997. For this exercise you are to apply our framework to the argument for crystal power described in the following passage taken from Edmond Harold's book *Focus on Crystals* [1986, Ballantine Books]. *Make sure you put the claim in the conditional format!*

"Due to their uncanny ability to store memory patterns, quartz crystals can be utilised very effectively by all students, or indeed by anyone who must commit to memory a great deal of detailed information in a very short space of time.

"Selecting two medium-sized crystals, one clear masculine, the other feminine, proceed to programme each in turn according to individual need. A simple programme such as 'record all mental patterns when instructed' would suffice, for the task ahead involves such mental activity. Provided that one repeats this instruction, coupled with a projection of 'love' towards the elemental intelligence of each crystal before each study session, placing the crystals on the work table before you, they will faithfully record all information which is fed into them. (One necessary warning: try to ensure that nobody else handles those crystals from that point on, for their thought patterns or emotions will clear the crystal memory bank.)

"This astounding ability of quartz crystals has been proved on many occasions, but never so positively as with a close friend who recently commenced a 3-year course in naturopathy. This was to prove to be quite a challenge as her greatest disability was a perilously low vitality level which made long hours of detailed study extremely difficult. This weakness was compounded by surgery and, following a course of crystal therapy to restore her depleted vitality, I suggested that she use quartz crystals to assist her.

"Approaching her first examination she became extremely apprehensive, but following my suggestions, she wore a yellow sweater, this being a colour which aids mental activity) and placed the masculine crystal on the floor between her feet, having first instructed the elemental intelligence to release all recorded information. As tension is a major factor in the failure rate among many students, she placed the feminine crystal on the desk beside her--again requesting that all recorded information be released. The masculine crystal between her feet released its activating force into her Etheric Form, providing her with mental and physical stimulus, while the gentler energy of the feminine crystal calmed her fears and doubts.

"Free of stress and feeling calm, she duly completed all papers within the given time--and subsequently passed with a 95 per cent mark. Since that time, further examinations on subjects as taxing as anatomy and physiology have all been passed with equally high marks, all due--she is quite convinced--to the assistance given to her by the quartz crystals. There is, of course, no easy route to follow, for the student must play his or her part to the full and study attentively, in conjunction with duly programmed quartz crystals.

CASE FOR EXERCISE #4

This exercise is due on March 11, 1997. Please note that this last exercise is worth 20 points. You can make it a little longer than the first three exercises. Try to bring in principles you have learned in the course when these are relevant. The following material has been excerpted from a full page advertisement that appeared in the Sunday supplement *Family Weekly*, in the *Eugene Register-Guard*, April 17, 1977. The advertisement was in the form of a full page story. A reader would have to look very carefully and have good eyesight to see the words "Advertisement" printed in extremely small print in the top margin.

Famed Physicist Proves That Sitting In A Pyramid Causes Unexplainable Good Things to Happen.

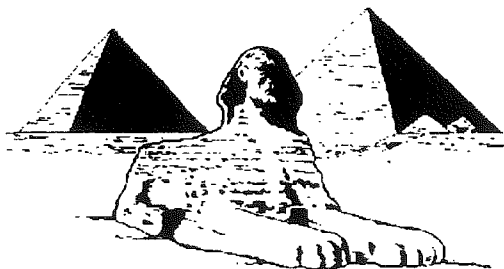
HISTORY REVEALS SUCH BENEFITS AS LONGER LIFE, SPONTANEOUS CURING, REDUCED AGING & MIND EXPANSION

"Whoever is responsible for the construction of The Great Pyramid fully understood more about the science of mathematics and the exact dimensions of the Earth than modern science did up until the International Geophysical Year 1957-1958. Curiously, buried within the measurements is a key to the structure of the entire solar system:

- Dimensions, shape and weight of the Earth
- Distance from the Earth to the Sun
- Hours, minutes and seconds in a day
- Average temperature of the Earth

"The Pyramid is aligned True North with error less than 5' of one degree; is level over 13 acres to within one-half inch; and is situated exactly on the meridians which divide the land masses of the Earth into quarters.

"The aura of mystery and intrigue remained intact for 45 centuries. Rumors of magic and mysterious forces relayed the message of this strange phenomenon from one generation to the next.



"And then the living legend of the pyramid captured the attention of world-renown scientist, G. Patrick Flanagan. Dr. Flanagan's decision to probe the mysterious energy fields which pyramids contain led him to the threshold of a new technology heretofore unknown to man. Work proceeded on the assumption that where there exists a physical phenomenon, there also exists a physical answer. Pyramid Power has graduated from the realm of the mystical to that of an actual science. Through his precise, carefully controlled scientific experiments, Dr. Flanagan has proven that the force called the

'Power of the Pyramid' does exist. Not only has he proven its existence, but he has actually been able to duplicate it.

Dr. Flanagan Talks About Pyramid Power

"Pyramid means 'fire in the middle.' Quite obviously, there is no real fire, but rather 'energy in the middle.'

"It is important to understand that pyramids have no energy source in themselves; they trap energy inside much like the glass walls of a greenhouse trap rays of sunlight. The geometric shape acts as a lens, absorbing vast amounts of biocosmic energy which is constantly bombarding our environment and intensifying it many times its original power. If an object or a human is placed inside, he becomes the recipient of this concentrated force

and is able to utilize it to benefit his daily life.

"The key to Pyramid Power lies in a form of electromagnetic radiation of short wave lengths called 'microwaves.' Where does all this 'biocosmic' power come from?

"Surrounded by vast electrostatic, magnetic, light and gravitational fields, we remain for the most part totally unaware of them and the effects they have on our bodies. Do you know that the pulsating magnetic field can increase enough to approximate that of the Earth? Although the electrostatic field is not felt by us, it is one of the most important factors affecting life: Persons exposed to elimination or decrease of this field suffer negative effects contributing to fatigue, irritability and apathy. Tests conducted by NASA show that under a favorable electrostatic field, all-around performance, work capacity, disposition, metabolism function and rate of burn recovery and healing were all improved, while pain and allergic disorders can be relieved.

"Our own senses remain extremely limited: We utilize less than 0.01% of the total light available. By contrast, the geometric shape of the pyramid acts as an antenna which soaks up this power, magnifies it many times over, and stores it for us to use. Not only can Dr. Flanagan duplicate Pyramid Power, but he has actually been able to photograph it by using Kirlian Photography, a process which captures on film radiations not visible to the naked eye.

"Since energy tends to discharge from sharp points in any energy system, it is not at all unusual that the power which is housed inside of the pyramid would flow from its apex and from its corners.

"In the 1960's, a team of scientists lead by a Nobel Prize Winner for Physics worked with 12 United States and United Arab Republic Agencies to analyze the structure of the Pyramid of Kephren. At the conclusion of the project, a correspondent from the London "Times" asked for and received this explanation:

"...there is some force that defies the laws of science at work in the pyramid."

"Using ultra-sophisticated technical equipment, Dr. Flanagan has proven that Pyramid Power:

- Helps people, animals, plants and things
- Can be obtained quickly and easily by anyone
- Can strengthen, energize and rejuvenate the body
- Can increase ESP

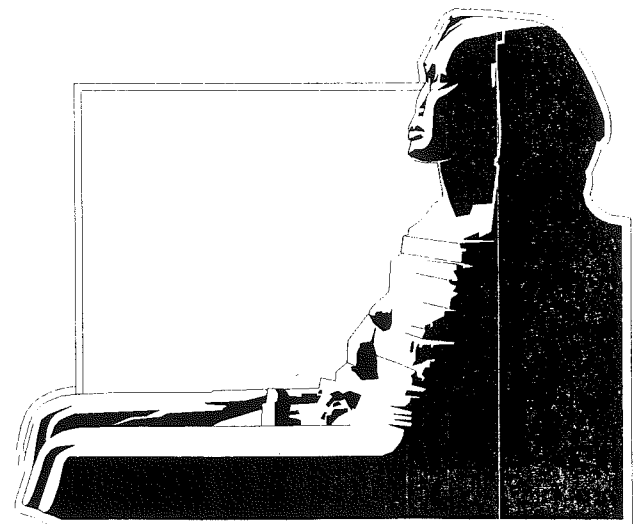
"When you enter a pyramid, you can feel the surrounding energy. All who have sat in ne report an intense feeling of heat along with a tingling sensation in the hands. Those who meditate or use biofeedback unanimously agree that when these practices are performed in a pyramid, the benefits gained are significantly increased. They feel that stress-related conditions, such as insomnia, chronic headache, fatigue, low back pain, can all be reduced; that daily tension, stress, and anxiety can be relieved; that they perform better on the job, increase self confidence, and suffer less depression--all of this to a far greater degree than if they were to meditate without the aid of pyramid power.

"Animal lovers disclose that their pets are healthier, live longer, and are free from fleas and ticks. Just plain 'lovers' experienced a definite improvement in their lovelife with increased virility and sexual sensitivity. Others reveal that they not only feel better, but also look younger, more attractive and appealing. One movie star sleeps with a miniature pyramid under her bed because it promotes sound sleep and makes her feel energetic.

"Pyramid Power can be absorbed and stored in ordinary tap water for consumption, thus discharging natural energy directly into the system. This same water can be used to treat the problem skin and acne suffered by teenagers. Hair shampooed with it is lustrous and manageable. House plants thrive when watered with it. They grow larger faster, become healthier (sickly plants are strengthened), and look greener. Even plant pests are repelled.

"And those concerned with the economics of their pocketbooks are justly rewarded: Enhance the flavor of less expensive brands; tenderize meat; mellow inexpensive wines so that they taste like vintage stock; remove the bitterness from coffee and tea; dehydrate foods for future use (meat, fruit, herbs, vegetables); freshen wilted vegetables and restore stale coffee; sharpen dull razor blades.

"Hobbyists can easily preserve butterflies, insects, etc. for their collections: dry fresh flowers and foliage for bouquets and arrangements.



Pyramid Power Projected

"Still in its infant stages, Pyramid Power is a scientific discovery which will ultimately prove to be equal or superior to electricity.

"Before his death Dr. Harold Saxon Burr, of Yale University, worked on the 'Blueprint for Immortality,' a special program to measure, balance and increase the energy fields around and in the human body so that many forms of disease can be eliminated entirely, the aging process slowed down, and the life span drastically prolonged.

"Pyramid Power has the potential to purify the polluted air and water of entire cities. An air freshener has already been developed for the home which makes the air 'like that of an alpine valley near a waterfall--perfect for optimum health.'

"Because this powerful force will lead us away from dependence on fossil fuels by providing an understanding of the true nature of gravity (a problem which the governments of the U.S. and foreign countries are desperately trying to conquer), the energy crisis will be greatly relieved.

"A huge, gleaming white pyramid-shaped office building now stands in the financial district of San Francisco. The interest of the entire construction industry was captured when a religious community in Houston, Texas erected its church in proportion to the Great Pyramid at Giza. In development stages are pyramid complexes to house whole Institutes and Centers in New York and California, as well as pyramid theaters, restaurants, homes and apartments throughout the country. Watch for them in days to come!

"We no longer need look only to the future for Pyramid Power. The article below will explain how you can begin immediately to put the Power of the Pyramid to work for you every day."

HOW TO GET YOUR OWN PYRAMID INEXPENSIVELY AS PART OF A RESEARCH PROJECT

"Dr. G. Patrick Flanagan, recognized as the world's leading Pyramid Power scientist, has unequivocally elevated Pyramid Power to the stature of a science. He has proven that Pyramid Power does exist and that it creates an energy flow capable of accomplishing countless beneficial and desirable results. These results have been thoroughly documented and verified by independent scientists and researchers the world over.

"But up until the present time Pyramid Power has been available only on an extremely limited basis. But because there is yet so much vital information to be gathered, Dr. Flanagan has, for the first time ever, made it available to the general public.

"Several years ago, in an effort to present the most complete picture possible, Dr. Flanagan and his staff initiated an Intensive Continuous Research Program. These scientists now wish to utilize the experiences, observations and comments of the average Home Pyramid...user. (Dr. Flanagan is the author of 'Pyramid Power', the original pyramid energy book in the USA.) He is currently in the process of collecting data for another, even more comprehensive book. Therefore, the Home Pyramid is now available to you at a special reduced rate. Additionally, if your name is chosen, you will receive an invitation to take part in this important project. Participation entails only several minutes of your time, and should you decide to do so, will automatically qualify you for special bonuses.

"The Home Pyramid is a lightweight, mobile unit scaled as an exact replica of The Great Pyramid at Giza. This is absolutely necessary in order to insure success. The base measures seven feet--the height measures four and one-half feet. Constructed of high quality, corrugated board tubing, this pyramid can accommodate people, animals, plants and things. Free standing, it is roomy enough to comfortably house two adults. Those who choose to sleep under it report a heightening of all feeling: sensual, physical energy, and ESP as well as reduction in aches and pains.

"The structure itself is uncovered. One of the most fascinating discoveries yet is that the Pyramid Power can be generated by an uncovered structure. IF the tubular framework maintains the accurately-shaped outline and precise proportions of The Great Pyramid at Giza. The Pyramid Power from within automatically produces an energy shield which serves the same purpose as a solid covering, yet the structure remains free of the restrictions and confines of a conventional pyramid or tent. Air, sound and light are free to circulate around you. IMPORTANT NOTE! It is only necessary to have the framework of a pyramid for it to function. It is not necessary for the sides to be closed. Also, if the sides were closed, sitting inside would become very uncomfortable.

"The Home Pyramid is completely versatile in its simplicity. It takes only minutes to assemble. Complete, easy-to-follow instructions and suggestions for its use are included.

"Pyramids before this cost anywhere from \$40.00 to \$200.00 because of the precision required and the expensive material involved. However, in order to get public feedback for further research data, the Home Pyramid is being made available through this special research project for only \$9.95. All Dr. Flanagan asks is that if anyone experiences exceptional benefits, would they please inform him by mail."

