

THE THINKER'S HANDBOOK

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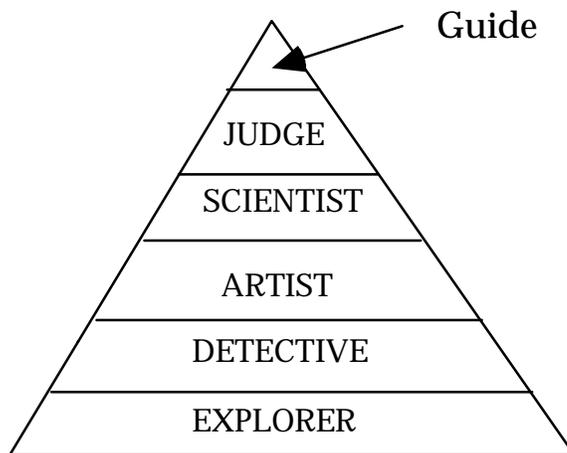
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1. Ascend the hierarchy, stage by stage.

Thinking does not occur in a vacuum. Thinking occurs when we categorize reality in a particular way, and then make inferences and predictions from our observations. We think “All men are mortal,” “Socrates is a man,” therefore “Socrates must be mortal” only because we have the concepts “Socrates,” “Men,” “Mortal,” and “Is.” Without concepts, deductive and inductive thought would be impossible.

Obviously, we must have facts and concepts in our heads before we can begin to think: consequently, good thinking relates to the following pyramid:



Thought occurs in the preceding stages:

Explorer

This is the first stage of thought. Here is where you gather the concepts and facts you need, without which thinking would be impossible. There are two ways to read a catalog: one, to look for what you need, and two, to just browse it. As the pyramid shows, *most of your time should be spent in this stage.*: it is the *foundation* for

future thought. When an Explorer goes into a library, s/he browses the shelves for interesting material. S/he goes into hardware stores looking for devices, even though there is no immediate need. Here information is gathered. The Explorer is *horizontal*; typified by the Liberal Arts education. A generalist.

These stages do not get equal time: rather, they are dependent on each other, and some should get more time than the others. Person should be an explorer 25% of the time, and the other modes are *dependent* on the person being an explorer 25% of the time. Bad: always looking for stock market information, because one wants to invest in stocks. Good: devoting X percentage of time to looking for information, while devoting X percentage to learning about reality in general. *The most important time is spent at the BASE of the pyramid.*

Unfortunately, we are discouraged from the Explorer mode. The typical way we are asked to write essays in school is “State your conclusion, then justify it.” This puts our frame of mind into the next stage, Detective. However, without the first stage, our judgments are likely to be flawed.

Detective

It is only after one has gone horizontal that one can go vertical. After you have explored the many avenues open to you, you may wish to burrow into a particular area. You may want to specialize in anthropology, playing a musical instrument, write a book on topic X. As a detective, you actively search for the pieces of a puzzle.

Artist

After you have explored, and then burrowed, you then have a vast set of concepts with which to work. It may involve applying old devices to new tasks. From these concepts you begin to come up with new concepts; you are what we term “creative”: you “brainstorm,”

come up with many hypotheses and new thoughts. These thoughts must then be tested for validity.

Scientist

Having invented your concepts, you now must put them to the test. If you do not perform formal experiments, you observe. If this is true, then this **MUST** be true. If it is not, it's back to the drawing board. Knowledge of how to test is crucial: change all variables but one.

Judge

You now have much material: all the information you originally gathered, the thoughts you have had about that information, and the verifications of your hypotheses. Now you weigh everything, and **REACH A CONCLUSION** based on the most probable interpretation.

Guide

Having done all the work necessary to reach legitimate conclusions (the most probable given all the available evidence), it is only then that you are ready to guide others: as Bernstein, to teach others. You cannot pave the way until you know the way to pave.

Unfortunately, most people invert the pyramid: that is, they spend their time telling others how to conduct their lives before they have done the necessary work. It's easy to see why: ascending the pyramid requires **TIME** and **EFFORT** and **MONEY**, and they want the icing before they have even prepared the cake. They recommend one restaurant out of thousands possible, because they went to that one restaurant and they liked it. Their conclusions lack credibility, because there is not enough evidence to support it. The Letters to the Editor in newspapers are filled with the "opinions" of people who frequently misunderstand, and who do not have enough information.

2. Reformulate loaded terms.

Frequently, when people attempt to convince you that a particular point of view is a legitimate one, they will use words that contain the point of view embedded within them. If one thinks with these terms, one cannot see outside the view; the terms provide the reference point. Small wonder people find it so difficult to change their minds. In the abortion controversy, for example, the people for abortions call themselves “pro-choice” and the people opposed to abortions call themselves “pro-life.” Is there anyone out there who is opposed to *life* or opposed to *choice*? No. But to the proponents of these contrary views, you are opposed to one or the other.

Here is some statistical evidence of the power of the loaded term in the area of “welfare.” On July 5, 1992 (p. L-16), the New York Times reported that a poll they conducted in conjunction with CBS asked a question regarding the level of spending for “assistance to the poor,”; approximately 66 percent of the public said it was “too little.” Then the question was immediately re-asked, but with one small change; the word “welfare” was substituted for “assistance to the poor.” This time, only 23 percent said the nation was spending “too little” on Welfare! With dramatic shifts like this in opinion achieved by the substitution of key terms, it’s easy to see why proponents of a point of view will use the formulation most favorable to their “side.”

Thinkers, however, aren’t interested in linguistic games: they are interested in seeing things as objectively as possible. The solution isn’t difficult. When someone gives you an argument with loaded terms, reformulate what they believe in neutral language, and pitch your discussion on that basis. Here are some examples:

A: You want to *impose* your system on the people.

B: I want the people to decide on a system for themselves. And it’s not “my” system, it’s “a” system.

A: We presented a balanced view.
 B: While you discussed two points of view on the issue, you devoted 15 minutes to one point of view, presenting only the evidence for that view, and one minute to another, presenting only the counterevidence opposed to that view. And you devoted no time at all to points of view three, four, and five.

A: She's a spinster.
 B: She's not married?

A: That idea isn't practical.
 B: The idea has been used elsewhere.

A: You do not recognize that I am correct.
 B: You have not shown that you are correct, so there is nothing for me to "recognize."

A: We raised the minimum wage.
 B: But when you adjust the minimum wage for inflation, it has actually dropped by 20 percent.

A: This brochure on why the subway service is poor just makes excuses.
 B: If they didn't communicate with you, you'd say "they don't communicate with their customers." When they do communicate the reasons for their bad service, you say they're "making excuses." How can they win?

These "arguments," shorn of their loaded terms, are revealed to be simply emotional exclamations of wish-fulfillment — the intellectual artifacts of, perhaps, few too many days in discussions with others.

- aa. Reformulations (reformulate1)
- i. "lets/allows" = gives the power to
 - ii. "can" = formulate as probability statement "The chances of X doing Y are ___ %.
 - iii. "I think" ==> x asserts that
 - iv. "only" ==> evidence? "The only ____ . My evidence for this is ____ ."
 - v. Essential = follow "my evidence" for this is ____ .
 - vi. "Wise" = I believe this because ____ . My criteria for "wise" is ____ .

- vii. (List words which need “my evidence for this” as a follow up.
- viii. His tool to ==> He was given the power to.
- ix. "Practical" ==> “My criteria is ____ . It is more practical than __, __, ____ . To me, practical is a more important value than ____ .
- x. "It's wonderful, the best ever. Not the best ever, but the best so far. I love it. I'm happy with it. I'm satisfied. It allows us to vote.”
- xi. Reformulate “probably” statements into “certainty” statements, if the probability level is given. Anything over 99.9% deserves to go into our mind as “certain.”
- xii. "Nearly perfect” just another way of stating “imperfect.”

3. Read key books.

There are books, and then there are BOOKS. One of the problems with the information explosion is that it is difficult to separate the wheat from the chaff. For every book which contains essential concepts, the alphabet of critical thinking, there are hundreds of books which do not. Here are several key books which have some of the concepts we need:

PSYCHOLOGY

***The Social Animal* by Elliot Aronson, Sixth Edition, (1999: Freeman)**

This book examines essential problems with human social psychology, including conformity, self-justification, prejudice, and aggression. Discusses many important experiments, including Milgram, Asch, and Zimbardo. Very easy to read, with many examples.

***The Act of Creation* by Arthur Koestler, _____**

How do people think creatively? Koestler sees creativity as a function of a process he calls *bisociation*, the clash of _____ .

***Inferno* by Dante _____**

While many people see this as one of the world's great works of literature, it is also has many keen insights into human psychology.

***Prisoner's Dilemma* by _____**

In case you were wondering why the world was so screwed up, this book provides at least one fascinating explanation. Knowledge of this very critical effect in game theory explains why it is so difficult to improve things. Explains disasters like Copacabana fire, the Wall Street Crash, the

Greenhouse effect, Nuclear Arms proliferation, wars, traffic jams, your noisy neighbors, and a host of other unpalatable aspects of reality.

LANGUAGE

***The Tyranny of Words* by Stuart Chase _____**

We take language for granted, but as Chase points out, the words are fuzzy, and we sometimes misunderstand the meanings of others. A valuable book.

***Metaphors We Live By* by Lakoff and ___ Johnson _____**

***Telling It Like It Isn't* by J. Dan Rothwell**

Hundreds of examples of language misuse and malpractice. Easy to read.

LOGIC: THE FORM OF THOUGHT

***Logic and Contemporary Rhetoric* by Kahane _____**

***Attacking Faulty Reasoning* by _____**

***Asking the Right Questions {?}* by _____**

***Rival Hypothesis?* by Huck and Sandler**

***Historian's Fallacies* by ___ David Hackett Fischer _____**

***Argument: A Guide to Critical Thinking* by _____**

***Liberty, Justice, and Morals* by _____**

FOOD FOR THINKERS: THE CONTENT OF THOUGHT

***The Practical Cogitator* by _____**

This invaluable book contains many key passages by some great thinkers, including Thoreau, Goethe, Pascal, Emerson, Twain, Montaigne, and many others. A way to find authors you want to read more of.

***Great Treasury of Western Thought* by _____**

An enhanced version of *The Practical Cogitator*, much more expensive, but far larger in scope. The mission of this book is ambitious: to assemble the key passages of the finest thinkers in Western culture, on the topics of *Emotion* (Fear, Anger, Jealousy, Pity and Envy), *Mind* (Memory, Imagination, Dreams), *Knowledge* (Experience, Truth, Doubt and Skepticism), *Ethics* (Conscience, Honest, Custom, Virtue and Vice), *Economics*, (Labor, Money, and Taxation), and many other topics. An excellent way to discover writers you'd like to read more of.

***The Heretic's Handbook* by _____**

Another valuable collection of insights, this time from what may be termed the "subversive" point of view (that is, views in opposition to that of the culture at large). A very mind-expanding collection.

***Zen Flesh, Zen Bones* by Paul Reps**

A collection of easy-to-read Zen tales, the Aesop's fables of Eastern philosophy. Gives a far different angle to thought than that provided by Western culture, and _____

***This Book Needs No Title* by Smullyan**

A philosopher of Logic as well as a student of Eastern philosophy, Smullyan manages to merge the insights of both in this collection of very simple tales which make, at times, some very profound points.

***Essays* by Montaigne**

Well-written essays on the topics of __ , __ , and ____, though modern-day readers may have difficulties with the language. Still, some penetrating thoughts.

***Essays and Aphorisms* by Schopenhauer**

Well-composed thoughts by one of the famous exponents of the Pessimist point of view.

***The Norton Lectures* by Leonard Bernstein _____**

While available in book form, this is much better acquired in video. Bernstein weaves a vast conceptual web that ties together music, philosophy, physics, poetry, and many other aspects of intellectual life. When it comes to teaching, nobody does it better. Valuable not only for its deep insights into music, but also into learning how to teach.

EDUCATION

***How Children Fail* by John Holt _____**

As a teacher, Holt _____. Explains many problems with the thinking processes of kids, and _____.

PHILOSOPHY

***Thus Spoke Zarathustra* by Nietzsche _____**

A work of philosophy? A work of literature? One of the world's longest poems? However you want to characterize it, few people have managed to compact so many brilliant thoughts cohesively as Nietzsche. For many people, this book will be tough going, with phrases such as _____ not easily giving up their meaning. Others will enjoy comments such as _____. Tightrope walkers, dwarves, and animals all play their role in this magnificent work, one of the many inspirations for Stanley Kubrick's *2001*.

***Walden* by Thoreau _____**

One of the qualities lacking from so much of modern fiction and non-fiction is the quality of *authenticity*: the feeling that the words one is reading is genuinely felt by the author. Thoreau is the champion of authenticity; honesty pours out of every page. Read this book and get into the mind of one of the great people of the last 200 years.

***The Romantic Manifesto* by Ayn Rand _____**

Though she is typically associated with the economic philosophy of Capitalism, Rand was also a passionate believer in the Romantic concept of Art. In this book, she brilliantly defends this view, and _____.

***The Art of Philosophizing* by Bertrand Russell _____**

A easy-to-read introduction to the technique of thinking by one of our ages most clear-minded philosophers. There are also many other excellent books by this man, including *Why I Am Not a Christian*, *Unpopular Essays*, and many others.

DEEP ANALYSIS

***The Making of Kubrick's 2001* by Jerome Agel _____**

This book explores Stanley Kubrick's masterpiece from nearly every conceivable angle. As the proofreader to the book noted in a quote on the _____ page, "_____. It's true.

***Puzzles About Art* edited by Battin/Fisher/Moore/Silvers**

An excellent compilation of well over 100 cases in Aesthetics, involving issues like the nature of art, beauty v. ugliness, interpretation, ambiguity, art in conflict with other values, and many others. Very easy to read, a superb non-intellectual introduction to intellectual issues

Abusing Science by Phillip Kitcher

Kitcher methodically explores the arguments between Creationism and Evolution. A superb introduction to the philosophy of science: how we can say that we know anything.

***How Real is Real?* by _____**

We t_____

***The Design of Everyday Things* by _____**

The author goes deep into an explanation of the poor design we find all around us: from phones that we can't figure out how to put on hold to doors that we must push that look like they should be pulled.

MEDIA ANALYSIS

***The Whole World is Watching* by Todd Gitlin, _____**

This book examines essential problems with human social psychology, including conformity, self-justification, prejudice, and aggression. Discusses many important experiments, including Milgram, Asch, and Zimbardo. Very easy to read, with many examples.

***The Myth of Soviet Military Supremacy* by Arthur Koestler, _____**

How do people think creatively? Koestler sees creativity as a function of a process he calls *bisociation*, the clash of _____ .

4. Expose yourself to key artworks.

While books contain many of the essential meanings humans need to be exposed to, they do not contain all of them: "the medium is the message." Here are masterworks from the fields of film, recorded music, and poetry. Expand your dimensions.

MUSIC

***Brahms Violin Concerto* Isaac Stern**

A work of philosophy in musical form. Stern understands the key message delivered by this piece. Should be the anthem of humanity.

***Pathétique Symphony* conducted by Leonard Bernstein.**

How do people think creatively? Koestler sees creativity as a function of a process he calls *bisociation*, the clash of _____ .

Sgt. Pepper's
Ummagumma
Islands

CINEMA

Who's Afraid of Virginia Woolf

Based on the immortal play by Edward Albee, this play has powerhouse performances by Richard Burton and Elizabeth Taylor. Not for the kiddies.

Eraserhead

This surreal epic by David Lynch puts us right into the world of Nightmare. Don't see it if you're depressed.

Swept Away

Lina Wertmuller's exploration of female master and male servant trapped together on a desert island. Explores many fascinating themes.

Citizen Kane

The film most-cited on critics' "All time best" lists, and rightly so. This is a superb textbook on how to make a film. Marries form and content brilliantly.

A Space Odyssey

On the surface, visual pyrotechnics paired with what on first glance appears to be an extraordinarily banal storyline. See this film, then read Agel's *making of Kubrick's 2001*, and then ask yourself if you really saw the film.

POETRY

Ariel

Sylvia Plath's final poems. Stark and haunting. Real poetry.

Rommel Drives on Deep into Europe

Richard Brautigan's _____ .

5. Think in terms of process.

The game of *20 Questions* is a simple one: you think of a person, and the other person has 20 questions to get the right answer. Simple, but play the game *20 Questions* with a novice, and you get failure after

failure. “Is the person Babe Ruth?” “Is the person Albert Einstein?” “Is the person William Shakespeare?” With tens of thousands of possible people, and only twenty questions, the novice is doomed to failure.

Contrast this approach with that of the *20 Questions* [pro]. The [pro] seeks to reduce, systematically, the number of people to be considered, from tens of thousands to thousands to hundreds to dozens to a handful. The [pro] begins with three simple questions: “Is it a man?” After getting a “yes,” the [pro] asks “Is he alive?” After getting a “no,” the [pro] asks, “Did he live in this century?” After getting a “yes,” the [pro] knows three things: The person is a man who died this century. With this knowledge, the [pro] eliminates tens of thousands of people. The [pro] gradually refines the set: “Did he die before 1950?” “Was he an entertainer?” “Was he a singer?” With twenty questions, talented [pro]s are able to get the answer the majority of the time.

Your thoughts should not be haphazard. Develop a system for thought, and stick with it.

Binary search

6. Verify.

When the manufacturers of the compact disc wanted to come up with a standard, they realized that the information alone wasn't enough. It had to be *oversampled*. That is, to be sure that the information we got was reliable, we had to test over and over.

This is an excellent rule to follow. The credibility of a statement is enhanced the more it is confirmed by others. If someone says “X is the case,” get the evidence. You find the information in that source. Now find it in another source. Now find it again. If a bureaucrat says, “you cannot do that,” ask another bureaucrat. *Never accept the first word as the final word.*

Related to this is the technique of *metaphorical reading*. It is one thing to simply read a sentence, and another to map it onto another domain. Some people read sentences within a text regarding topic X, and continually map the sentences from domain X onto domain Y. For example, suppose you read the following:

The complexity of the computer programs we write has grown faster than our ability to write them correctly.

By substituting terms, one can get new meaning:

The complexity of the ~~computer programs~~ *society* we ~~write~~ *create* has grown faster than our ability to ~~write them correctly~~ *deal with the problems*.

Here's another example (regarding the language FORTRAN):

It's not the last word in computing; on the contrary, it was one of the first words.

And a substitution, with regards to our Constitution:

It's not the last word in ~~computing~~ *government*; on the contrary, it was one of the first words.

Here we apply the lessons of domain Y to domain X. The first remark lends credibility to the second by providing a parallel from an entirely separate domain. It functions in the same way as does independent verification of an experiment (in science), or a test of type X which gives the same answer as a test of type Y (e.g., a vase dated 2000 bc, verified by carbon-dating and other experiments).

Without a good deal of reading, *and* the right kind of thinking approach, one cannot be exposed to this process of independent verifications, and thus one cannot fit the premises within a hierarchy of credibility. With this kind of thinking approach, one can get a massive amount of information out of a book, much more than is

actually present. This approach also suggests an explanation for intelligence; not a genetic ability, but an *approach to thought* which multiplies the significance of one's thought-time five-fold, by bootstrapping thought.

Some texts are more “mappable” than others, and are more valuable because of this. One criteria of great art might be its “mappability” — or what can be done with a given text — the verifications it can provide in vastly different domains.

True of artworks, and true of individual words. The power of metaphor is that it maps onto so many domains; and in so doing, lends credibility to all the others. A metaphorical remark is one which links together a number of experiences not formerly thought of together. The following remarks have this quality:

The pyramid is wider at the base.
Forts have a way of becoming prisons.
The thread is gone.
They're shooting at decoys with blanks.
Without a safety net, you won't walk the tightrope.
They're angels because they have wings.

7. Look for alternative interpretations.

In the album *Sergeant Pepper's Lonely Hearts Club Band*, there is a line referring to “4000 holes in Blackburn Lancashire.” Since there are so many other references to drugs in the album (*Lucy in the Sky with Diamonds* = LSD, *Henry the horse* [“horse” = slang for heroin]), some have said that the reference refers to junkie's needlemarks. This interpretation is consonant with the interpretation on the rest of the album. However, the actual quotation was taken from a newspaper article referring to the holes in the road — potholes. And there is another metaphorical interpretation, since another song refers to a person “fixing a hole” — perhaps referring to filling a void in one's life. Some other alternative interpretations:

- A: Ted Williams was the best hitter.
B: Are you referring to batting average or slugging percentage?
- A: I read a story, and in that story a character unbundled sheaves of sticks to break them. The moral is, “unite and be strong.”
B: I thought the moral was “break down a complex problem to solve it.”
- A: Different bedtimes for children is a double standard.
B: The children are different ages, and there is one standard: this is your bedtime when you are 5, and this is your bedtime when you are ten.

It may be that one’s “interpretation” is probably the only interpretation one is capable of conceiving given his frame of mind. Not to say this conception is inaccurate; only that one was the right person for the job. We think “Oh, how smart X was — how did he see it?” — and yet it was all he *could* see. Yet, of the thousands of people who saw it, only he could find that meaning. Good interpretation is less an intellectual feat than it is a meeting of the minds. We ask, “how do they see all these things in film, theater, etc.?” But when we examine closely, each “they” is seeing only that which he can see. Imagine a film in Russian, German, Italian, French, Swahili, etc. Over 50 different languages, none of which you speak. You are seeing the film in a room with fifty people, each of whom speak one and only one language spoken in the film. When you ask each what occurred in the film, each will explain that part of the film he (and only he understood), and only that part of the film. You are impressed by their “intelligence,” when you ought to be impressed that there was such a perfect fit between these two disparate mental frameworks.

8. Explore variations on a theme to discover new meanings.

Sometimes by reversing, shifting, comparing, smashing, and otherwise altering ideas, we get new, even more significant meanings. It's a useful exercise to substitute terms, and/or to take the form of x and the content of y. Proverbs are perfect for this purpose. As an example, start with "Inside every fat person is a thin person trying to get out." Then take another proverb: "Behind every successful man is a woman." When you combine the two, you get "Behind every man is a woman, waiting to get out." A new C is derived from A and B, at bottom what occurs in the creative process. In still other cases, one need only negate key terms to get new, equally significant meanings. Here are some other examples of variations:

The lady doth protest not enough.
Put your mouth where your money is.
If you do the time, do the crime.
Might makes wrong.
The salmon doesn't change his spots.
The most mediocre of all possible worlds.
Fight fear with fear.
When you vote for the lesser of two evils, you get evil.
It's hard to make your garden grow with a cloud over your head.
You can't keep your chin up with your nose to the grindstone.
Use six words where six words will do.
Don't let exceptions be your rule.
Evasions speak louder than words.
He who irritates is lost.
Resist the path of least resistance.
Your lack of knowledge is their power.
What you don't know can kill you.
Angels rush in where fools fear to tread.
In the country of the blind, the one-eyed man is reviled.
Some go out on a limb, others chop down the branch.
Many are called, but few show up.
This land is not your land.
You get what you don't pay for.
They slip us into something uncomfortable.

Don't feed the hand that bites you.

9. Quit your job.

Yes, of course you're not going to quit your job — BUT! Everything has a price; and while your job provides a steady, necessary paycheck, this paycheck isn't free. You pay for that paycheck. Here are some of the hidden costs of your job:

It changes your consciousness

You no longer think the same way.

It robs you of your time to think of others

You no longer think the same way.

You get mired in office politics

You no longer think the same way.

It supplies its own set of anxieties

You no longer think the same way.

It puts you into a non-intellectual culture

You no longer think the same way.

It tires you out.

You no longer think the same way.

Since the failure to work in this culture can be hazardous to one's health (homelessness, starvation), the chances of anyone taking this advice without visible means of alternative support is unlikely. However, one can at least be aware of the true costs of one's means of support.

10. Do not conclude that your first view is the correct view.

One of the many benefits of playing Chess is that game after game, you learn the same lesson over and over: the first move that pops in your mind is invariably not the best move. In retrospect, this isn't surprising: with thousands of moves possible, you'd have to be very

lucky or very brilliant to choose the *best* move the first time out — or even a very good move.

What's true in chess is true in other areas of life. Our tendency is to think that our first view of reality is the correct one. However, this is not necessarily the case. Consider these examples:

The notes were sour because the seam split.

Stix nix hix pix.

Don't sit in the applejuice seat.

Colorless green ideas sleep furiously.

Monty Hall problem.

11. Find the meaning beneath the surface.

Hal, IBM Hat shop. Finnegans Wake Hidden agendas

11. Utilize a credibility sheet.

All too often in conversation, the unsupported and unsupportable statements fly. People will say with no hesitation that they would never put in writing. When someone says to you a statement like "We fought the war to make the world safe for democracy," or "there is no better economic system than ours," present the person with the following credibility sheet. You may never use this sheet, but hopefully it will illuminate some of the issues involved here.

CREDIBILITY SHEET

When I say " _____ ", either a claim I have as yet not supported with any evidence, or a fact which I have not referenced to any primary or secondary authority, or an abstraction which I have not anchored to any concrete reality, I [DO/DO NOT] simultaneously assert that this [claim/fact/abstraction] is, in and of itself, either necessary and/or sufficient for the proper evaluation of the immediate proposals being considered (pro and con), or similar proposals,

and/or that it is a legitimate way of viewing or categorizing reality, and/or that it gives the point of view any degree of legitimacy.

[If "DO" is selected, the following is to be answered]

My EVIDENCE for the claim is derived from [the things I learned growing up at home/in school], AND from the following [books/magazines/newspaper articles/ college classes/treatises/law review articles/fictional television programs/nonfiction television programs[television news shows(with expert commentary/ with the commentary of government officials/with the commentary of representatives of political parties/with the commentary of everyday citizens who have been adequately informed of all the facts)]/films/documentaries]: _____ , AND after _____ [minutes/hours/days/months/years] of [cursory/ careful/extensive] [analytic/synthetic] independent thinking on the subject, and ____ [minutes/hours/days/months/years] of [cursory/careful/extensive] [synthetic/analytic] evaluation of my own thinking, which was, in both the former and latter cases, free (to the best of my knowledge) of the following logical fallacies: [begging the question/loaded term/straw man/equivocation/analysis within single frame/circular reasoning/illicit contrast/argument by innuendo/argument by abstraction/distinction without a reasonable difference/fallacy of composition/fallacy of division/is-ought fallacy/wishful thinking/fallacy of the golden mean/inference from a label/contrary-to-fact hypothesis/causal oversimplification/post hoc ergo propter hoc/ad hominem/tu quoque argument/ distortion/unrepresentative statistics/red herring/Von Domarus reasoning/other], the definition of all the foregoing which I am fully cognizant of, with the exceptions of the following: _____ , to the extent that I am able to give an example of each and point out their fallacious character; such thinking being free of any unsupported premises, with the following exceptions _____ ; AND, that this EVIDENCE meets the following standard: [preponderance of the evidence/beyond a reasonable doubt].

This EVIDENCE is RELEVANT because ____ . I [know/believe] that there are [no/few/many] rival [hypotheses/criteria/evidence] that [is/are] [possible/probable/actual/legitimate] that would [throw into doubt/refute] [my assertion/the legitimacy of my assertion in the overall context of my argument] or my [stated/unstated/implied] assertions that this was [necessary

to/sufficient to/both necessary and sufficient to/sufficient but not necessary to/necessary but not sufficient to/the only way to/the best way to/] view reality accurately, and to reach the proper decision in this matter.

I [am/am not] aware of any contradictory evidence that would throw into doubt the legitimacy of this point of view.

Of course, few, if any people, would be willing to fill out a form like this. That's precisely the point. Now you can assign their statements the credibility they deserve.

12. Look out for the seven deadly words.

There are many words used in everyday conversation which are seemingly innocuous, but in actuality are fraught with peril. Here are the seven deadliest. These words are “flag” words: when you hear them, the flag should go up!

1. The

This commonly used word, seemingly innocuous, is one of the deadliest. There are three problems with this word, with reference to the statement “The X was a ____:

- 1) It indicates that there *is* an X. For example, the statement “the Unicorn ate out of my hand” states that there really is an entity known as a unicorn, though this is false. (“The Unicorn ate the grass.”)
- 2) It says there is *only one* X. “The killer fled.” But there was more than one killer!
- 3) It conveys the notion that *this* is the X, even though this may be false. “The killer ate his last meal.” However, he was not the killer — he was wrongly convicted.

Note that the heading of this section is “*the* seven deadly words.” But are there only seven? Don’t let the use of the word beg the essential issue: presentation of *evidence*. When you hear the word “the,” your ears should prick up.

Consider the following phrase:

The five major components of content reading are . . .

One way to improve it is the following:

The Five ~~major~~ components of content reading are . . .”

4. Is

We typically hear, “this is that.” But there are many problems:

- 1) The “is” statement is frequently not coextensive. When we say “2 + 2 is 4,” we are saying that the meanings on both sides of the word are *identical*. But this is not always the case: for example, when we say “a dog is an animal,” we are not simultaneously saying that animals are dogs. This is because the class *dog* is a subclass of the class *animal*.
- 2) It leaves us prone to the Von Domarus error: “he is a communist.”
- 3) Like the word *the*, it assumes what must be proven. “He is the killer.” But if he is not the killer, then the *is* begs a very significant question.

3. Or

This word will frequently paint a false picture of reality by indicating that there are *only two* alternatives, when frequently there may be many more. For example, during the Vietnam war, one might have thought “I must serve or go to Canada.” This excluded the possibility of staying at home, protesting, and/or going to jail. When people are depressed, they frequently fail to see “a way out,” and start thinking in terms of only two possibilities.

It may be that when you hear this, one should think “or something else,” “or both,” or neither.”

You are mature or immature. You may be mature with regards to x, immature with regards to y.

2. Can

When a word covers every possibility from one over infinity to infinity over one, you know you have a problem. The word “can” makes mountains of molehills, and molehills of mountains. The word “can” covers such a wide scope of possibilities it is virtually useless: “the sun can rise tomorrow,” “I can win the Lottery,” “I can be President,” “you can buy your own home” all contain varying degrees of probability hidden by the term.

Here are some pertinent (impertinent?) *can* observations:

- 1) With regards to Las Vegas: you *can* win, but they *do* win.
- 2) Both the typewriter and the computer *can* produce a manuscript. Should the author buy the typewriter because it's cheaper?
- 3) Slavery could be justified with a “can” test: i.e., don't pass test, you become a slave. Complain? You should have studied harder.” Or, “you can escape,” so it's your fault.
- 4) You *can* survive a crash without a seat belt. Therefore you needn't wear one.

Consider the following pleasant dialogue:

A: We should have elections.

B: No we shouldn't.

A: Why?

B: Because a terrible thing could happen: Charles Manson *could* run against Jeffrey Dahmer, and one of them would take office.

A: Well, that certainly would be a terrible outcome; however, it is an absurd contingency.

B: Absurd? Are you aware of any law of physics preventing that contingency?

A: No.

B: Then it *could* happen.

A: Certainly.

B: And the policy you're advocating *could* lead to a terrible outcome.

A: Yes, I suppose it "could."

B: *Quod Erat Demonstrandum.*

Whenever you hear the word "can," you should formulate as a probability statement.

It's not "*can*" he get a job?" but "what conditions need to be present before getting a job is possible?" and "have those conditions been met?". There are necessary conditions: Job available, has training necc. for job, knows of job, they want to hire him. Sufficient conditions: he is offered job.]<== Some people see this, see necc. as suff. condition, say "why isn't he working?" It's his fault.

Some people read their fears into your possibilities.

5. Too

As in, "you are too nervous." The word not only conveys a value (too much of a thing), but implies that this judgment is solid — objective — concrete. It may be that I am not nervous enough!

6. Cause

When one talks of "the" cause, one assumes that there is only one cause. However, what we see as a *cause* is frequently just a *factor* in an occurrence. "This straw was the cause of the camel's back's breaking." Actually, without the preceding ten thousand straws, this final one would have had no effect.

7. If

"If only everyone would donate an hour a day of their time to social causes, the world would be a better place." True enough, but it ignores the Prisoner's Dilemma effect (see Maxim ____). *If* all the people had not tried to take their money out all at once, Roosevelt would not have had to declare a bank holiday. However, the nature of the dilemma is such that

once one person breaks, and another follows, one had best head for the vaults, and fast. The stampede is about to begin.

Of course, the above words aren't the only deadly words. There are many others, including *let* ("This law is good because it lets the Army put Japanese in internment camps."), *not* ("The court has not hesitated to prevent abuse of power by the other branches."), *no* ("There are no reasons."), *should* ("You should be a better person."), *opposite* (What is the opposite of the statement "X is Y.": "X is Z?" "X is not Y?" "That which is not X is Y?" "Y is X?"), *will* ("Nixon will be our next President."), *only* ("There is only one way to proceed."), *recognize* ("I am glad you recognize that Billy Ray Cyrus is the finest singer in country music."), *which* ("Which is the correct answer?"), *best* ("Fritz Lang was the best director of silent films."), *why* ("The fact they had strong beliefs is why it would have been better if the Nazis had won."), *they* ("They are the problem."), *we* ("We are superior."), *sure* ("I cannot be sure your plan will work."), and finally, *may*, a sister to "can", i.e. they buy lottery tickets because they "may" win, and they vote for incumbents because they "may" balance the budget. Don't fall into this verbal trap.

56. Understand that the medium is the message.

The thoughts we think are only as good as the information we think with. But the basic information we think with does not magically pop into our head; we must be *exposed* to it, whether we read it, see it, or hear it. Unfortunately, there is no such thing as the perfect medium; each has its pros and cons, although some, obviously, have far more legitimacy in others. Here, in rough ascending order, are the various media, and what a thinker can expect to get (or not get) out of them:

1. Sports Program

PRO

Entertaining. Good way to “veg out” after a hard day’s work. Can relieve depression.

CON

No reading involved. Little exercise of imagination, practice in understanding and evaluating the written word. Chews up an enormous amount of time that could be spent more profitably in other areas. Few, if any, new concepts. Fosters anti-intellectual culture.

2. TV Sitcom

PRO

Entertaining.

CON

No reading involved. Little exercise of imagination. Time thief.

3. Comic Book/Strip

PRO

Entertaining. Good reading material for people to practice reading. Provides pictorial schema for verbal reality.

CON

Very little useful information. Repetitive storylines, formula plots.

4. Tabloid

PRO

Entertaining. In that respect, good reading material for people to practice reading. Excellent source of logical fallacies. Provides excellent counterexample to popular belief “they can’t print it if it isn’t true.”

CON

No footnotes. Stories, such as “Elvis Alive on Mars,” spun out of pure fantasy.

5. Fiction Book

PRO

Fun to read. Helps one keeps up one’s reading skills. If the book is “literature,” can exercise the higher critical faculties.

CON

You are taking in information which is, by definition, not true. This is time spent away from taking in information which *is* true.

6. Political Cartoon

PRO

Conveys complex ideas quickly. High accessibility. Cuts through to the essence of certain issues.

CON

Can oversimplify complex issues; not a substitute for reasoned analysis.

7. Radio/TV Talk Show*PRO*

To the extent that it is issue-oriented, sometimes a good source of basic facts. Good introduction to issues you had not formerly been aware of. High accessibility. Passion of callers conveys intensity and significance of the issues. To the extent you are allowed to call in, allows for two-way communication.

CON

When broadcast from one point of view (i.e. "right-wing"), a source of disinformation. Unlike fiction, the promulgators of false information do not advertise that they are broadcasting falsehoods. You take in as "true" what is "false." In addition, parties with hidden agendas leave out much counterevidence. Provide false framings of true information. Source of much heat, little light. No footnotes, so no way to check on the accuracy of the information presented.

8. Computer Bulletin Board*PRO*

Very little editorial control. Consequently, you are free to post virtually any information you choose. You can expose thousands of people to your point of view. Allows for two-way communication.

CON

Very little editorial control. Consequently, anyone can post virtually anything they choose, leading to at least three consequences: 1) A flood of information that can never be absorbed. 2) Very little integrity of information; rarely do posters footnote their posts, so a great deal of disinformation. 2) Because there are so many decoys, it is difficult to find the ducks.

9. Television News Show*PRO*

Conveys facts quickly. If documentary/investigative in nature, very high impact. Conveys significance very well. Information very up-to-date.

CON

Dozens of filters on information presented (e.g. advertisers, stockholders, vice-presidents, managers, editors, writers, camerapeople) homogenizes what's presented. Many photo opportunities of "the President," little deep analysis into the roots of issues. Incredible power of TV to frame issues in a particular way, to set the agenda, leading to potential hegemony by an elite upper class.

10. Magazine

PRO

Conveys facts and concepts quickly. High accessibility. Can explore topics in depth. More current than books.

CON

Less current than newspapers. Editorial content highly influenced by advertisers. Long lead-times can lead to out-of-date information. No footnotes = low information credibility.

11. Newspaper

PRO

Conveys facts and concepts quickly. High accessibility. Can explore topics in depth. More current than books and magazines.

CON

Less current than television news. Editorial content highly influenced by advertisers. News typically sent through a "slant" which alters the credibility of information.

12. Conversation

PRO

Perhaps the most involving of the media: "fun." Information and the being can become one. Two-way, ongoing nature means that one's thoughts get "aired out," allowing others to point out mistakes, help you get off the wrong track. The contradictory ideas are recent, providing radical framebreaks: "Oh, now I see what you mean!" Sometimes you think excellent thoughts during a conversation.

CON

Like tennis, the "game" is only as good as the person you are involved with. Remarks made to some people fall flat, like hitting a tennis ball into a mattress. Can revolve around non-intellectual issues, thus wasting time. Can degenerate into "argument," where more heat than light is generated.

Can degenerate into egocentric discussion of what “I” did, think, etc. Fast-paced nature means sometimes people “say what they didn’t mean.” Difficult to think on one’s feet, sometimes forget to bring up important points. No footnotes means low integrity of information.

13. Journal Article

PRO

Heavy footnoting provides high integrity of information. Excellent bibliographies provides sources for future research. Authorship by professionals in the field of inquiry leads to deep analysis of issues, avoidance of old mistakes.

CON

Technical nature of articles means low accessibility for those not trained in the field. Short length provides only cursory background. Current paradigms of the field can restrict topics discussed to that which are “fashionable.”

14. Nonfiction Book

PRO

Heavy footnoting provides high integrity of information. Excellent bibliographies provides sources for future research. Long time in preparation means extensive, thorough analysis of the topic. Length means time to develop an argument, to introduce reader to issues. Lack of advertisers means higher integrity of information. In conjunction with other books in the field, can provide as complete a view of the field as can be attained. Author has excellent control over style of presentation. Essential source for essential concepts. Lack of readers means greater freedom to present alternative points of view.

CON

Length of books intimidates potential readers, exhausted after “a hard day’s work.” Perceived as technical by some.

15. Idea Book

PRO

The only way for thinkers to evaluate their own thoughts; by writing them down, and then examining them later after they have more information. The method used by thinkers like Joyce, Beethoven, and Wittgenstein, among many others, to keep a permanent record of their thoughts.

CON

Used by few.

A key message of the above analysis is this: ask yourself what media you are most frequently exposed to. If you spend little time in the last four areas, you are not being exposed to the most significant sources of high quality information. And what comes in, goes out.

13. Be counterfactual.

Suppose someone says to you, “I will give you numbers that follow a rule. Your job is to discover the rule by giving me groups of numbers that you believe will conform to the rule. If your group does conform, I’ll say ‘yes,’ and if it doesn’t, I’ll say ‘no.’ The first four numbers are 3-6-9-12.”

You see 4 concurrent numbers that increase by 3, so you immediately guess that the rule is “four numbers which increase by threes.” You then make three more guesses, as follows:

EXAMPLE #	EXAMPLE	ANSWER	GUESS
1	3-6-9-12	"Yes."	Any four numbers which increase by 3s.
2	0-3-6-9	"Yes."	Any four numbers which increase by 3s.
3	12-15-18-21	"Yes."	Any four numbers which increase by 3s.
4	30-33-35-38	"Yes."	Any four numbers which increase by 3s.

You now have four confirmations of the rule, so you very confidently pronounce “The rule is 4 numbers which increase by 3.” You are sure you are right. But . . . oops! You’re not! The rule actually is, you are informed, “any group of four numbers.”

What was your mistake? You failed to come up with examples which would *disprove* your rule. If you had said, “2-4-6-8,” and gotten a “Yes,” you would have seen that your rule was wrong.

Unfortunately, people have a strong *confirmation bias*: they are more likely to make guesses that confirm their point of view, as opposed to *disconfirm*.

Ridding yourself of this bias is critical if you are to be a competent thinker. It is not enough to look for confirming evidence; one must be *counterfactual*; that is, one must try to get a “yes” to a contradictory idea. If, for example, you guess “collie,” “dachshund,” “terrier,” and “poodle,” and get “yes” answers to all four examples, don’t be too sure the category is “dog” until you also test examples that don’t fit into the category. If you guess “siamese,” and get a “yes,” then you know the category isn’t “dog,” but may be “household pet,” or even “four-footed animal,” or “animal.” Further testing will help you increase the probability that you will be right.

17. Use key questions frequently.

One of the thinker’s greatest tools is the QUESTION. A question is a particular kind of remark made by people when they want to 1) get more information 2) Clarify issues. Questions are tools for getting information, and questions help set the frame. For example, to demand a “yes” or “no” answer to a question that demands a balancing approach is to preclude the proper way of viewing the world’s problems. (“Should a drug that benefits 99 percent of the people but injures 1 percent be banned from the market?”)

- b. Good Questions¹ (get questions from 6597-99) (See also work already done in this area: check the archive on Syquest).
- i. **If our nation is truly “a nation under God,” then shouldn’t we (logically) say “amen” after saying the pledge of allegiance?**
 - ii. **Policeman tells suspect to “shut up.” Can the suspect make a citizen’s arrest of the policeman, who is breaking the law? (Breaking the law of the Constitution). (cf. inconsistency, double standard).**
 - iii. **If Agenda A, B, C, D, E, and F is necessary for a good society, and party X advocates A, B, and C, and party Y advocates D, E, and F, how can the right combination ever be put into place?**
 - iv. **The following statement was made in one of the following years (we don’t know which): 1951, 1958, 1961, 1966, 1972, 1979, 1981, and 1988.: “The U.S Dept. of Defense needs \$300 billion. If it doesn’t get it, the Russians will know we’re weak and take over.” Is the amount overstated, understated, or exactly right?**

Reframe statements as questions

What would it take to convince you?

What does that say to you?

Are you viewing that hypothesis as a fact?

Those are the risks — now what do you think are the possible benefits?

What do you mean?

How do you know?

Are you sure?

Suppose that . . .

Why?

Why not?

What would you say if I told you that . .

So?

How does that follow?

Any other reason?

But what would you do in this circumstance?

Have you examined alternatives? Analyze your conversation

Is it really true that . . .

What’s your evidence?

“America is the best country.”

“UFO’s exist.”

“The death penalty does not deter criminals.”

“Marijuana is a useless drug.”

“The Yanks will win the World Series this year.”

“What makes you say that?”

“How about this . . . “

Is there another hypothesis?

Have you considered alternatives?

How?

Don't you think that . . .

How sure are you?

Could you be more specific?

“Those experiments are flawed . . . “

“How are they flawed?”

poorly done

disanalogous

never replicated

contrary studies

What is the most serious criticism you have?

a. “X is the case.” ==> Is it?

b. “There were three murders.” ==> How does he know?

c. “He was funny.” ==> What do you mean by funny? Funny to whom?

d. “The evidence is this.” ==> What evidence has he left out?

e. “Poor people are lazy.” ==> Why are they lazy?

f. “X because Y.” ==> Is there really a causal relationship?

g. “A,B,C,D.” ==> Is D relevant?

17. Use key statements frequently.

“IT SEEMS TO ME . . . “ OPENERS

“MAYBE.”

“I DON’T THINK IT’S LIKELY THAT . . . “

“I DOUBT YOU’VE SHOWN . . . “

Might stress at the beginning of public discussions that people should change “it can’t work because . . .” statements to “I think there’s a problem with” statements.

“THAT’S A LIKELY/UNLIKELY/INTERESTING HYPOTHESIS.”

“THAT’S NOT LIKELY.”

“I HADN’T CONSIDERED THAT BEFORE.”

“I’M NOT SURE YOU CAN DRAW THAT ANALOGY.”

“THAT’S A SEPARATE ISSUE.”

“I’M NOT SURE.”

“I THINK SO.”

“I DON’T THINK SO.”

“PERHAPS.” PUT STATEMENTS AFTER THE

“PROBABLY.” COMMENT THAT WOULD

“POSSIBLY.” INSPIRE THE REPLY.

“THAT’S IMPOSSIBLE.”

“I COULD BE WRONG.”

“I HAVEN’T ANALYZED IT THAT CLOSELY.”

“I DOUBT IT.”

“THAT’S DIFFERENT.”

“THE TWO CIRCUMSTANCES ARE FUNCTIONALLY IDENTICAL.”

“THAT’S NOT A NECESSARY FACTOR.”

“THAT’S NOT A SUFFICIENT FACTOR.”

“THAT’S NEITHER NECESSARY NOR SUFFICIENT.”

“LET ME GIVE YOU AN EXAMPLE.”

“LET ME GIVE YOU A HYPOTHETICAL.”

WHY?

“YOU CAN’T CREATE A BETTER SOCIETY.”

“THAT’S IMPOSSIBLE.”

“YOU HAVE TO DO THIS BY HAND: YOU CAN’T USE THE COMPUTER.”

“WE’RE NEVER TO GET A FAX MACHINE FOR OUR HOUSE.”

“IN LIGHT OF THE FACT THAT . . .”

“TO A CERTAIN EXTENT . . . “

“YOU’RE BEGGING THE QUESTION.”

“YOU’RE EQUIVOCATING.”

“THAT HASN’T BEEN DEMONSTRATED.”

“LOOK AT IT FROM THIS POINT OF VIEW . . . “

“YOU’RE CONFUSING EFFECTS WITH CAUSES.”

“THAT DOESN’T ANSWER THE QUESTION.”

“I’VE GOT TO THINK ABOUT THAT.”

“THAT HAS POSSIBILITIES . . . “

“THERE MAY BE ANOTHER WAY TO INTERPRET THAT EVIDENCE.”

“WHAT MAKES IT _____ “

“I’VE NEVER HEARD THAT.”

“HOW CAN I TRUST YOUR JUDGMENT? YOU NEVER FINISHED COLLEGE.”

“IT CAN’T BE A GOOD MOVIE. BOTH SISKEL AND EBERT HATED IT.”

NOTE THAT “SO” IS BEST APPLIED WHEN “NEVER” STATEMENTS ARE USED

WITH SKIMPY(OR NO)EVIDENCE.

“NO ONE HAS DEMONSTRATED THAT CONCLUSIVELY.”

“SOME EXPERIMENTS HAVE SHOWN THAT . . . “

“YOU HAVEN’T CONVINCED ME THAT . . . “

“YOU’VE MISINTERPRETED WHAT I SAID.”

“I’M INCLINED TO SAY THAT . . . “

“IT MAY BE THE CASE THAT . . . “

“I’D LIKE TO THINK THAT ISN’T TRUE.”

“YOU LEFT OUT . . . “

“NOT NECESSARILY.”

“IF . . . THEN.”

“BUT FOR . . . “

THE SET OF SUSPECT REMARKS(NOT TO SAY THAT THEY’RE IRRATIONAL IN EVERY INSTANCE)

“AMERICA IS NUMBER ONE.” CLOSERS

“WE’LL NEVER DO X . . . “

“THAT WOULD BE TOO EXPENSIVE.”

“WHAT ABOUT YOU?”

“BUT YOU . . . “

“THEY’LL BE ALLRIGHT.”

“THEY’LL GET USED TO IT.”

“WHAT ARE YOU DOING ABOUT IT?” (THE “YOU” REMARKS)

“IF YOU DON’T LIKE IT, LEAVE.”

“WE DON’T HAVE THE BUDGET FOR IT.”

a. Sometimes they don’t. Sometimes they have decided to spend the existing money on some less justified purpose.

c. Questions -- HOW to ask questions.

d. Socratic Method

- i. To those that claim “animals don’t feel pain,” ask “do dogs see?” Ask how they know. “Do dogs have a preference for one food over another?” Ask how they know. Apply to pain.

e. Submerged questions

- i. Questions which have occurred to your, perhaps not brought to the surface, and buried in the subconscious.
 - a. Why is there no Channel One on the TV dial?

f. General Questions

- i. Don’t give liars the opportunity to lie. (a potential hazard with the socratic method).
- ii. Questions borne of enthusiasm.

III. GIVE KID A CLAIM — TO EACH CLAIM HE MUST “BLACK-HAT” (WHITE HAT?). IN OTHER WORDS, ASK AT LEAST ONE QUESTION, MAKE AT LEAST ONE REMARK WHICH CHALLENGES THE FACT: CAN HAVE MULTIPLE CHOICE TEST. -- MATCH STATEMENTS TO QUESTIONS (CAN ALSO BE PUT UNDER THINGS THINKERS KNOW).

h. “X means Y.” ==> Is there another interpretation?

1. Move from local to global focus.

Don’t think *micro* — think *macro*! Psychological experiments have shown that *vividness* and *recency* effects are inherent distortions of the thinking process. Because car crashes are more vivid, people feel that there is a greater chance of being killed in a car than dying of a heart attack [check]. These are forms of the availability bias.

Forest v. trees.

There are several locals for every global (global = diamond, local = facet).

Unfortunately, people involved in local pursuits tend to have a local character to their thinking. The more concrete your job, the more concrete your thinking: the more local. A person who saws logs sees the immediate trees; a forest ranger sees the fire coming from three miles away. In the same manner, to a person, it's just a big piece of chocolate cake; to a doctor, it's a cause of heart attacks.

These biases give our thoughts a predominantly local tone.

Too many people try to prescribe local solutions for global problems. They want to fight crimes by passing more laws and putting those criminals away. But this approach does nothing to address the underlying causes. If problem is global, solution should be too

Increase in imagination ==> Ability of global view to compete with local view.

If you find yourself thinking "how can I help my friends?," "how can I help my family?," you are thinking locally. Ethnocentrism, identification with a subculture, guarantees that there will always be intercultural conflicts. Local thinking doesn't worry about the guy pouring sulfuric acid into the other side of the pool; the global thinker knows that eventually that acid will work its way over to this side. The local thinker pickets the source of discontent; the global thinker spends her time in attempting to buy satellite time to broadcast her message on a national basis. Local thinkers attempt to get their bill passed through Congress; global thinkers work to seek a constitutional convention to change the legislative process to make the passage of bills less inefficient and corrupt.

1. Be aware of the lessons of information theory.

If you've ever made a copy of a copy of a copy, whether paper or audio or videotape, you become aware of the salient fact that reproduction leads to degradation. In the analog domain, every copy has information loss; eventually, the loss is so great that little remains of the original.

One of the problems with "gossip" and rumors is that people are notoriously poor information reproducers, dropping out and adding details with each broadcast of the story. The distortions produced by people talking are compounded by the distortions of people listening. People say what they want to say, and hear what they want to hear.

If you want fidelity, go to the primary source. Too often, we will not read the original, but only a description or commentary. We think that our teacher's analysis of Hamlet *is* Hamlet, but unless you read the play, you're not reading the play. People will tell you about the evil thoughts of Karl Marx, but how many people have actually read his books? Until the books are read, no informed statements can be made, pro or con. Yet people are satisfied with their opinions, opinions derived from no_____.

Go to the source!

1. Be aware of the lessons of communication theory.

Closely related to information theory is communication theory. Here, communication may be defined as *a message sent by one utilized by another*. Communication is not just sending a message in a bottle: communication is having someone open that bottle, reading the note, understanding it, and sending for a ship to rescue you. If one link fails, so does the chain.

There are many, many elements required for communication. Imagine the following situation: you see a man on the street. Above

him, you see that a safe is about to fall. Here are all the things that are necessary for communication (you yell, he jumps out of the way) to take place.

- 1) You must *see* the safe.
- 2) You must see the safe about to fall as “dangerous.”
- 3) You must *know* that the way to save this person’s life is to yell to her to get out of the way.
- 4) You must *want* to yell to save the person.
- 5) You must be *capable* of yelling loud enough for the person to hear you.
- 6) You must *speak the same language* as the person you are yelling to.
- 7) The ambient noise of the environment you are yelling in must *not be greater than the volume of your message*.
- 8) The person must *not be hard of hearing*.
- 9) The person must have the *will to live*.
- 10) The person must *believe you* when you yell.
- 11) The person must be *internally* capable of jumping out of the way (the strength, musculature to jump).
- 12) The person must be *externally* capable of jumping out of the way (nothing preventing the person from jumping).

Note that a “no” to any of the above situations will result in a failure of communication: the person will be hit by the safe. Little wonder that real communication is so difficult to attain in society: you may state a message, but there are many obstacles to having people act on what you have said. It is a rare moment indeed when true communication occurs. Do they hear you? Do they understand you? Do they believe you? Do they want to act on your message? Don’t be surprised when you sometimes feel like you’re shouting in the wind; sometimes you are!

1. Be as precise as possible.

Language is inherently fuzzy; it's easy to fall into the habit of using sloppy language practices. Consider the following hypothetical statement made by Mr. X:

Mr. X: Wilson robbed the bank.

With no other available information, here are at least two thoughts you can have after hearing this comment:

1. Wilson robbed the bank.
2. Mr. X believes Wilson robbed the bank.

All too often, people will falsely frame the issue. They will think that Wilson actually *did* rob the bank, even though Mr. X has presented no evidence for this. For many people, an accusation by Mr. X is a statement of facts.

The above applies to the way a person sees reality. One sees more specifically or generally, depending on one's point of view. Imagine that on July 1 at 8:30 pm you give a mint to Rover, a Beagle, after it has eaten two bowls of food. It gets sick. What conclusion do you draw?

1. Don't give mints in the summer to Rover after it has eaten two bowls of food.
2. Don't give mints to Rover after it has eaten two bowls of food.
3. Don't give mints to Rover after it has eaten dinner.
4. Don't give mints to Rover.
5. Don't give mints to Beagles.
6. Don't give candy to Rover.
7. Don't give candy to Beagles.
8. Don't give mints to Dogs.
9. Don't give candy to Dogs.
10. Don't give mints to Animals.
11. Don't give candy to Animals.
12. Don't eat mints at all — anybody. Get rid of mints.

The above are only a fraction of the many, many ways to see this reality, and it may be that *none of them* is the correct conclusion. If one frames the reality specifically, however, one is less likely to fall into error, because one restricts one's prediction to a very small area of reality. As one gathers more experience (you give chocolate to Rover in the winter before dinner, and it gets sick), one can begin to expand the scope of one's statements.

12. Utilize your computer as a thinking tool.

The computer is a marvelous tool, but it's not just a word processor or spreadsheet. Due to its interactive nature, the computer actually can help exercise the mind. Here are several ways you can help the computer help you to become a better thinker:

1. **Outlining**

If you have a program like *Microsoft Word*, you can use a feature called *outlining*. Good for the same reason that file cabinets and folders are good. Knowledge, like people, is more powerful when unified (organized). A set of structured facts more powerful than a set of disembodied facts. Structure comes from analogy, and subsets (abstraction). With this feature, you are able to easily create categories, subcategories, and sub-subcategories, all the way down to nine levels. This makes organizing one's thoughts a breeze.

2. **IdeaFisher**

If you have a Macintosh, there is a program called *Ideafisher* that will allow you to pursue a semantic path that can lead to fascinating associations. The program allows you to make comparisons between two dissimilar words, and can produce terms which bridge the gap. The results can be very surprising. For example, if you give the program "smart" and "cookie," one of the words it gives you back is "fortune cookie." Consider this brief list:

WORD 1	WORD 2	RESULT
Underneath	Evil	Hit below the belt

City	Country	Sightseeing
Big	Little	Magnify
Boring	Fashion	Jogging
Motion	Architecture	Earthquake
Anxiety	Flower	Wedding
Face	Floor Covering	Knockout
Fire	Gambling	Uncontrollable
Humor	Poverty	Politician

By producing startling associations, the program helps you see alternative ways of viewing reality, and gives you a fresh point of view.

3. CD-ROM

A CD-ROM holds a vast amount of information, and in so doing allows the person to explore many avenues. Search with Boolean, vast databases.

4. Modem

Use of a modem allows you to communicate with people across the country with a device known as a *bulletin board*. The bulletin board allows you to have conversations on topics you are interested in with your friends.

5. Games

Various games exist which can help you exercise your mind. One of the great advantages of the computer is that you have a constant Chess companion. If you've never played Chess, you should. Chess offers the following advantages:

- Chess teaches you to distrust the flash of insight which goes "that's it." Learning chess is the great humbler. You may "think" you think about a chess problem — but if all you've done is come up with the wrong answer, you haven't thought. After 1000 "I know the answer's," and finding out that you're wrong, you realize you *don't* know the answer. Chess is great because it's objective. A can *prove* B is wrong.

(It helps us more readily understand our inadequacies in less objective situations).

- Because of the preceding, Chess teaches you to never be satisfied with the first thing in your mind: always look for the rival hypothesis.
- Chess teaches you to see ahead.
- Chess teaches patience.
- Since the game has been deeply analyzed by many brilliant minds, one can get exposed to deep analysis easily. Easy to stand on the shoulders of giants.

Apart from Chess, there are many others, including *Checkers*, *Go*, and even urban simulations like *Sim City*. These games provide excellent exercise for the more formal operations of the mind.

6. Educational Programs

Programs like the *Miracle* help you learn music. Still others will teach you discrete areas, such as statistics, geography, etc.

7. Programming Tools

One can program with macros, or a high-level language like Hypercard, but even Basic can teach a person to think in terms of loops, “if/then” structures, branching, and the other concepts of programming. A great way to exercise deductive logic, and if one is good at it, one can make useful programs for your own use.

17. Organize or memorize.

All other factors being equal, which is easier to remember: one thing or twelve things? If you thought “one thing,” you’re right. That being the case, ask yourself if the following group of letters would be easy to remember:

U — T — L — M — I — D — E — C — F — T — E — A

The chances are excellent that you will find this group of twelve disjointed letters very difficult to remember. It may take a long time to memorize, and there is no guarantee of success. Now ask yourself how easy it would be to remember the following series of letters:

M — U — L — T — I — F — A — C — E — T — E — D

Easier, right? Here, you don't see a disjointed group of twelve letters — instead, you see *one thing*, a *word*, the word “multifaceted.” The trick to remembering the first series was *not* to memorize it as a series of disjoint letters, but to *first* put the letters in a particular grouping that was easy to memorize, and *then* memorize that grouping. You may not be able to rattle off 12 disjoint letters from memory, but you sure can spell “multifaceted.” The mind remembers better in chunks. So, chunk first, remember later. Apply the above lesson to the following series:

Red — screwdriver — jealous — blue — wrench — sad — happy —
hammer — yellow.

Before you attempt to memorize these, you should *organize* them in terms of groups; in this case, COLORS, TOOLS, and EMOTIONS. Thus:

COLORS: Red, blue, yellow.
TOOLS: Screwdriver, wrench, hammer.
EMOTIONS: Hate, sad, happy.

You can further group by putting the terms in alphabetical order:

COLORS: Blue, red, yellow.
EMOTIONS: Jealous, happy, sad.

TOOLS: Hammer, screwdriver, wrench.

You can then create sentences using the first letters of the terms. So “Cars Enter Tunnels” for the main headings, and “Buses Reroute Youth,” “Jeeps Have Steering,” and “Hammocks Sleep Well,” or CET(BRY/JHS/HSW).

You’ll note that the phone company uses this trick (718) 555-1210, the post office (44444-5555), and the government with the social security number (253-33-9999). Chunking helps memory, so chunk away!

1. Recognize the flippability of flippable facts.

Anyone who uses facts in discussions needs to be aware that facts you believe support your point of view can frequently be used to support a contrary point of view; slightly unsettling, to say the least. Unsettling, but also mind-opening; after understanding the flippability of facts, perhaps you will want to re-evaluate your own point of view.

A: I know a car executive who is against pollution — that shows that being against pollution is not necessarily “leftist,” and there’s no problem with regulating car companies.

B: To me, it says that car executives are reasonable men who look out for the public interest — so there’s no need to regulate car companies.

A: Antitrust laws are counterproductive; mergers resulting in mammoth corporations are good. Consolidation leads to efficiency.

B: We’d like to nationalize corporations for the exact same reason.

A: Sam smokes, but he says “don’t smoke.” What a hypocrite!

B: He should know what he’s talking about.

A: We’ve achieved half our goal; we think you should see the glass as half-full and not half-empty.

- B: If you're 500 feet under the ocean, I don't think you'd be satisfied with a half-full oxygen tank.
- A: We should lower taxes; people will work harder if they get to keep more of their money.
- B: If people are wealthier, they'll pursue a life of leisure, and won't want to work as hard; we should raise taxes.
- A: Animals aren't human, so we can do any medical research we want on them.
- B: If animals aren't human, how can any medical research gathered from animals possibly be relevant to humans?
- A: Our company is very profitable; we make \$100,000 per employee.
- B: So you exploit your workers more than other companies — congratulations!
- A: All knowledge is good — let the information flow!
- B: As inferior information multiplies exponentially, quality information will be harder to find. Restrict the flow, and don't surround ducks with decoys.
- A: Thank God women have finally been liberated, and now get to work in the corporations.
- B: Women used to have the entire day to themselves, and now the corporation tells them what to do. You call that liberation?
- A: Crime has increased, but it would have increased faster if we didn't have all these jails. Punishment deters crime. So we should put more money into jails.
- B: If you are correct when you say "punishment deters crime," and crime has increased with increasing punishments, it means that underlying conditions have gotten worse, creating crime faster than punishments can deter. So we should put less money into jails and more into preventive measures.
- A: Our government is "stable."
- B: I suppose I could point out that the dystopia in Orwell's 1984 was "stable," but I'll just note that on a curved road, "stability" means you'll drive into a tree.

- A: Hey, I didn't make the rules, so I'm not responsible.
- B: Your responsibility lies in your failure to work towards creating a system where you had a substantive say in making the rules.
- A: Anyone can succeed at anything within this system, so the system should be maintained.
- B: Since we can succeed at anything within this system, we can succeed at changing this system within this system; and we should attempt to do so, to create a better system.
- A: We have the same laws for rich and poor.
- B: The law, in its infinite wisdom, says that it is illegal for both rich and poor to sleep under bridges; one law for both the lion and the lamb is oppression.
- A: You should eat a candy bar before exercise: you have to pay for what you get.
- B: You should eat a candy bar after exercise: you should be rewarded for hard work.
- A: Our country has immense wealth; and a unique political system. Get the connection?
- B: It's unlikely another country could afford our political system.
- A: The Democrats continually attack the Republicans, and vice versa: thus, the two-party system is good because it allows the truth to emerge.
- B: As I see it, there are three possibilities: one, both parties are chronic liars, and therefore they should both be booted out. Two, both parties are chronically mistaken, but chronic mistakes means chronic incompetence, so they should both be booted out. Or, three, both parties have always been correct, they're incompetent: and so they should both be booted out. [Another poss. here]
- A: It is disrespect for the Constitution to try to amend it.
- B: To the contrary, it is disrespect for the car (constitution) to not give it a tune-up when it needs it; it shows you don't care.
- A: The good news is we haven't scratched the surface.

- B: I thought that was the bad news.
- A: Three admirals have spoken out against nuclear armaments. We should take the word of this military personnel and not have these devices.
- B: If three doctors out of two thousand recommended a policy, who would you listen to?
- A: We promote the general welfare by running deficits to break the back of recession.
- B: We demote the general welfare by running deficits to break the back of recession, in that we deprive future generations of their ability to “break the back of recession.”
- A: He always criticizes me: when I go left, he says “go right,” and when I go right, he says “go left.” I can’t do anything right.
- B: To the contrary; you were never doing anything wrong. One could give a blind man instructions, continually saying “go to the right” when he’s proceeding leftward, and “go to the left” when he’s proceeding rightward. It appears to be constant criticism (“can’t I do anything right?”), but it’s main purpose is to focus the behavior.

26. Get yourself one or two good friends.

You wouldn’t expect to be a great tennis player by hitting a ball against a wall by yourself; nor should you expect to improve your ability to think well by thinking to yourself without the comments by others. Friends can extend your thoughts, give you new avenues to pursue, can steer you off of wrong roads, and provide a burst of enthusiasm when needed. They enable a two-way process essential for intellectual progress.

Unfortunately, all too often are friends are people who aren’t themselves interested in improving their ability to think. Gossip and idle chatter become the order of the day. One becomes submerged in a sea of triviality. And some friends feel it is their role to constantly agree with us, reinforcing our shaky propositions with affirmations. One loses the benefit of criticism, and one gets a sense of false

confidence. When you enter “battle,” you then find, too late, that your gun is loaded with blanks. In contexts such as these, “friends” may be seen as unwitting enemies.

26. Use the *reductio ad absurdum*.

One technique that should be available to everyone is that of the *reductio ad absurdum*. This technique, which means, literally, “reducing to absurdity,” can help reveal the inadequacy of certain beliefs by taking them to their logical conclusion. The term is potentially confusing. Sometimes you *increase* to absurdity.

Here’s a quick example: we know that one horse takes four hours to make a journey, and someone says “so two horses can make it in two hours.” Rather than going into the physics of the situation, one need only point out that by that reasoning, four horses would result in no hours. You show B to be false by revealing that it leads to a false prediction.

Bad ideas valuable as reductio. *Reductio ad absurdum* a valuable tool — teaches more vividly than lecture. The recognition of the bad as bad functions as vaccination. If there *were* a set of conceptions which gave people the ability to get at the meta-conceptions, it would be *imperative* to publish them.

Where dissemblers congregate, unleash the credibility-destroyer, the *reductio*. ¶ A claims a 3dba increase in traffic noise is “imperceptible.” You wish to test him, doing an A/B test. He denies the difference. But if you give him a 6dba difference, and he denies it, he destroys his credibility, because he can’t *hear* a difference, where it has been demonstrated that 99.9% of people *can* hear a difference. Apartment stereo systems.

“But they’re animals!” The animal abusers (scientists?), justify their conduct with this remark. But since “humans” are also animals, this would be functionally identical to a cocker spaniel scientist

experimenting on dachshunds with the justification, “but they’re dogs!”

Here are some examples of the technique in action:

A: To raise the minimum wage is to knock out the bottom rung of the ladder into the job market.

B: Why not lower the minimum wage to .25 cents an hour then? If we lower the rung, more people will be able to get on.

A: We should allow all animal research because animals have no rights.

B: If animals have no rights, humans have no rights, because humans are animals. So we should allow research on humans.

A: We should allow all animal research because animals have no rights.

B: Then we should abolish all cruelty-to-animal laws, shouldn't we?

A: My boss should make as much profit as he can; he took the risks, he should get the reward.

B: Why not ask for a pay cut ?

A: Don't give me a computer, because I don't know how to use one.

B: If someone offered you a Ferrari, would you refuse it because you didn't know how to drive it, or would you take it and learn how to drive it?

A: I believe that the owners of the media should have the freedom to broadcast anything they want, and to not broadcast anything they want.

B: That's a license to brainwash.

A: You never tried suing us — so don't blame us.

B: Other side has nuclear weapons, tanks, napalm, cruise missiles. You have a pistol. “Don't blame us if you don't exercise your right to fight.”

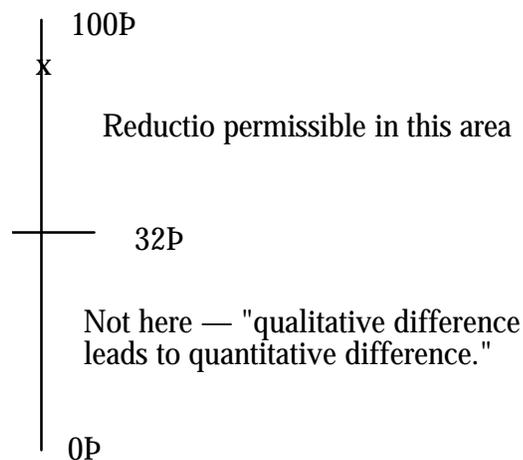
A: We should let people beg in the subways.

B: Should we let them beg in the courts?

Like all techniques, the *reductio* is liable to misuse. Suppose someone attacks the frame-by-frame feature of the VCR with this comment: "This is useful, no doubt, for the viewer who wants to study the directorial nuances of the Flintstones." Since the feature can also be used to study the directorial nuances of worthy cinema like *Citizen Kane*, the remark falls flat on its face.

Vulnerable to slippery slope fallacy.

xvii. Reduction only permissible when not below the threshold of functional identity.



32. Know the value and cost of information.

Anyone can tell you the cost of buying items with prices; what they can't do is tell you the cost of a) things that appear to be free b) the cost of *not* buying items with prices (see Maxim __, ____). For example, people watch television, and think it's free. It's not, for several reasons. First, the cost of the programs is built into the goods you buy (typically 4-5% of the retail price is to compensate for advertising expenses [check this fact]). The cost of television is reflected in the goods we pay; an information tax. Now ask yourself;

if the cost of “free” television turned out to be \$95 a month, would you pay it?

More insidious is the opportunity cost of watching television; specifically, when you watch television, you don't do A, B, and C. Here's where television really becomes a killer. You're not practicing a musical instrument, you're not reading a book, you're not writing a book, you're not thinking independently, you're not working out, you're not having a conversation, you're not interacting with your children — ouch! It's helpful to imagine a meter on the television; when you turn on the TV, pretend that you're simultaneously flipping a taxi meter. As the minutes go by, watch the costs mount. How would you feel about the TV with the meter? Now apply that to real life.

In another area, you may hear people say, “books are expensive.” This remark shows that people know the cost of the information, but don't know the value of it. Imagine this scenario. You are interested in a particular topic: you decide you want someone to research the topic for you, and write a long exposition of it. The person spends a year researching this material, and a year organizing the research. A great deal of intellectual labor. How much do you think this person could charge for this report? Probably \$40,000, at bottom. In fact, many people pay this, and more, for private research reports. For example, at major law firms, it is not unusual for 50 page briefs to cost \$40,000 in combined legal research and writing costs (research and writing by associates, review by partners, typing by secretaries, cite-checking by paralegals, etc.). The clients pay this price, because the information (within the context of a multimillion dollar lawsuit) is worth it. Now, what is a book but a *public* research report? You can receive something for \$10 that's worth \$40,000, because the publisher believes enough people are interested in the report to share the costs of it. Wow! Looking at it from another angle, if you are paid \$5 an hour, when you pay \$9.95

for a book, you're exchanging 2 labor hours for something that took THOUSANDS of hours to produce! You receive a report that, in all likelihood, you could not have produced yourself, because you did not have the background of the author (an additional thousands of hours in preparation).

Sadly, few take advantage of this fantastic trade.

66. Construct the tool before the task.

We are confronted with many tasks. But man is a tool-making animal. We don't have to use our hands: we can use levers, wheels, hammers, pulleys, inclined planes, and whatever else we need to. The larger the task, the more it makes sense to construct a tool before engaging in the task. If you're only tightening the lug-nuts on one tire, a simple tire-wrench will do. But if you have to tighten the lug nuts on 500,000 cars, you'll need to acquire a pneumatic driver.

By the same token, one should not attempt to think without a computer, without books, communicate without modems, think without a logical process, run a govt. w/o an adequate constitution, go from place to place w/o a car, etc.

Tools may be adequate to a purpose, but tools give us purposes because of capacities. Even more true that "where there's a will there's a way" is "where there's a way there's a will." Abacus — you'd never dream of using it to do your mailing list — but you would of computer. ¶ The Const. restricts our dreams.

71. Understand that *quantitative* change sometimes leads to *qualitative* change.

We've all heard about the straw which broke the camel's back. This is a colloquial way to re-fix our perception in the right direction. We typically see quantitative differences (30 degrees vs. 50 degrees)

different from qualitative differences (warm vs. cold). Some people believe they are separate because we can measure one, but not the other. While this is true, this does not mean that the two are not intrinsically related; in point of fact, they are. Some people may be puzzled by this; however, this is surprising only because we have two [artificial] categories, quantitative and qualitative, which seem diametrically opposed. The changes can be dramatic: here are some examples of how small quantitative differences can lead to large qualitative differences:

- A difference of degree (quantity) separates an ice cube from a puddle of water (quality).
- The speed with which computer works leads to an increase in quality of work you do.
- A bench supports 400 lbs. On bench: 399 lb. — STABLE. We add 2 pounds (small quantitative difference). On bench: 401 lbs. — CRUSHED (massive qualitative difference).

The implications of this for thinkers are _____ .

10. When you find a contradiction, look for a distinction.

Because language is vague, we sometimes think there are contradictions where there are none. This valuable piece of advice, paraphrased, was handed down from _____ (Mill? Emerson?). Sometimes it appears that people are doing contradictory things: we think, “you are a hypocrite.” Yet the contradiction may only be in our mind. Consider these examples:

- A: You say you don't want to be rich, yet I bet you wouldn't turn down a lottery prize.

- B: I'm not opposed to *having* money; what I am opposed to is making the search for wealth one of my life's goals.
- A: You are opposed to animal research, yet you eat meat.
- B: I'm opposed to *unnecessary* animal research (about 95% of it). It may interest you to know that I am not opposed to hunting.
- A: You say you don't want any new laws, yet you support increasing the speed limit from 55 mph to 50 mph.
- B: I'm not opposed to *revising* the laws we have; I am opposed to legislating in new areas.
- A: You support the death penalty, but are opposed to abortion on the grounds it is murder. Aren't you being inconsistent?
- B: Not at all — I'm not opposed to *murder* in the abstract, just murder of the innocent.

10. Always look for rival hypotheses.

Too often, we “marry” the first guess that pops into our head. Our ego identifies with our ideas, giving us a predisposition to believe what we believe. Very often an existing predisposition to believe X can lead to an inability to conceive of alternate theories, and/or alternative interpretations of data. In addition to being in part psychologically based, this inability seems to be an inherent defect in the human cognitive structure. Alternate views do not occur to us easily: we have to put in energy to conceive them.

People's ability to detect the existence of rival hypotheses obviously varies. Some individuals are very adept at seeing alternative explanations — others, unfortunately, aren't. Note the following alternative explanations:

Fact

You come home, and find no mail in your mailbox.

Hypothesis

No mail today.

Rival Hypotheses

1. Mailman didn't come because he was sick.
2. Mailman didn't come because it was a holiday.
3. Mailman didn't come because he quit.
4. Mailman didn't come because postal workers went on strike.
5. New mailman made mistake, and delivered mail to wrong address.
6. New mailman forgot to deliver your mail.
7. Someone stole the mail from your mailbox.

Fact

Three times as many men as women pass out in the dental chair.

Hypothesis

When it comes to visiting the dentist, men are the weaker sex.

Rival Hypotheses

1. Men visit dentist more frequently in the morning, the time of day when human beings are most susceptible to fainting.
2. More men don't eat breakfast than women; fainting could have been caused by lack of food.
3. Male patients encouraged to have dental work without novocaine more than females.
4. Men have higher alcohol intake rates the night before, and residual alcohol in blood reacts with novocaine.
5. Women exposed to more pain and suffering at home (their children), and develop environmental resistance to pain (less plausible).
6. Men have more serious dental work (implausible).

Fact

Twice as many women in Who's Who of American Women graduated from women's colleges in comparison with coeducational colleges. Women's colleges employ twice the number of female faculty per 1000 students.

Hypothesis

Female faculty serve as important role models for female students.

Rival Hypotheses

Women's colleges are typically small, private, and expensive, in contrast to coeducational colleges which are typically large, public, and inexpensive, accounting for five of the following eight rival hypotheses:

1. Private schools select the "cream-of-the-crop," the student's with the best GPA's, SAT's, etc.
2. Because student body is wealthier, less need for the students to go to work while in school, which can decrease the ability to achieve academically.
3. The small size of private colleges, coed or otherwise, gives better educational results.
4. Co-ed college has more "distractions" for female students.
5. Who's Who selection process biased towards liberal arts professions, the sorts of professions which may be more likely to be filled by graduates of women's colleges.
6. Women don't have to worry about being seen as unfeminine for being smart in class.
7. In coed schools, more teachers will pick men who raise their hands more than women who raise their hands (implausible?)
8. More courses geared towards women's interests spurs incentive.

Fact

Professor Newton enters data into a calculator, and gets the number 300. To check his result, he enters the data again, but this time gets the number 400. Confused, he enters the data a third time, and gets the number 500!

Hypothesis

Professor Newton made a mistake in entering the data on at least two occasions.

Rival Hypotheses

1. Professor Newton started with the number "200" on his screen, entered data amounting to "100" each time, each time forgetting to clear the screen.
2. The buttons on the calculator are malfunctioning.
3. The battery in the calculator is wearing out.
4. The chip in the calculator is going bad.
5. Professor Newton is losing his eyesight.
6. Professor Newton is losing his mind.

If you did not see any or all of these rival hypotheses, you should note that conceiving of a rival hypothesis is a creative act, and as many artists have noted, ideas are born of a gestation process, where a small idea mushrooms into a much more complex, and even qualitatively different idea. However, this process doesn't occur in an instant, or even overnight. Consequently, it ought not to be surprising that we are unable to conceive of alternative explanations instantly; nor should it be surprising that we see as true the first idea which serves to explain a phenomenon — if only because it requires too much effort to believe otherwise!

No discussion of this topic would be complete without noting a critical insight; though rival hypothesis B may be true, it does not necessarily follow that the original hypothesis A, is false. Consider the following:

Fact

In the late 60's, students were recruited through an ad in a college newspaper, and 15 students with excellent driving records were asked to put a Day-Glo orange Black Panther sticker on their cars. After inspecting the cars for possible safety violations, and declared satisfactory, the students drove off into the outside world. Within 17 days the students rolled up "a total of 33 citations".

Hypothesis

Police vendetta against Black Panthers.

Rival Hypotheses

1. Sympathetic to "the cause," students drove more recklessly than normal to attract police attention, and thus to make the police "look bad."
2. Students became more nervous, and this effected their driving skills for the worse, attracting police attention.
3. People who appear tense to policemen are more likely to be given tickets.

These three rival hypotheses are plausible, but their existence, in and of themselves, does not and cannot discredit the legitimacy of the

vendetta hypothesis. The worst that can be said of the experiment is that its design was not sufficient to preclude other interpretations.

15. Adopt criterion-based thinking.

Too often people will say x is “good” or “bad.” With reference to what? While in the art world specifying criteria is a very difficult task, it is not so in everyday matters. Examples:

Bad: The Constitution is inadequate.

Better: There are at least seven measures for adequacy of a Constitution: accountability, halt corruption, representation of the population, promotes the general (not specific) welfare, promotes justice, efficiency, and guarantee of those rights deemed fundamental by the citizens. The constitution is inadequate because it does not satisfy these criteria.

Bad: He is a bad worker.

Better: Good workers have the following characteristics: they are on time, they do what they're asked, they do quality work, they show up. Because he failed at these, he is a bad worker.

Bad: That was a great movie.

Better: Great movies are original, use the medium in novel ways, every frame filled with meaning, form is servant to the content, aesthetically beautiful, conveys great themes. This film did that.

23. Familiarize yourself with common fallacies.

Awareness of the common errors in thinking is essential for all people who want to think well. Without awareness of these pitfalls, one is liable to fall into the trap of faulty reasoning, and one may find oneself in a thicket difficult to escape. Here is a list of ___ of the most common fallacies, with examples:

The Las Vegas Fallacy

One of the most common fallacies, this fallacy magnifies small possibilities into probabilities. Perhaps a form of wish fulfillment. Las Vegas feeds this fallacy. As the lights flash, the bells sound, and coins from the machines around you shout “put the money in the slots, you dummy!”, the mind is fooled. “I can win, therefore I will.”

A: I am going to run in Central Park.

B: I wouldn't do that. You could get knifed.

A: We need to provide more entry points for poor people.

B: There's no need to do that. I read a story where a welfare mother with six children put herself through college.

Equivocation

When the person you are conversing with uses a key word you have employed in a different sense, that person is equivocating. The shift may be within the literal mode, or perhaps taking a literal phrase metaphorically, or a metaphorical phrase literally.

A: We should try to spend equal amounts on education for all children.

B: People will never be equal.

A: Male and female college students will be living together on separate floors in the dorm.

B: People shouldn't live together before marriage.

A: I'm religious, even though I don't believe in going to Church every Sunday.

B: You're not a religious person.

A: All men are my brothers.

B: That's absurd. I doubt you had more than five brothers.

Fatalism

This is the belief that what always was, always will be. Taken to its logical conclusion, we would never advance.

A: We should pass laws against corruption.

B: There's always been corruption. A new law won't do any good.

A: We should try to address the inequities in our society.

B: Life is unfair.

A: Students should be allowed more control over the educational process.

B: Face it — schools aren't democratic: never have been, never will be..

Innuendo

When people want to avoid making a direct statement, they sometimes use language that implies the direct statement. When challenged later, they can slip out by saying "that's not what I meant." Users of innuendo want to have their cake and eat it too; convey a meaning, but avoid responsibility for conveying the meaning. The meaning is *suggested*, but no direct evidence (what is required) is given. Devastating consequences can ensue, even though no direct charges are made.

A: Why did your ex-employee leave the firm?

B: I'd rather not say.

A: Was he a good student?

B: Let's just say he wasn't the best student we ever had.

A: Why should we vote for you?

B: If you knew my opponent was being financed illegally, would that alter your decision?

Improper Generalization

When people want to plug themselves into a category, they will, with little regard for ____ .

A: You're a bad driver; you don't keep your eyes on the road, and you keep drifting into the other lane, and tailgate.

B: I'm a good driver; I stop at every stop sign, don't I?

A: You seem selfish.

B: I'm not selfish; three years ago I bought a candy bar to support my kid's school.

A: Children shouldn't watch television.

B: You don't want your kid to watch *Sesame Street*?

Irrelevant Distinction

People will sometimes attempt to re-frame an issue with spurious distinctions. Sometimes called "making up a story." Much euphemism falls under this category.

A: You were trying to copy from her paper.

B: I wasn't copying; I just wanted to look at her paper to see what she thought.

A: You're evil.

B: Let's just say I'm not a nice guy.

A: This food contains sodium chloride, dihydrogen oxide, and ascorbic acid.

B: I don't eat anything I can't pronounce.

A: You destroyed the village.

B: I think "pacified" is more accurate.

A: Sam worked hard to be in the Olympics.

B: Sam wasted his time; he didn't earn any commercial endorsements.

A: Cigarette smoking increases the risk of getting cancer.

B: I've been smoking for ten years, and I don't have cancer.

Irrelevant Similarity

The flip side of the coin.

A: California wine isn't made the same way as French wine.

B: California winemakers age their wine underground; so do the French.

- A: We should hire Tom.
B: I could never trust him — he looks like my two-timing ex-boyfriend.

Evasion of Responsibility

People will sometimes attempt to evade responsibility.

- A: You killed innocent civilians.
B: I was defending my country.
- A: You made nerve gas.
B: I was just doing my job. If I didn't do it, someone else would.
- A: You stole those goods.
B: We didn't steal it; we "liberated" those goods from our oppressors.

Jumping to Conclusions

People will sometimes jump to conclusions.

- A: I feel good today.
B: Why didn't you feel good yesterday?
- A: I can't go out tonight. I need to study.
B: You don't think I need to study?
- A: I don't know how you can claim that this is a great stereo, even though like great stereos, it's expensive, is recommended by critics, and weighs a lot.
B: If it looks like a duck, walks like a duck, and quacks like a duck, it's a duck.
- A: While overall I think the Russian system is abominable, there is no denying that they did many great things.
B: (to C) He's a communist.
- A: I'm not sure how good Harvard's philosophy department is.

B: Harvard is a one of the best universities in the country, so it must have one of the best philosophy departments in the country.

A: Why do you think Clinton supports abortion?

B: Because he's a Democrat, and the Democratic platform favors abortion.

Omission of Context

People make statements in context. Tear the statements out of context, and you get an entirely new meaning.

A: "The play was a great success, if you consider poor writing, acting, and directing characteristics of greatness."

B: A said the play "was a great success . . ."

A: While overall I think the Russian system is abominable, there is no denying that they did many great things.

B: He said Russia was "great."

Begging the Question

This very common fallacy uses its conclusion simultaneously as evidence for itself; the argument asserts as true what needs to be proven. Sometimes

A: Abortion should be analyzed.

B: Abortion is murder.

A: Abortion should be analyzed.

B: Women should be allowed to choose.

A: We need to analyze our expenditures.

B: I don't support government "giveaways" or "handouts."

A: X and Y were said to be in love, but their marriage ended in divorce. I thought you said true love never ended in divorce.

B: That wasn't true love then.

- A: Why should I go to college?
B: Because you should, that's why.
- A: Many criminals have been rehabilitated.
B: Then they weren't real criminals.
- A: The evidence shows that Tom was the killer.
B: There's no way Tom could be the killer, because Tom wouldn't hurt a fly.
- A: Is Jim in good health?
B: He must be in good health; they let him out of the hospital, didn't they?
- A: Unlimited freedom of speech is very problematic.
B: To the contrary, we must have unlimited freedom of speech, because a healthy state demands it.

Loaded Question

This fallacy tries to slip in an unstated assumption without question.

- A: I just graduated from high school.
B: Where will you be going to college?
- A: I'm new here at college.
B: Which frat are you going to join?
- A: I've been seeing my girlfriend for six months.
B: When are you two going to get married?
- A: We're getting married in a month.
B: Do you want white china or gold?
- A: I came in to see the new computer.
B: Do you want to pay cash or charge it?

Slippery Slope

This fallacy avoids understanding that _____ .

- A: It's hot today.
B: A hot day isn't really different from a cold day; it's only a difference of degree.
- A: Eat that candy.
B: If I eat that candy, I won't be able to stop, and I'll get fat.
- A: We should extend civil rights to blacks.
B: Give them an inch, they'll take a mile.
- A: Fighting in Vietnam is a mistake.
B: If Vietnam goes, the whole world goes Communist.
- A: Let me do X.
B: If I let you do X, then I have to let everybody.
- A: Handguns should be registered.
B: If we let that happen, before you know it, they'll be confiscating our guns.
- A: The wearing of seatbelts should be mandatory.
B: The next thing you know they'll want to force us to strap ourselves into our beds.
- A: We should have a four-day workweek.
B: Why, if a four-day workweek is good, wouldn't a three-day — or even a two-day — workweek be better? With a little daring, a one-day or half-day workweek could be declared and the world could have full employment tomorrow. (From NYT Sunday Magazine, 12/12/93, p. 28.)
- A: Students should be allowed to make decision.
B: Before you know it, they'll want to take over the school.

False Alternative

People who think in terms of “or” are liable to make the error of assuming that the world reflects their way of viewing reality. For some people, you are either A or not-A, where not-A is the contrary of A. However, sometimes not-A is not the contrary.

- A: I don't think we should be engaged in this business.
B: You're either for us or against us.
- A: The only thing I know at this point is I'm not voting for the Democratic candidate.
B: Then you must be voting for the Republican.
- A: I voted for Brown.
B: Did you vote for him because he's a Republican or because he supports a woman's right to choose?
- A: I don't believe the Bible is literally true.
B: Atheist!
- A: Government needs to be involved in health care.
B: Well, either we give government total control of medicine, or else we must allow our doctors the total freedom they require to do their jobs properly.
- A: One magazine says to put all your money in stocks, another in bonds — I don't know what to do.
B: The solution is simple — put half your money in stocks, and half in bonds.

The Golden Mean Fallacy

Some people believe that the middle view between two extremes must be the correct one since it is in the middle. However, this is not always the case, as the following examples will demonstrate:

- A: Some say the Nazis should be stopped; others, that they should be allowed to carry out their Final Solution.
B: I think the answer should be, allow them to carry out their Final Solution, but half as quickly.
- A: Nixon should have been impeached, or should have been allowed to go free with no sanctions at all.
B: The proper course must have been to have censure by the Senate.

- A: The dealer says it's worth \$1000, but Jim only wants to pay \$500.
- B: Tell Jim to pay \$750 — that's fair.
- A: We both found the treasure at the same time; Joe says he should get it all, I say we should split it.
- B: I think you should compromise; Joe gets 75%.
- A: One magazine says to put all your money in stocks, another in bonds — I don't know what to do.
- B: The solution is simple — put half your money in stocks, and half in bonds.

Argument by Abstraction

Abstractions are powerful, and they direct thinking. Some people let these abstractions control their thoughts.

- A: Tom was arrested for bashing in a neighbor's mailbox when he was fifteen.
- B: I'll never let any *criminal* move into an important position in this company.
- A: Jim stamped hundreds of these documents, but some of the stamps were at an angle.
- B: That just shows that Jim *doesn't care about his work*.
- A: Our salesmen travel on the road.
- B: You mean you expose your employees to potentially fatal conditions just to make money?
- A: This animal research is wasteful.
- B: Animal research saves lives.
- A: We don't need the port in this town.
- B: Don't you want to create jobs?
- A: You haven't mowed your lawn in two months; the whole neighborhood is upset — your house in an eyesore.
- B: I can do what I want with my property.

A: There's only one chance in a thousand we can succeed using this plan.

B: Well, everyone has an equal chance.

A: Joe sent me a thank-you letter after I interviewed him for the position.

B: Looks like he knows the right things to do

A: We should give antibiotics to those with bacterial infections.

B: That's *discrimination* — we should give antibiotics to everybody.

A: Jim wants to live under the Brazilian Constitution.

B: Well, at least it cures the excesses of democracy.

A: I don't like this deal.

B: Take it — it's *fair*.

A: Midas hugged his daughter.

B: Everyone has the right to increase their wealth.

A: I'm not drinking that vinegar.

B: I thought you said that without liquid, you wouldn't survive?

A: The Constitution has been informally amended by the government.

B: A good Constitution is supposed to *evolve*.

A: Quit talking so much — this is a library.

B: It's a *free country*, isn't it?

A: Get that snake away from me!

B: You said you liked animals. Isn't a snake an animal?

Faulty Analogy

Analogies are useful tools; but can be misused, like any tool. Here are some examples of faulty analogies:

- A: We should be faithful to our spouses.
B: You wouldn't expect a person to go to only one kind of movie, would you?
- A: We should vote for Dewey.
B: He looks like the little man on the wedding cake — how can you take someone like that seriously.
- A: Why do you think cyclamates will cause cancer in humans?
B: Because it caused cancer in rats.
- A: Society should be more humane.
B: All nature is a fight for survival.
- A: I have doubts that he's going to graduate college.
B: He graduated high school, didn't he?
- A: I'm opposed to the death penalty.
B: Then why did you swat that fly?

Negative Proof Fallacy

This fallacy consists in assuming that a claim is true because it is not proved false, or vice versa.

- A: They couldn't prove he stole the money.
B: He must be innocent.
- A: Did you get the job?
B: No — I sent them my resume a week ago, but they haven't responded.
- A: No one has been able to prove the existence of God.
B: Then God doesn't exist.
- A: Women in this office should be paid equally for equal work.
B: No woman in this office is dissatisfied with her salary, because none of them have complained.

Omission of Evidence

Sometimes people make idle claims. Here are the most blatant examples.

- A: Why aren't you a doctor?
B: Because I goofed off my first year in college — otherwise, I'd be a doctor now.
- A: There was no way I was going to eat those snails.
B: If you would have only tasted them, you would have loved them.
- A: Why don't you have a girlfriend?
B: Because I don't have a car.
- A: How do you explain the current bad state in America?
B: If the people had been allowed to Reagan for a third term, we wouldn't be in this mess.
- A: Dad, I really think we'd better not do that.
B: Father knows best.
- A: That article in the paper was really full of hot air.
B: They couldn't print it if it wasn't true.

The Post Hoc Fallacy

If you sneeze, and the light goes out, the first thing you might think is that “there is a connection between these two events.” But contiguity is not necessarily connection.

- A: The leaves fall, then the snow falls.
B: Leaves falling causes snow to fall.
- A: I took the pill, and I got better the next day.
B: Taking the pill cured your sickness.
- A: The refrigerator broke.

B: We never had any problems with the refrigerator until you moved in.

A: Business has been bad.

B: That's what you get for not going to church more often.

A: The weather has been acting weird lately.

B: Ever since .

Primary Process Thinking

You confuse exterior with interior.

A: Superman wears a cape, and can fly.

B: If I wear a cape, I'll be able to fly.

Status Quoism

Married to the status quo.

A: _____ . (p. 73, Attacking Faulty Reasoning)

B: If I wear a cape, I'll be able to fly.

Irrelevance

Not relevant.

A: _____ .

B: "Americans have a great heritage built on fine ideals. And we should all help to carry on this great heritage by passing it on to our children."

A: We should pay attention to the reporting by Woodward and Bernstein on Watergate.

B: The evidence against Nixon shouldn't be taken too seriously, because it was obviously put together by reporters out to make a name for themselves.

The Genetic Fallacy

Evaluating a thing in terms of its earlier context and then carrying over that evaluation to the thing in the present.

A: _____ .

B: "Good Christians should not dance, because dancing was originally used in pagan mystery cults as a way of worshipping pagan gods."

A: _____ .

B: "I wouldn't vote for Jim for anything. You see, I grew up with him. We went to grade school together. He was just one big goof-off. You couldn't depend on him for anything. I shudder to think of his being governor of any state in which I lived."

A: _____ .

B: "I hate to see you wear that tie given to you by your former girlfriend."

Irrelevant Goals

Criticizing a thing because it does not achieve goals it was never designed to achieve.

A: I don't think that philosophy will help us solve all our problems.

B: Then why are you wasting time studying it?

A: I need to buy a sweatsuit.

B: Don't buy a sweatsuit; I don't like the way they look.

A: _____ .

B: "I hate to see you wear that tie given to you by your former girlfriend."

False Charge of Inconsistency

Not all inconsistency is bad.

A: John says that cleaning up the environment should be our first priority if we are going to survive the New Millennium.

B: What does he know? He doesn't even keep his own *clothes* clean. He's been wearing the same filthy clothes for the last two weeks.

A: Tom, you shouldn't drink.

B: If you weren't holding a gin and tonic, that argument might be more convincing.

A: At your age, you shouldn't work so hard, Roy.

B: You're the same age as me.

A: When you first learn golf, you need to keep your head down and your eye on the ball.

B: You're the golf pro; why don't you do that?

A: You shouldn't smoke pot; it isn't legal.

B: You drive over the speed limit lots of times.

Absence of Evidence = Evidence of Absence

A: _____

B: _____

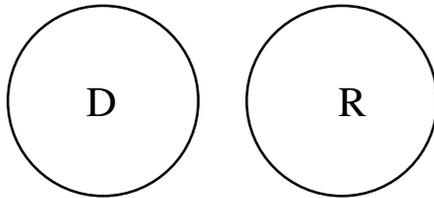
Diversion

A: "My political opponent, Rep. Abbott, is not telling the truth when he says that he has never missed a single roll-call vote in the House of Representatives. According to the *Congressional Record*, Mr. Abbott missed 23 percent of the roll-call votes during his first term."

B: "Ms. Phillips, is the *Congressional Record* the only piece of reading material they would allow you to read at the mental hospital when which you were a patient during my first term?"

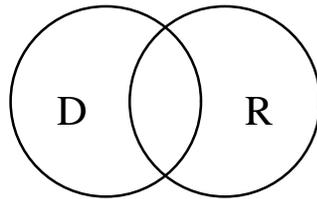
100. Clarify conceptions with Venn diagrams.

It is difficult enough to establish that people are seeing the same meaning (they generally don't). But the intersection of terms is where we run into problems. Between the terms "democracy" and "republic," for example, we can have the following relationships:



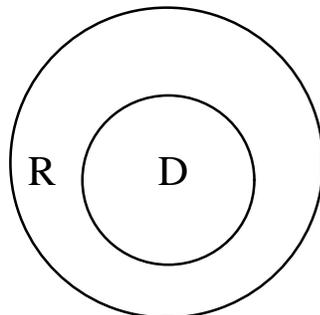
Exclusion

No democracy is a republic; no republic is a democracy.



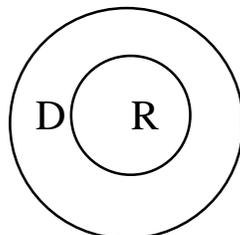
Intersection

Some democracies are republics; some republics are democracies.



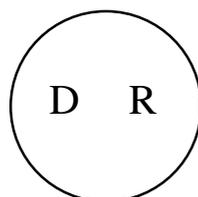
Enclosed

All democracies are republics.



Enclosure

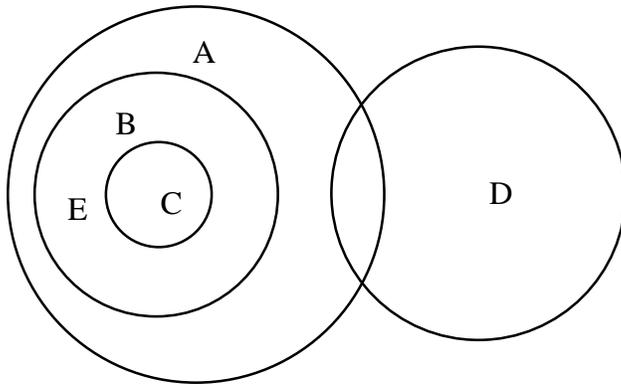
All republics are democracies.



Coextension

All republics are democracies; all democracies are republics.

See if you can find the relationships in the following chart:



- 1) Exclusion: C & D (“no cat is a dog”)
- 2) Intersection: A & D (“Some Daves are Australian”)
- 3) Enclosed (B): B within A (“All bulls are Animals”)
- 4) Enclosure (B): C within B (“All cancer is bad”)
- 5) Coextension: B and E (“All 4 is $2 + 2$ ”).