

By Roger von Oech

A Whack on the Side of the Head

A Kick in the Seat of the Pants

Roger von Oech's Creative Whack Pack

Roger von Oech's Ancient Whacks of Heraclitus

A Whack on the Side of the Head

How You Can Be More Creative

Magical Third Edition

Roger von Oech

Illustrated by George Willett



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A Whack on the Side of the Head



Mental Sex

Exercise: In my seminars, I like to start the participants off with the following exercise. Take a moment to do it.

1. When was the last time you came up with a creative idea?

- This morning
- Yesterday
- Last week
- Last month
- Last year

2. What was it?

3. What motivates you to be creative?

The answers I get usually run something like this: "I found a way to debug a software program"; "I thought up a new fund-raising strategy for our school"; "I discovered a way to sell a new application to a hard-to-satisfy client"; "I developed a new geometry curriculum"; "I motivated my daughter to do her homework"; or, "I decorated the living room around a different color."

Not long ago, I met a man who told me that he got his last creative idea a year ago. "This must have been *some* idea to have overshadowed everything else this year," I thought to myself, and asked him what it was. "I found a quicker way home from work," he replied.

I guess this person wasn't very motivated. He seemed to be saying, "Everything is fine," and there's no reason to deviate



from what's worked in the past. But he made me think: why be creative? Why challenge the rules? Why run the risk of failing and looking foolish?

I can think of two good reasons. The first is change. When things change and new information comes into existence, it's no longer possible to solve current problems with yesterday's solutions. Over and over again, people are finding out that what worked two years ago won't work today. This gives them a choice. They can either bemoan the fact that things aren't as easy as they used to be, or they can use their creative abilities to find new answers, new solutions, and new ideas.

A second reason for generating ideas is that it's a lot of fun. Indeed, I like to think of creative thinking as the "sex of our mental lives." Ideas, like organisms, have a life cycle. They are born, they develop, they reach maturity, and they die. So we need a way to generate new ideas. Creative thinking is that means, and like its biological counterpart, it's also pleasurable.

What Is Creative Thinking?

Exercise: Let's suppose that you're a marketing hot shot. You get a call from the president of a large company and learn that somehow his inventory system has fouled up, and his company now has a \$1,000,000 over-supply of ball bearings. Your task is to think of things to do with the ball bearings, using them either one-at-a-time or in combinations. Take a minute to list your ideas.

I once asked advertising legend Carl Ally what makes the creative person tick. Ally responded, "The creative person wants to be a know-it-all. He wants to know about all kinds of things: ancient history, nineteenth century mathematics, current manufacturing techniques, flower arranging, and hog futures. He never knows when these ideas might come together to form a new idea. It may happen six minutes later or six years down the road. But the creative person has faith that it will happen."

I agree. Knowledge is the stuff from which new ideas are made. Nonetheless, knowledge alone won't make a person creative. I think that we've all known people who knew lots of facts and nothing creative happened. Their knowledge just sat in their crania because they didn't think about what they knew in any new ways. The real key to being creative lies in what you do with your knowledge.

Creative thinking requires an outlook that allows you to search for ideas and play with your knowledge and experience. With this outlook, you try different approaches, first one, then another, often not getting anywhere. You use crazy, foolish and impractical ideas as stepping stones to practical new ideas. You break the rules occasionally, and explore for ideas in unusual outside places. And, in the end, your creative outlook enables you to come up with new ideas.

Speaking of a creative outlook, how did you do with the ball bearing exercise? What ideas did you generate? Here are some possibilities:

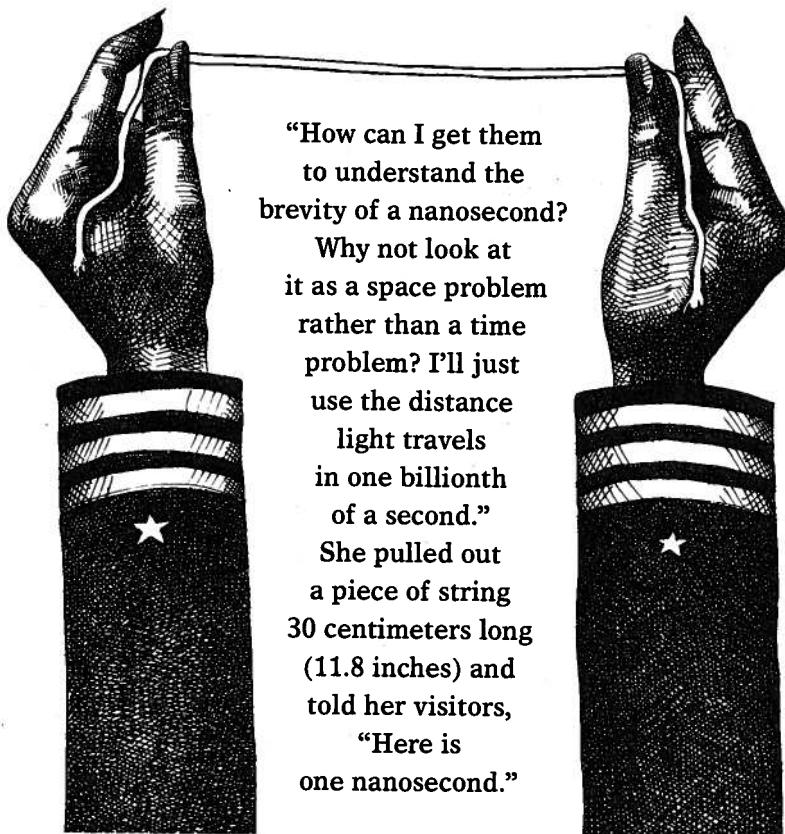
- Use them as level testers.
- Sew them into a canvas vest and use them as "weight clothing" for athletes-in-training.
- Make furniture out of them — like bean bag chairs — to be used in public places. Since they'd be heavy, they wouldn't get stolen.
- Make jewelry out of them: earrings, bracelets, and necklaces.
- Use them as confetti at a punk rock concert.
- Serve them as robot caviar (when your "home robot" is having friends over).
- Put them on the bottom of uneven curtains and use them as curtain weights.

The point of this exercise is that an idea, concept, or thing — in this case a ball bearing — takes its meaning from the context in which you put it. If you change its context, it will take on a different meaning. For example, transferring a ball bearing from the "things that reduce friction" context to that of "shiny and pretty things" gives us all kinds of jewelry and art ideas. Emphasizing its "mass" characteristics allows us to think of "weight" ideas, such as curtain weights. Thus, changing contexts is one way to discover the possibilities of your resources. Here are some examples of people who used this type of thinking to create new ideas.

The first is Johann Gutenberg. What Gutenberg did was to combine two previously unconnected ideas: the wine press and the coin punch. The purpose of the coin punch was to leave an

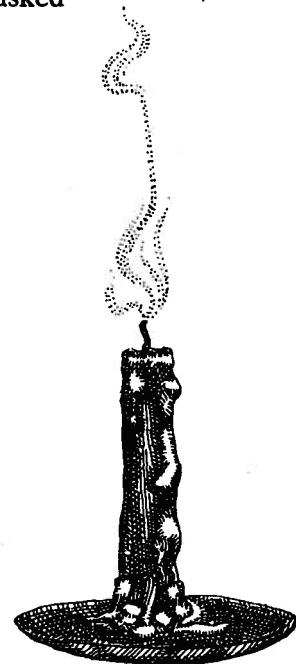
image on a small area such as a gold coin. The function of the wine press was, and still is, to apply force over a large area to squeeze the juice out of grapes. One day, Gutenberg, perhaps after he'd drunk a goblet of wine, asked himself, "What if I took a bunch of these coin punches and put them under the force of the wine press so that they left their image on paper?" The resulting combination was the printing press and movable type.

Navy Commander Grace Hopper had the task of explaining the meaning of a "nanosecond" to some non-technical computer users. (A nanosecond is a billionth of a second, and it's the basic time interval of a supercomputer's internal clock.) She wondered:



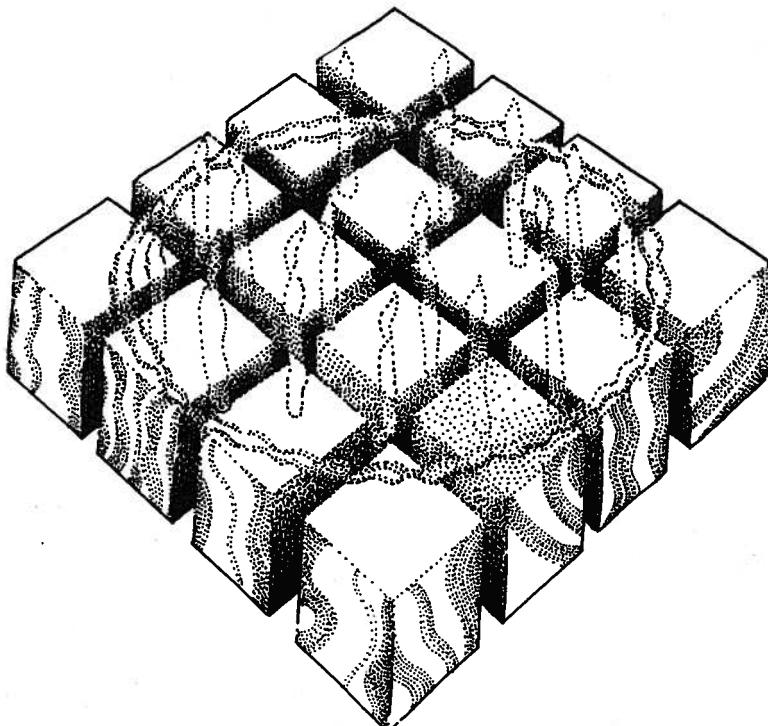
In the second century B.C., a young Greek librarian had the job of trying to think of a more efficient way to order and retrieve the thousands of manuscripts that he had stored away. "How should I order these?" he wondered. "By subject? By author? By color?" Then he thought of the alphabet. His contemporaries thought of it simply as a series of phonetic symbols — *alpha, beta, gamma, delta, epsilon* — that create words when joined together. This librarian decided to de-emphasize the alphabet's linguistic qualities and emphasize the letters' order in relation to one another. He put all the documents beginning with *gamma* after those beginning with *beta* but in front of those beginning with *delta*. In the process, he created alphabetization, the primary means for ordering, storing, and retrieving information.

In 1792, the musicians of Franz Joseph Haydn's orchestra were mad because the Duke had promised them a vacation, but continually had postponed it. They asked Haydn to talk to the Duke about getting some time off. Haydn thought for a bit, decided to let music do the talking, and wrote the "Farewell Symphony." The performance began with a full orchestra, but as the piece goes along, it is scored to need fewer and fewer instruments. As each musician finished his part, he blew out his candle and left the stage. They did this, one by one, until the stage was empty. The Duke got the message and gave them a vacation.



One day Pablo Picasso went outside his house and found an old bicycle. He looked at it for a little bit and took off the seat and the handle bars. Then he welded them together to create the head of a bull.

And then there's my daughter Athena. On her third birthday, I gave her a small box with sixteen colored cubes in it. She picked it up, shook it, and told me that it was a rattle. She opened it up and said that it was a wallet and the cubes were money. Then she piled the cubes up, and they became a birthday cake.



Each of these examples illustrates the creative mind's power to transform one thing into another. By changing perspective and playing with our knowledge, we can make the ordinary extraordinary. In this way, wine presses squeeze out information, string is transformed into nanoseconds, labor grievances become symphonies, and bicycle seats turn into bulls' heads. The Nobel prize winning physician Albert Szent-Györgyi put it well when he said:

Discovery consists of looking at the same thing as everyone else and thinking something different.

Here are four quick exercises to give you a chance to "think something different."

Exercise: An eccentric old king wants to give his throne to one of his two sons. He decides that a horse race will be run and the son who owns the slower horse will become king. The sons, each fearing that the other will cheat by having his horse run less fast than it is capable, ask the court fool for his advice. With only two words the fool tells them how to make sure that the race will be fair. What are the two words?

Exercise: Can you think of a way in which you put a sheet of newspaper on the floor so that when two people stand face to face on it, they won't be able to touch one another? Cutting or tearing the paper is not allowed. Neither is tying up the people or preventing them from moving.

Exercise: What is this figure?



Exercise: Shown below is the Roman numeral seven. By adding only a single line, turn it into an eight.

VII

This is pretty easy; all you have to do is add a vertical line to the right of the VII to create an eight: VIII. Want something a little more challenging? Shown below is a Roman numeral nine. By adding only a single line, turn it into a 6.

IX

Some people put a horizontal line through the center, turn it upside down, and then cover the bottom. This gives you a Roman numeral VI. But if you're "thinking something different," you might put an "S" in front of the IX to create "SIX." If you did this, you've taken the IX out of the context of Roman numerals and put it into the context of Arabic numerals spelled out in English. What prevents some people from doing this is that even with only three examples of Roman numerals — VII, VIII, and IX — they get locked into the context of Roman numerals. Let's look for another answer. Can you think of other ways in which you can add a single line to "IX" and turn it into a 6?

IX

Another solution might be to add the line "6" after IX. Then you get IX6, or one times six. Here the "X" no longer represents "10" or the English letter "X" but rather the multiplication sign. The point: everybody has a lot of knowledge; by shifting the contexts in which you think about it, you'll discover new ideas.

(Switch horses. Try putting the newspaper in a doorway — door closed — with the two people standing on each side. If you look at it one way, it's a bird. If you look at it another way, it could be a question mark. If you turn it upside down, it looks like a seal juggling a ball on its nose.)

Mental Locks

Why don't we "think something different" more often? There are several main reasons. The first is that we don't need to be creative for most of what we do. For example, we don't need to be creative when we're driving on the freeway, or riding in an elevator, or waiting in line at a grocery store. We are creatures of habit when it comes to the business of living — everything from doing paperwork to tying our shoes to haggling with telephone solicitors. For most of our activities, these routines are indispensable. Without them, our lives would be in chaos, and we wouldn't get much accomplished. If you got up this morning and started contemplating the bristles on your toothbrush or questioning the meaning of toast, you probably wouldn't make it to work. Staying on routine thought paths enables us to do the many things we need to do without having to think about them.

Another reason we're not more creative is that we haven't been taught to be. Much of our educational system is an elaborate game of "guess what the teacher is thinking." Many of us have been taught that the best ideas are in someone else's head.

There are times, however, when you need to be creative and generate new ways to accomplish your objectives. When this happens, your own belief systems may prevent you from doing so. Here we come to a third reason why we don't "think something different" more often. Most of us have certain attitudes that lock our thinking into the status quo and keep us thinking "more of the same." These attitudes are necessary for most of what we do, but they get in the way when we're trying to be creative.

I call these attitudes "mental locks." There are ten mental locks in particular that I've found to be especially hazardous to our thinking. They are listed on the next page. As you can well imagine, it's difficult to get your creative juices flowing if you're always being practical, following the rules, afraid to make mistakes, or under the influence of any other mental lock.

1. The Right Answer.
2. That's Not Logical.
3. Follow the Rules.
4. Be Practical.
5. Play Is Frivolous.
6. That's Not My Area.
7. Don't Be Foolish.
8. Avoid Ambiguity.
9. To Err Is Wrong.
10. I'm Not Creative.

Opening Mental Locks

So, how do we open these mental locks? Let's turn to the following story for a possible answer.

A creativity teacher invited one of his students over to his house for afternoon tea. They talked for a bit, and then came time for tea. The teacher poured some into the student's cup. Even after the cup was full, he continued to pour. The cup overflowed and tea spilled out onto the floor.

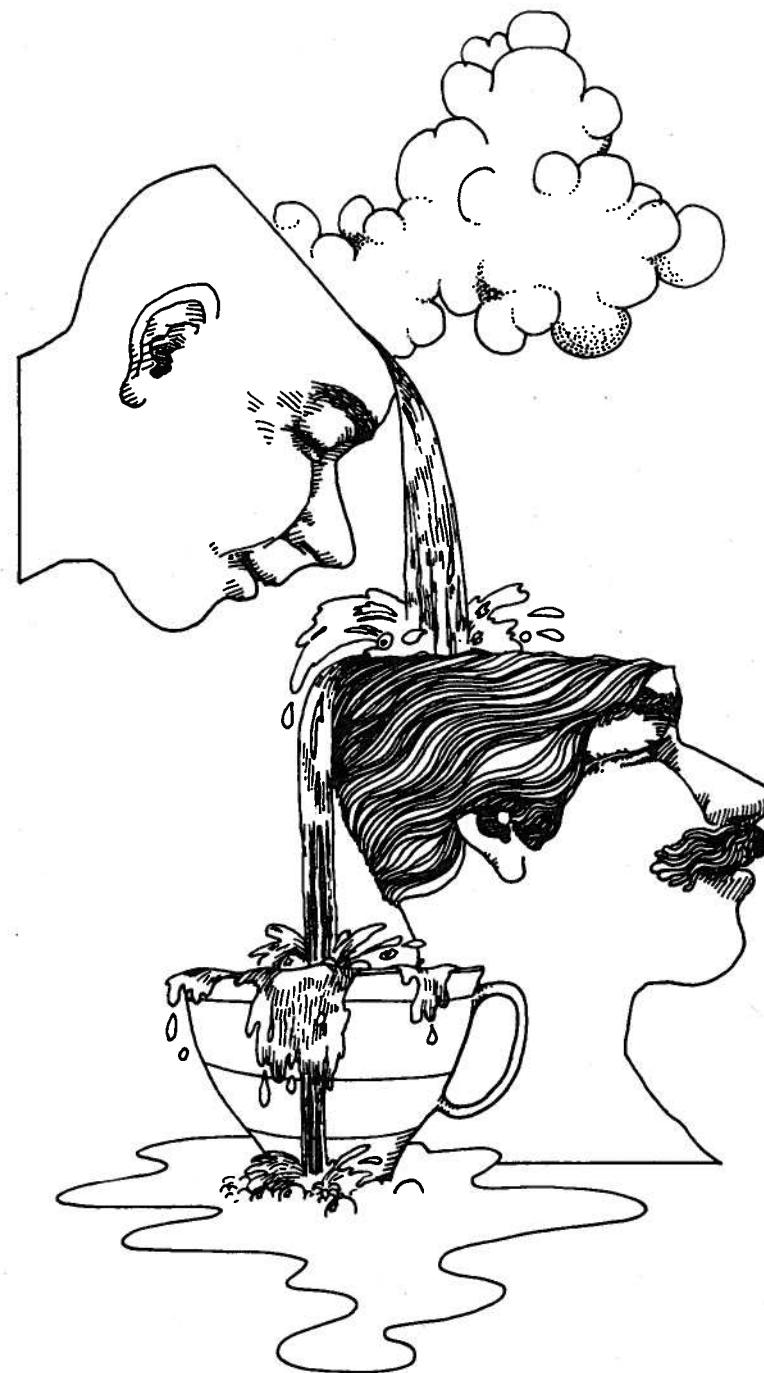
Finally, the student said: "Master, you must stop pouring; the tea is overflowing — it's not going into the cup."

The teacher replied, "That's very observant. The same is true with you. If you are to receive any of my teachings, you must first empty out what you have in your mental cup."

Moral: We need the ability to unlearn what we know.

From our examples, we can see that Gutenberg forgot that wine presses only squeeze grapes — the "right answer"; Hopper didn't realize that everyday package-string was "outside the area" of supercomputing; Haydn didn't understand that equating music and labor grievances was a "foolish" idea; and Picasso broke the "rule" that bicycle seats are for sitting on.

Without the ability to temporarily forget what we know, our minds remain cluttered with ready-made answers, and we never have an opportunity to ask the questions that lead off the beaten path in new directions. Since the attitudes that create mental locks have all been learned, one key to opening them is to temporarily unlearn them — to empty our mental cup.



This sounds like a simple technique, but sometimes it's difficult to apply. Often we have integrated these mental locks so well into our thinking and behavior that we are no longer aware that we're being guided by them. They have become habits. The danger of habits is that a person can become a prisoner of familiarity. The more often you do something in the same way — whether it's cooking a meal or managing a project — the more difficult it is to do it in any other way. You get stuck in how you already think about things.

So, sometimes we need a little help to open the mental locks. Let's return to our creativity teacher once more.

At another lesson the teacher and the student are discussing a problem. Despite lengthy conversation, the student doesn't seem to understand the point the teacher is making.

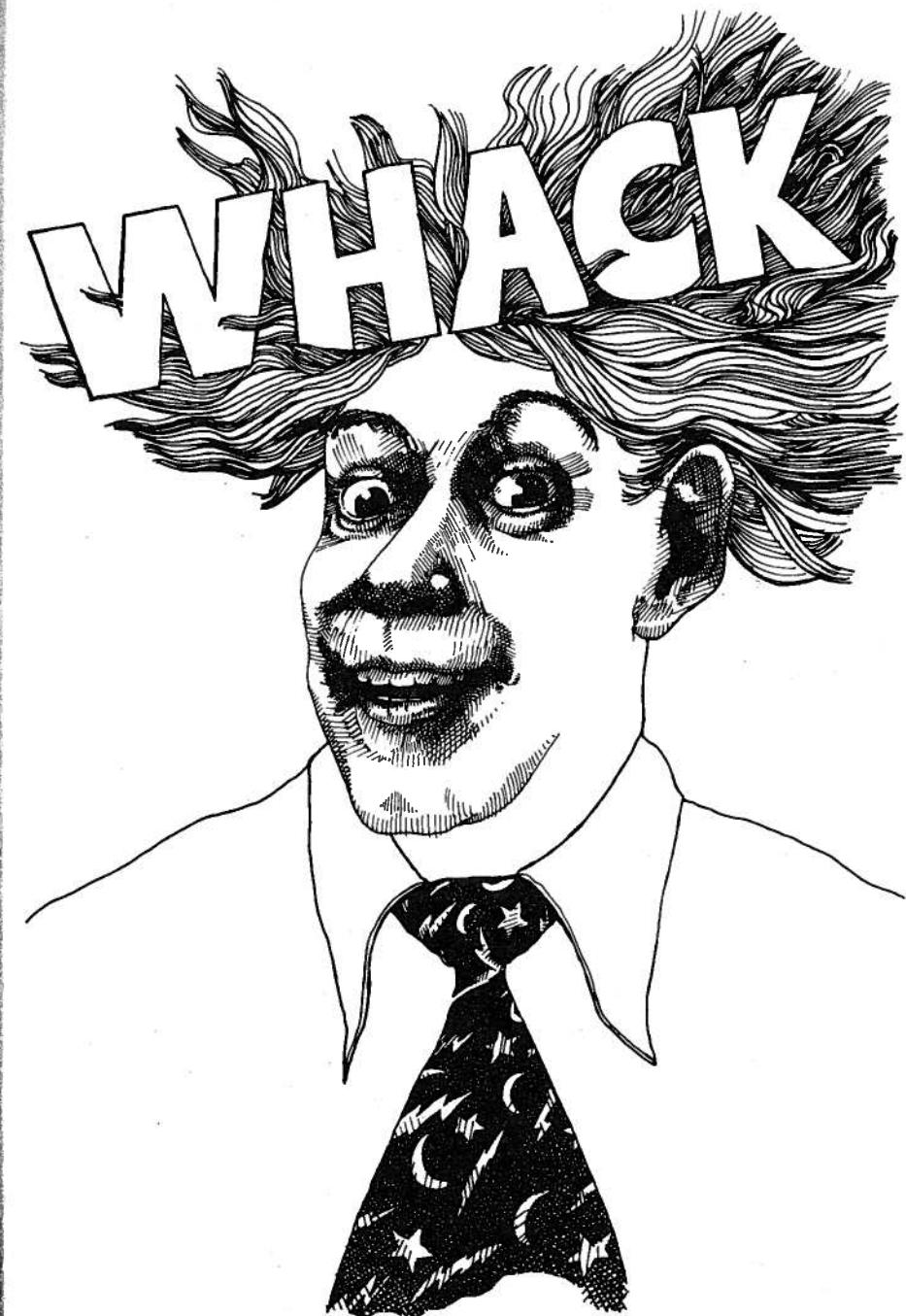
Finally, the teacher picks up a stick and gives him a whack on the side of the head with it. Suddenly, the student begins to grasp the situation and "think something different."

Moral: Sometimes, nothing short of "a whack on the side of the head" can dislodge the assumptions that keep us thinking "more of the same."

Getting Whacked

Like the student, we all need an occasional "whack on the side of the head" to shake us out of routine patterns, to force us to re-think our problems, and to stimulate us to ask the questions that may lead to other right answers.

"Whacks" come in all shapes, sizes, and colors. They have



one thing in common, however. They force you — at least for the moment — “to think something different.” Sometimes you’ll get whacked by a problem or a failure. Sometimes it’ll be the result of a joke or a paradox. And sometimes it will be a surprise or an unexpected situation that whacks you. Here are some examples:

- ◆ It could result from your getting fired from a job, or failing to obtain a performance raise.
- ◆ It could happen when a teacher tells you that she thinks that you have a special talent in an area you’d never thought much about and assigns a project — due next Friday — to help you develop it.
- ◆ It might happen when the supplier for a vital sub-component of your best selling product unexpectedly goes on strike and you’re forced to scramble to find a new source. When the dust has cleared you discover that the new vendor is far superior in product quality.
- ◆ It could come when you recognize a relationship between two things you thought were unconnected such as a spiral galaxy and a spinning ice skater.
- ◆ It could happen when you observe the second hand of your watch in a mirror. (Try it!)
- ◆ It could be the result of traveling to another country, say England, and being forced to drive on the left side of the road.
- ◆ It could happen when someone tells you that the answer to your problem is the sixth word down on page 247 of your dictionary, and when you look it up, you discover that she’s right.
- ◆ It could happen when you break your leg and you realize how much you took your ambulatory habits for granted.
- ◆ It could be a question you never thought about:

- ☞ “What’s the rationale behind many cars having two keys — one for the door and the other for the ignition?”
- ☞ “Is the push-button telephone the death of the word ‘dialing?’”
- ☞ “If one synchronized swimmer drowns, do the others have to drown too?”
- ☞ “If camels are the ‘ships of the desert’ why aren’t tugboats the ‘camels of the sea?’”
- ☞ “Is it against the law to yell ‘Movie!’ in a crowded fire house?”
- ☞ “If there were fewer sponges would the ocean be deeper?”
- ☞ “If you put an orchid in your refrigerator and a day later it starts smelling like salami, does the salami start smelling like an orchid?”
- ☞ “Which way is clockwise on a digital watch?”
- ☞ “Do sportscasters in India yell, ‘Holy Cow?’”
- ☞ “If we call oranges ‘oranges,’ why don’t we call bananas ‘yellows,’ or apples ‘reds?’”
- ◆ It could be a joke:

Q: What is the difference between a cat and a comma?

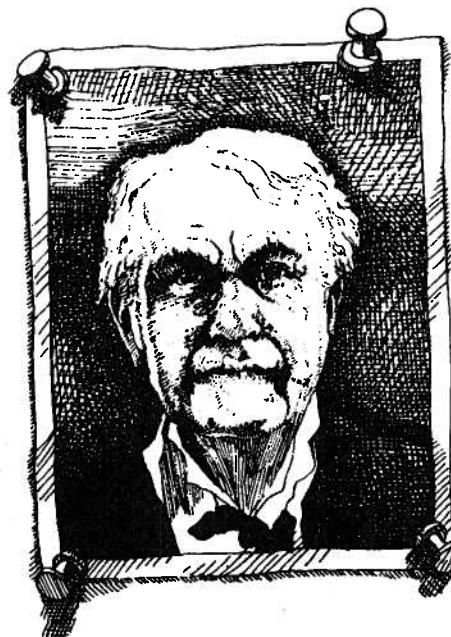
A: A cat has its claws at the end of its paws and a comma is the pause at the end of a clause.

Those ideas or situations that cause you to get off your routine paths and “think something different” are whacks to your thinking.

Sometimes getting a whack on the side of the head can be the best thing to happen to you. It might help you spot a poten-

tial problem before it arises. It could help you discover an opportunity that wasn't previously apparent. Or, it could help you generate some new ideas.

Thomas Edison serves as a good example for the benefits of getting whacked. As a young man, his primary interest was improving the telegraph. He invented the multiplex telegraph, the ticker tape machine (a variation of the telegraph), and other telegraphic innovations. Then, in the early 1870's, the financier Jay Gould bought out the Western Union telegraph system thereby establishing a monopoly over the industry. Edison realized that as long as Gould owned the system, the need to be innovative was reduced. This whacked him out of his telegraphic routine, and forced him to look for other ways in which to use his talent. Within a few years, he came up with the light bulb, the power plant, the phonograph, the film projector, and many other inventions. He may have discovered these anyway, but Gould's whack was certainly a stimulant in getting him to look for other opportunities.



A more recent example is Rex McPherson — a third-generation citrus grower in central Florida. In the early 1980's, he lost 85% of his citrus stock due to severe freezes two consecutive years. This loss forced him to re-think his whole citrus-growing concept. Rex realized that the trees (planted by his grand-

father in the 1930's and 1940's) had been placed fairly far apart because land at that time was cheap. Land values have skyrocketed since then, and he realized that if he wanted to stay in the citrus business he had better re-think his concept. He decided to use new hybrids and irrigation techniques in order to plant the trees close together. As a result, not only has his yield increased significantly, but also the closeness of the trees has helped to inhibit freezing. The whack (the loss due to the freezes) was painful at the time, but it provided Rex with the impetus to "think something different."

Here's a personal whack. Several years ago, the pool where my Masters swimming team works out was closed for a month of maintenance. During the downtime, the members had to practice with other clubs in the area. When we were reunited a month later, there was a great outpouring of new workout ideas. One person had been with a team that had low rest-interval workouts. Another came back with a heartbeat interval workout. Another found a new type of ankle pull-buoy. All these ideas were discovered because we were forced to break our routine.

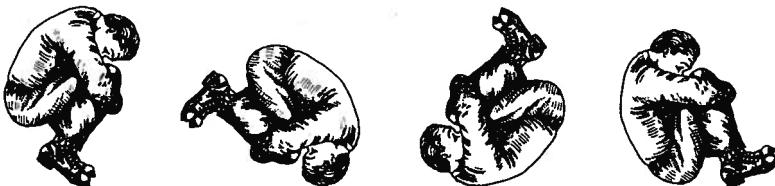
And here's a final personal whack that I can't resist sharing. On my son's 7th birthday, our family went out to dinner. Alex ordered salmon. When our dinners arrived, he looked at his plate. Next to the salmon lay a wedge of lemon. "What's this for?" he asked. I explained that it was used to season the fish. "But you'd better taste it first," I warned. A moment later, I heard him exclaim, "Yow! That's the sourdest lemon I've ever tasted." Of course, I meant for him to taste the fish first to see how much lemon juice to put on it. Who's to say what the right answer is? I've never looked at condiments in the same way since. Maybe we should taste more lemons to jolt our thinking.

Summary

We don't need to be creative for most of what we do, but when there is a need to "think something different," our own attitudes can get in the way. I call these attitudes mental locks.

Mental locks can be opened in one of two ways. The first technique is to become aware of them, and then to temporarily forget them when you are trying to generate new ideas. If that doesn't work, maybe you need a "whack on the side of the head." That should dislodge the presuppositions that hold the locks in place.

For the remainder of the book, we'll examine each of the mental locks and find out what kinds of ideas can be generated by temporarily opening them. We'll also take a look at some techniques to whack our thinking. Along the way we'll meet some interesting head-whackers: artists, poets, revolutionaries, magicians, explorers, fools, and self-trusting innovators.

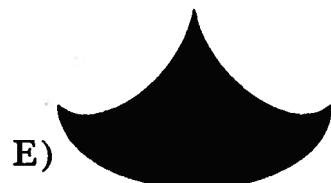
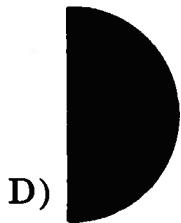
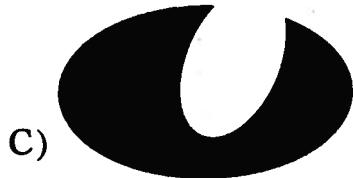
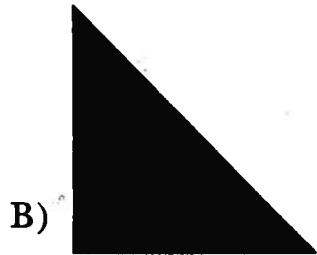
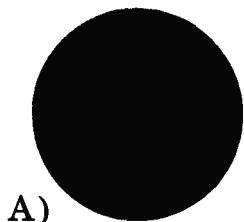


Let's Get Rolling!

1. The Right Answer



Exercise: Five figures are shown below. Select the one that is different from all the others.



Learning How to Think

Children enter school as question marks and come out as periods.

— Neil Postman, Educator

Life can be like a big noisy party with people talking, music playing, and glasses clinking. But even with all of this noise, it's possible for you to understand the person across from you. Or the one thirty feet away. That's because our attention is selective — we can tune in certain things and tune out others.

See for yourself. Take a look around where you're sitting and find four things that have "red" in them. Go ahead and do it. With a "red" mindset, you'll find that red jumps right out at you: a red telephone book, red in the blister on your index finger, red in the wallpaper, and so on. Similarly, whenever you learn a new word, you hear it eight times in the next three days. In like fashion, you've probably noticed that after you get a new car, you see that make everywhere. That's because people find what they are looking for. If you look for beauty, you'll find beauty. If you look for conspiracies, you'll find conspiracies. It's all a matter of setting your mental channel.

Where do you learn how to set your mental channel? One important source is your formal education. There you learn what is appropriate and what is not. You learn many of the questions you use to probe your surroundings. You learn where to search for information, which ideas to pay attention to, and how to think about these ideas. Your educational training gives you many of the concepts you use to order and understand the world.

Speaking of education, how did you do on the five-figure exercise on the previous page? If you chose figure B, congratulations! You've picked the right answer. Figure B is the only one that has all straight lines. Give yourself a pat on the back!

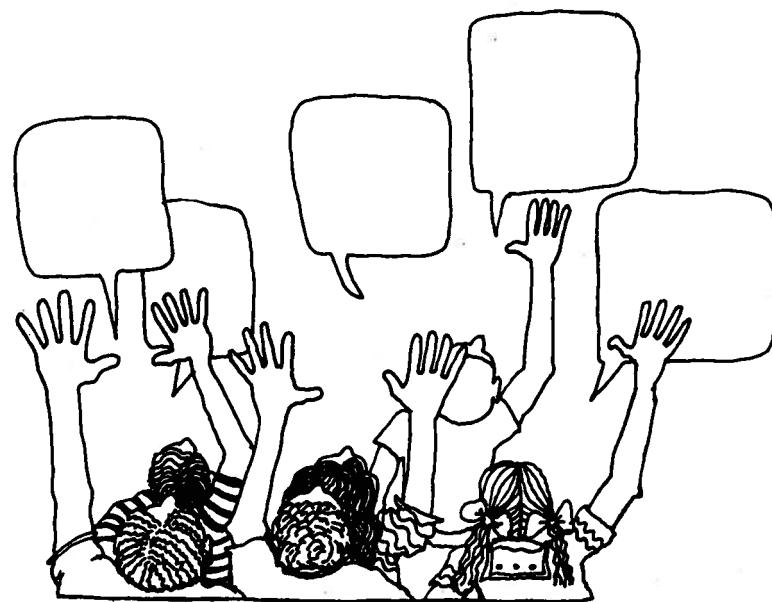
Some of you, however, may have chosen figure C, thinking that C is unique because it's the only one that is asymmetrical. And you are also right! C is the right answer. A case can also be made for figure A: it's the only one with no points. Therefore, A is the right answer. What about D? It is the only one that has both a straight line and a curved line. So, D is the right answer too. And E? Among other things, E is the only one that looks like a projection of a non-Euclidean triangle into Euclidean space. It is also the right answer. In other words, they are all right depending on your point of view.

But you won't find this exercise in school. Much of our educational system is geared toward teaching people to find "the right answer." By the time the average person finishes college, he or she will have taken over 2,600 tests, quizzes, and exams — many similar to the one you just took. The "right answer" approach becomes deeply ingrained in our thinking. This may be fine for some mathematical problems where there is in fact only one right answer. The difficulty is that most of life isn't this way. Life is ambiguous; there are many right answers — all depending on what you are looking for. But if you think there is only one right answer, then you'll stop looking as soon as you find one.

When I was a sophomore in high school, my English teacher put a small chalk dot like the one below on the blackboard.



She asked the class what it was. A few seconds passed and then someone said, "A chalk dot on the blackboard." The rest of the class seemed relieved that the obvious had been stated, and no one else had anything more to say. "I'm surprised at you," the teacher told the class. "I did the same exercise yesterday



with a group of kindergartners, and they thought of fifty different things it could be: an owl's eye, a cigar butt, the top of a telephone pole, a star, a pebble, a squashed bug, a rotten egg, and so on. They had their imaginations in high gear."

In the ten year period between kindergarten and high school, not only had we learned how to find the right answer, we had also lost the ability to look for more than one right answer. We had learned how to be specific, but we had lost much of our imaginative power.

An elementary school teacher told me the following story about a colleague who had given her first graders a coloring assignment:

The instructions said: "On this sheet of paper, you will find an outline of a house, trees, flowers, clouds, and sky. Please color each with the appropriate colors."

One of the students, Patty, put a lot of work into her drawing. When she got it back, she was surprised to find a big black "X" on it. She asked the teacher for an explanation. "I gave you an 'X' because you didn't follow the instructions. Grass is green not gray. The sky should be blue, not yellow as you have drawn it. Why didn't you use the normal colors, Patty?"

Patty answered, "Because that's how it looks to me when I get up early to watch the sunrise."

The teacher had assumed that there was only one right answer. The practice of looking for the "one right answer" can have serious consequences in the way we think about and deal with problems. Most people don't like problems, and when they encounter them, they usually react by taking the first way out they can find — even if they solve the wrong problem. I can't overstate the danger in this. If you have only one idea, you have only one course of action open to you, and this is quite risky in a world where flexibility is a requirement for survival.

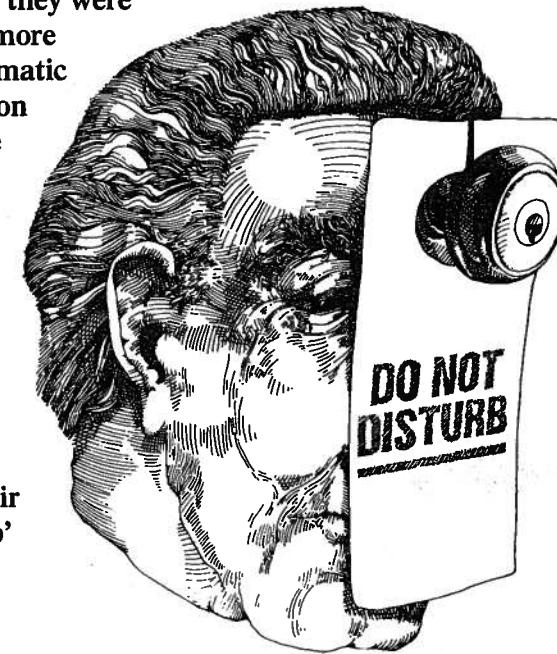
An idea is like a musical note. In the same way that a musical note can only be understood in relation to other notes (either as a part of a melody or a chord), an idea is best understood in the context of other ideas. If you have only one idea, you don't have anything to compare it to. You don't know its strengths and weaknesses. I believe that the French philosopher Emilé Chartier hit the nail squarely on the head when he said:

Nothing is more dangerous than an idea when it is the only one we have.

For more effective thinking, we need different points of view. Otherwise, we'll get stuck looking at the same things and miss seeing things outside our focus.

The Second Right Answer

A leading business school did a study that showed that its graduates performed well at first, but in ten years, they were overtaken by a more streetwise, pragmatic group. The reason according to the professor who ran the study: "We taught them how to solve problems, not recognize opportunities. When opportunity knocked, they put out their 'Do Not Disturb' signs."



Not long ago I did a series of creative thinking workshops for the executive staff of a large computer company. The president had called me in because he was concerned about the stagnant thinking environment at the top. It seemed that whenever his subordinates would make a proposal, that's all they'd make — just one. They wouldn't offer any alternative ideas. Since they had been trained to look for the right answer, they usually didn't go beyond the first one they found. The president knew that it was easier to make good decisions if he had a variety of ideas from which to choose. He was also concerned with how conservative this "one-idea" tendency had made his people's thinking. If a person were presenting only one idea, he would

generally propose the “sure thing” rather than take a chance on a less likely off-beat idea. This state of affairs created a less than ideal climate for generating innovative ideas. I told them that one way to be more creative is to:

Look for the second right answer.

Often, it is the second right answer which, although off-beat or unusual, is exactly what you need to solve a problem in an innovative way.

One technique for finding the second right answer is to change the questions you use to probe a problem. For example, how many times have you heard someone say, “What is the answer?” or “What is the meaning of this?” or “What is the result?” These people are looking for *the* answer, and *the* meaning, and *the* result. And that’s all they’ll find — just one. If you train yourself to ask questions that solicit plural answers like “What are the answers?” or “What are the meanings?” or “What are the results?” you will find that people will think a little more deeply and offer more than one idea. As the Nobel Prize winning chemist Linus Pauling put it:

The best way to get a good idea is to get a lot of ideas.

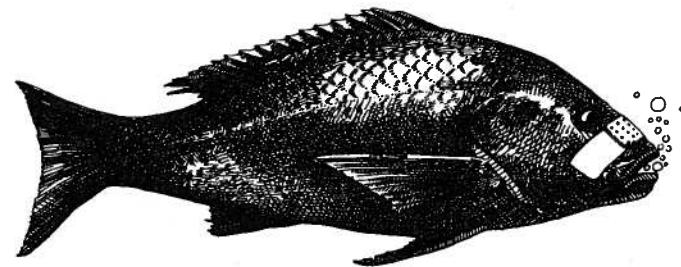
You may not be able to use all of them, but out of the number you generate you may find a few that are worthwhile. This is why professional photographers take so many pictures when shooting an important subject. They may take twenty, sixty or a hundred shots. They’ll change the exposure, the lighting, the filters, and so on. That’s because they know that out of all the pictures they take, there may be only a few that capture what

they’re looking for. It’s the same thing with creative thinking: you need to generate a lot of ideas to get some good ones.

Inventor Ray Dolby (the man who took “hiss” out of recorded music) has a similar philosophy. He says:

Inventing is a skill that some people have and some people don’t. But you can learn how to invent. You have to have the will not to jump at the first solution, because the really elegant solution might be right around the corner. An inventor is someone who says, “Yes, that’s one way to do it, but it doesn’t seem to be an optimum solution.” Then he keeps on thinking.

When you look for more than one right answer, you allow your imagination to open up. How do you keep a fish from smelling? Cook it as soon as you catch it. Freeze it. Wrap it in paper. Leave it in the water. Switch to chicken. Keep a cat around. Burn incense. Cut its nose off.

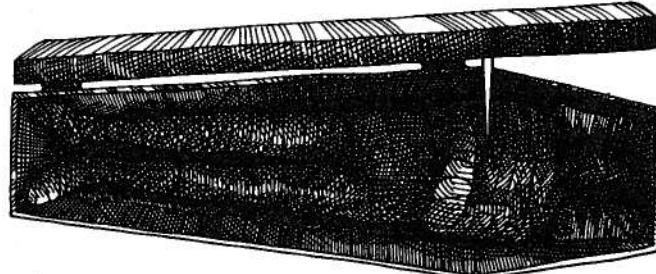


One technique for finding more answers is to change the wording in your questions. If an architect looks at an opening between two rooms and thinks, “What type of *door* should I use to connect these rooms?” that’s what she’ll design — a door. But if she thinks “What sort of *passageway* should I put here?” she may design something different like a “hallway,” an “air curtain,” a “tunnel,” or perhaps a “courtyard.” Different words bring in different assumptions and lead your thinking in different directions.

Here's an example of how such a strategy can work. Several centuries ago, a curious but deadly plague appeared in a small village in Lithuania. What was curious about this disease was its grip on its victim; as soon as a person contracted it, he'd go into a deep almost deathlike coma. Most died within a day, but occasionally a hardy soul would make it back to the full bloom of health. The problem was that since eighteenth century medical technology wasn't very advanced, the unafflicted had quite a difficult time telling whether a victim was dead or alive.

Then one day it was discovered that someone had been buried alive. This alarmed the townspeople, so they called a town meeting to decide what should be done to prevent such a situation from happening again. After much discussion, most people agreed on the following solution. They decided to put food and water in every casket next to the body. They would even put an air hole from the casket up to the earth's surface. These procedures would be expensive, but they would be more than worthwhile if they would save people's lives.

Another group came up with a second, less expensive, right answer. They proposed implanting a twelve inch long stake in every coffin lid directly above where the victim's heart would be. Then whatever doubts there were about whether the person was dead or alive would be eliminated as soon the coffin lid was closed. What differentiated the two solutions were the questions used to find them. Whereas the first group asked, "What should we do if we bury somebody *alive*?" the second group wondered, "How can we make sure everyone we bury is *dead*?"



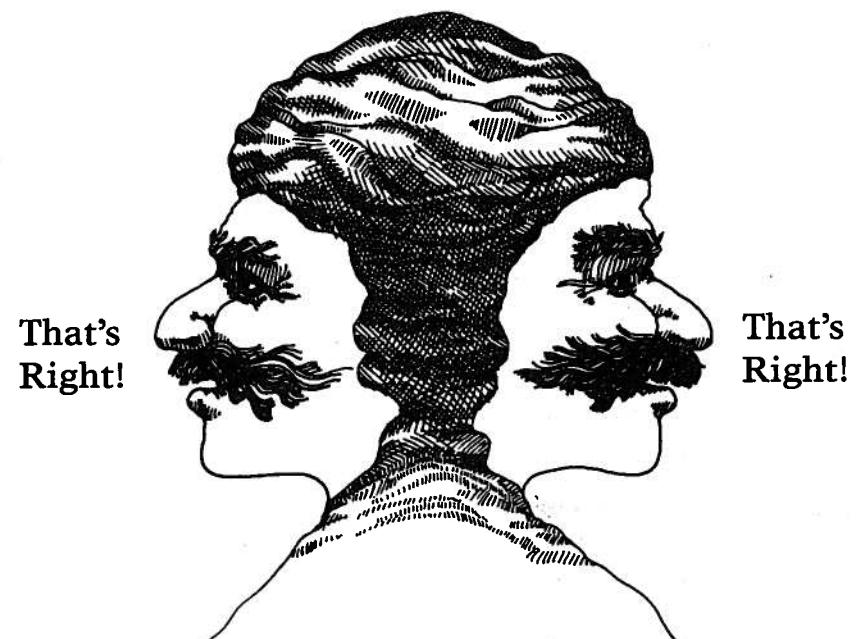
I'd like to conclude this "right answer" chapter with one of my favorite Sufi stories.

Two men had an argument. To settle the matter, they went to a Sufi judge for arbitration. The plaintiff made his case. He was very eloquent and persuasive in his reasoning. When he finished, the judge nodded in approval and said, "That's right, that's right."

On hearing this, the defendant jumped up and said, "Wait a second, judge, you haven't even heard my side of the case yet." So the judge told the defendant to state his case. He, too, was very persuasive and eloquent. When he finished, the judge said, "That's right, that's right."

When the clerk of court heard this, he jumped up and said, "Judge, they both can't be right." The judge looked at the clerk and said, "That's right, that's right."

Moral: Truth is all around you; what matters is where you place your focus.



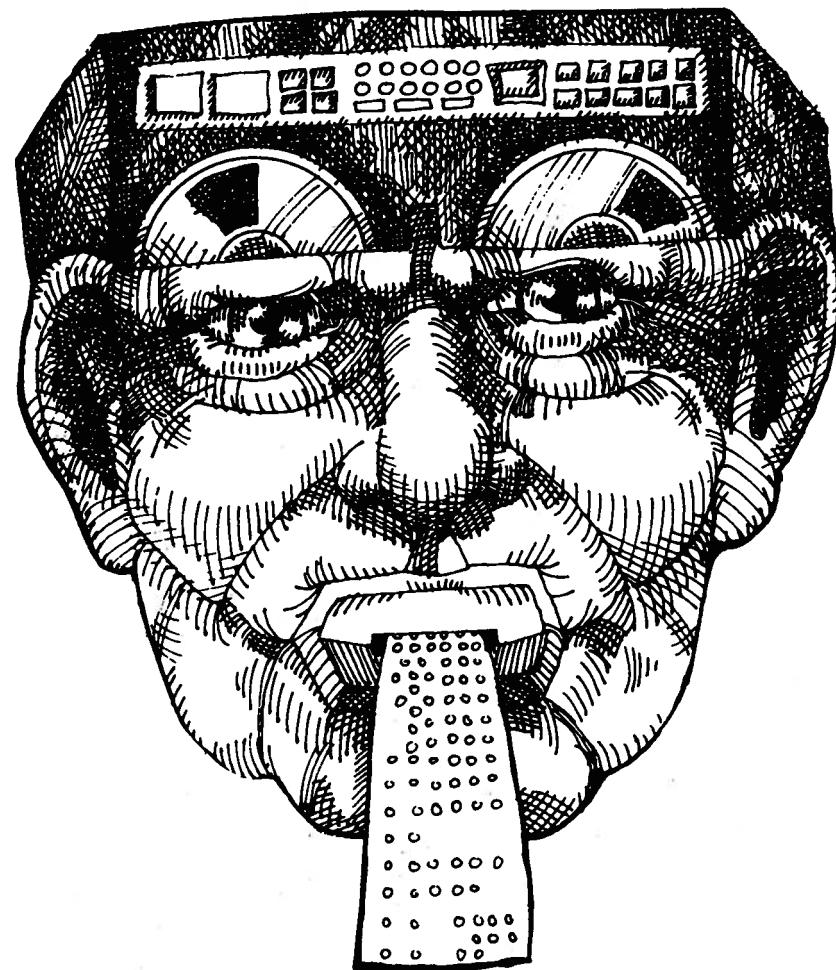
Summary

Much of our educational system has taught us to look for the one right answer. This approach is fine for some situations, but many of us have a tendency to stop looking for alternative right answers after the first right answer has been found. This is unfortunate because often it's the second, or third, or tenth right answer which is what we need to solve a problem in an innovative way.

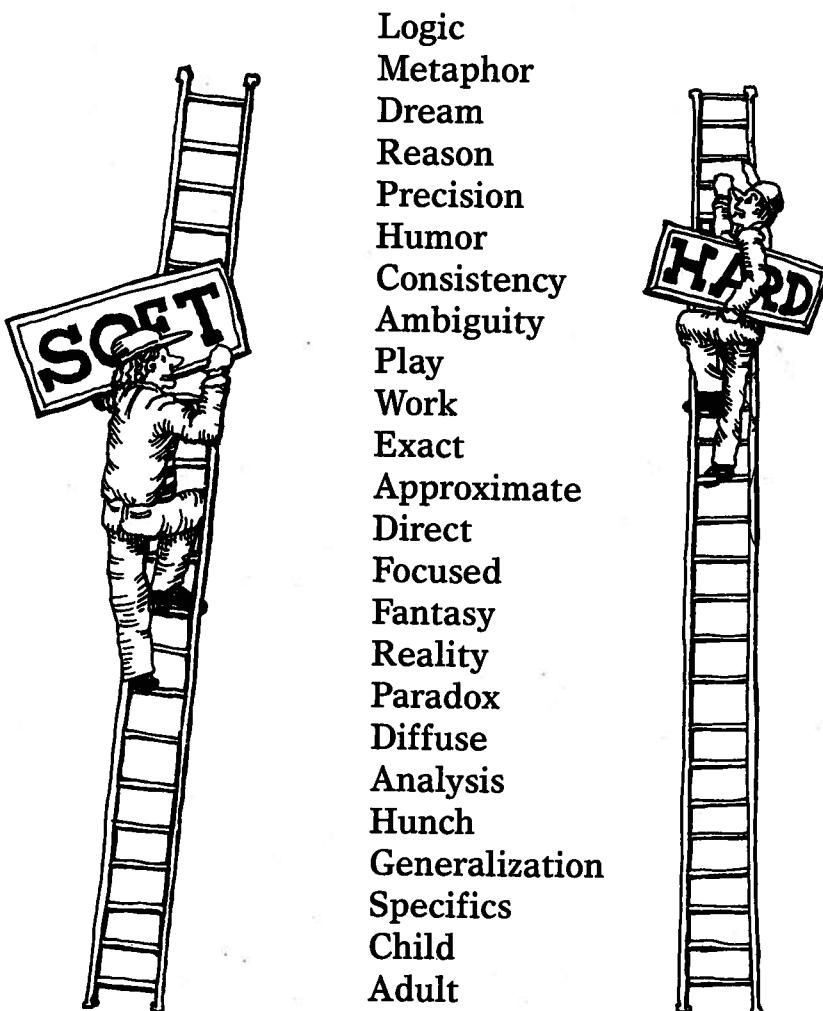
There are many ways to find the second right answer — asking "what if," playing the fool, reversing the problem, breaking the rules, etc. Indeed, that's what much of this book is about. The important thing, however, is to look for the second right answer, because unless you do, you won't find it.

TIP: The answers you get depend on the questions you ask. Play with your wording to get different answers. One technique is to solicit plural answers. Another is to ask questions that whack people's thinking. One woman told me that she had a manager who would keep her mind on its toes by asking questions such as: "What are three things you feel totally neutral about?" and "Which parts of your problem do you associate with tax returns and which parts with poetry?"

2. That's Not Logical



Exercise: Take a blank sheet of paper and draw a vertical line down the center. On the top left, write the word “Soft,” and on the top right write the word “Hard.” Now take a moment and look at the following concepts. Those you associate with being soft, put in the “Soft” column. Those you associate with being hard, put in the “Hard” column. This is a subjective exercise, but you should have a general feeling for soft and hard things.



Now take a moment to think about this question: how would you compare the “Hard” list with the “Soft” one? Objective versus subjective? Quantitative versus qualitative? Masculine versus feminine?

Soft and Hard Thinking

At this point, you might be wondering about the purpose of this exercise. Well, the difference between soft and hard helped solve a problem for me. Not long ago, I stayed up late one night and tried to think of all the different types of thinking there are. Here’s a partial list:

- | | |
|-----------------------|-------------------------|
| Logical thinking | Mythical thinking |
| Conceptual thinking | Poetic thinking |
| Analytical thinking | Non-verbal thinking |
| Primitive thinking | Analogical thinking |
| Critical thinking | Lyrical thinking |
| Foolish thinking | Practical thinking |
| Convergent thinking | Divergent thinking |
| Weird thinking | Ambiguous thinking |
| Reflective thinking | Constructive thinking |
| Visual thinking | Thinking about thinking |
| Symbolic thinking | Surreal thinking |
| Digital thinking | Concrete thinking |
| Metaphorical thinking | Fantasy thinking |

I must have thought of close to a hundred different types of thinking. Then I asked myself, “How can I order them? What patterns do they have in common?” I thought about these questions for some time, but came up empty.

I was about to go to bed when I remembered the words of Kenneth Boulding. Boulding was an economist by profession, but more than that, he was a student of life. What he said was this:

There are two kinds of people in this world: those who divide everything into two groups, and those who don't.

At that moment I was feeling like a member of the former group. I thought: "Why not apply this binary insight to the different types of thinking and divide them into two groups?" But what would the differentiating factors be? I thought of opposites: good/bad, strong/weak, inside/outside, big/small, masculine/feminine, living/dying, and so on, but none of these expressed what I was looking for. And then it hit me: why not Soft and Hard?

If you are like a lot of people, your "Soft" and "Hard" lists probably looked something like this:

Soft

- Metaphor
- Dream
- Humor
- Ambiguity
- Play
- Approximate
- Fantasy
- Paradox
- Diffuse
- Hunch
- Generalization
- Child

Hard

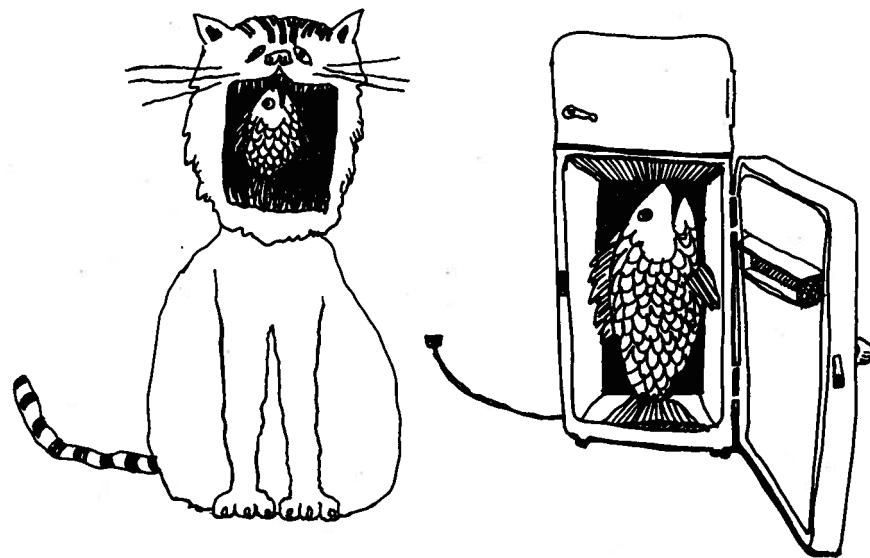
- Logic
- Reason
- Precision
- Consistency
- Work
- Exact
- Reality
- Direct
- Focused
- Analysis
- Specific
- Adult

As you can see, things on the hard side have a definite right and wrong answer; on the soft side, there may be many right answers. On the hard side, things are black and white; on the soft side there are many shades of gray (to say nothing of orange, purple, and magenta!). A few of you might say that you can pick up the things on the hard side — like a bar of metal.

The soft things are a little more difficult to grab onto — like a handful of water.

Soft thinking has many of the characteristics on the "Soft" list: it is metaphorical, approximate, humorous, playful, and capable of dealing with contradiction. Hard thinking, on the other hand, tends to be more logical, precise, exact, specific, and consistent. We might say that hard thinking is like a spotlight. It is bright, clear, and intense, but the focus is narrow. Soft thinking is like a floodlight. It is more diffuse, not as intense, but covers a wider area.

Soft thinking tries to find similarities and connections among things, while hard thinking focuses on their differences. For example, a soft thinker might say that a cat and refrigerator have a lot in common, and then proceed to point out their similarities (they both have a place to put fish, they both have tails, they both come in a variety of colors, they both purr, they both have a lifetime of about fifteen years, etc.). The hard thinker would establish the cat and the refrigerator as being part of two different sets.



A person using soft thinking might ask a question such as, "What would furniture look like if our knees bent the other way?" The hard thinker would say, "What materials should be used in manufacturing to optimize the rate of return on this new line of chairs?"

The Creative Process

Where do you use soft and hard thinking? To answer this question, we should turn to the creative process. There are two main phases in the development of new ideas: an "imaginative" phase and a "practical" one.

In the imaginative phase, you generate and play with ideas. In the practical phase, you evaluate and execute them. To use a biological metaphor, the imaginative phase sprouts the new ideas and the practical phase cultivates and harvests them.

In the imaginative phase, you ask questions such as: What if? Why not? What rules can we break? What assumptions can we drop? How about if we looked at this backwards? Can we borrow a metaphor from another discipline? The motto of the imaginative phase is: "Thinking something different."

In the practical phase, you ask questions such as: Is this idea any good? Do we have the resources to implement it? Is the timing right? Who can help us? What's the deadline? What are the consequences of not reaching the objective? The motto of the practical phase is: "Getting something done."

Both types of thinking play an important role in the creative process, but usually during different phases. Soft thinking is effective in the imaginative phase when you are searching for new ideas, and manipulating problems. Hard thinking, on the other hand, is best used in the practical phase when you are evaluating ideas, narrowing in on practical solutions, running risk-analyses, and preparing to carry the idea into action.

A good analogy for the need for both types of thinking in the creative process is a potter making a vase. If you've ever done any work with clay, you know that it's a lot easier to shape, mold, and throw the clay if it has some softness to it (brittle clay is hard to shape). By the same token, after the vase has been shaped, it has no practical value until it has been put into a kiln and fired. Both the soft and the hard elements are required but at different times.



If soft and hard thinking have their strengths, they also have their weaknesses. Thus, it is important to know when each is *not* appropriate. Soft thinking in the practical phase can prevent the execution of an idea; here firmness and directness are preferable to ambiguity and dreams. Conversely, hard thinking in the imaginative phase can limit the creative process. Logic and analysis are important tools, but an overreliance on them — especially early in the creative process — can prematurely narrow your thinking.

That's Not Logical

The first and supreme principle of traditional logic is the law of noncontradiction. Logic can comprehend only those things that have a consistent and non-contradictory nature. This is fine except that most of life is ambiguous: inconsistency and contradiction are the hallmarks of human existence. As a result, the number of things that can be thought about in a logical manner is small, and an overemphasis on the logical method can inhibit your thinking.

Some people, however, have little use for soft thinking. Their feeling toward it is "that's not logical." When faced with a problem, they immediately bring in their hard thinking strategies. They say, "Let's get down to brass tacks." They never give themselves an opportunity to consider steel tacks, copper tacks, plastic tacks, sailing tacks, income tax, syntax, or contacts. If you use a little soft thinking early in the creative process, you may still end up going with the "brass tacks," but at least you will have considered alternatives.

Our educational system does a fairly good job of developing hard thinking skills, but there is not much to develop soft thinking. As a matter of fact, much of our education is geared toward eliminating soft thinking, or at best, teaching us to regard it as an inferior tool. Human intelligence is a complicated phenomenon, and yet many of our formal notions of intelligence are based on logic and analysis. Musical ability, decorating, painting, and cooking seem to have no place in many test makers' conceptions of intelligence. As creativity educator Edward de Bono points out, "If someone says he has learned to think, most of us assume that he means he has learned to think logically."

There is another reason for the "that's not logical" mental lock. As an historian of ideas, I've noticed that the models people use to understand mental processes reflect the technology of

their time. For example, in the 17th century, people thought about the mind as though it were a mirror or a lens, and this "reflects" the advances made then in the fields of optics and lens making. The Freudian model of mind, developed in the late 19th and early 20th centuries, seems based on the ubiquity of the steam engine locomotive. Ideas billow up from the subconscious to the conscious in the same way steam moves from boiler to compression chamber. In the early twentieth century, the mind was viewed by some as a vast telephone switching network with circuits and relays running through the brain.

For the past thirty years, we've had a new model of mind: the computer. This model does a good job of describing certain aspects of our thinking. For example, we have "input" and "output" and "information processing." There is also "feedback," "programming," and "storage."

This is fine as far as it goes, but some people take this model literally and think that the mind really *is* a computer. Indeed, they may not only dismiss the soft types of thinking for not being "logical," but even treat other people like machines.

I believe that the mind is not only a computer that processes information, it's also a museum that stores experiences, a device that encodes holograms, a playground in which to play, a muscle to be strengthened, a workshop in which to construct thoughts, a debating opponent to be won over, a cat to be stroked, a funhouse to be explored, a compost pile to be turned, and forty-three others. There are a lot of right ways to model the mind all depending on what you think is important.

One of the saddest consequences of the "that's not logical" mental lock is that its prisoner may not pay attention to one of the mind's softest and most valuable creations: the intuitive hunch. Your mind is constantly recording, connecting, and storing unrelated knowledge, experiences, and feelings. Later, it combines this disparate information into answers — hunches — to the problems you're facing, if you simply ask, trust, and

listen. These hunches, for no apparent logical reason, might lead you to trying a different problem-solving approach, going out on a blind date, betting on the underdog in a sporting event, taking a spontaneous vacation, or ignoring a trusted friend's advice.

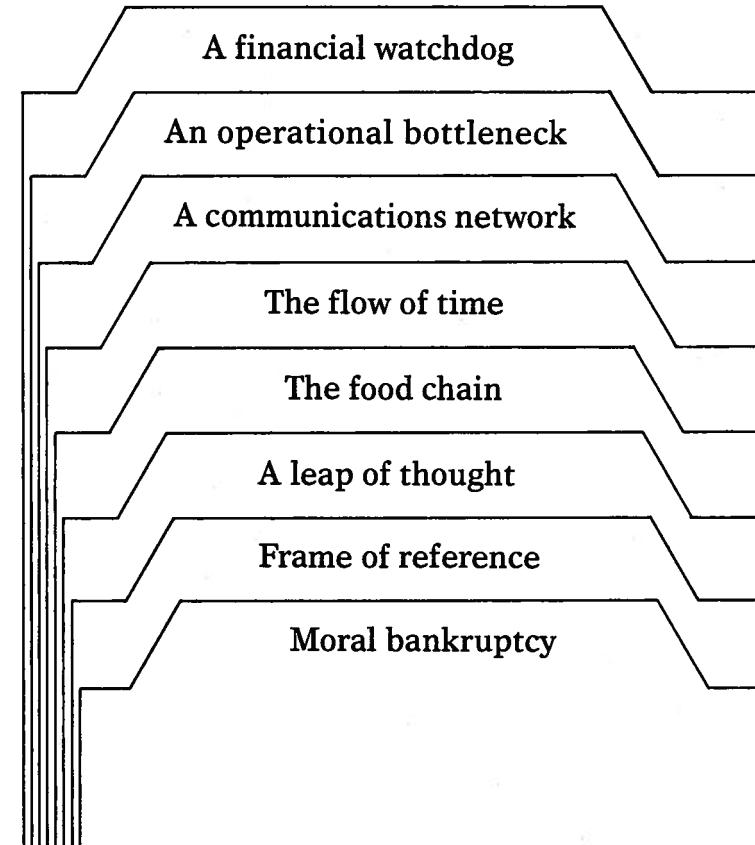
Exercise: What hunches have you had recently? Which ones did you listen to? How did things work out? What decision are you currently facing? What does your gut tell you to do?



Making the Strange Familiar

To combat the dangers of creative rigor mortis due to excessive hard thinking, I would like to introduce one of my favorite soft thinking tools. I'll introduce it with an exercise. As you do this exercise, think of yourself as a poet. This is a high compliment: our word poet comes from the classical Greek word *poietes* which meant not only "poet" but also "creator."

Exercise: What do the following have in common?

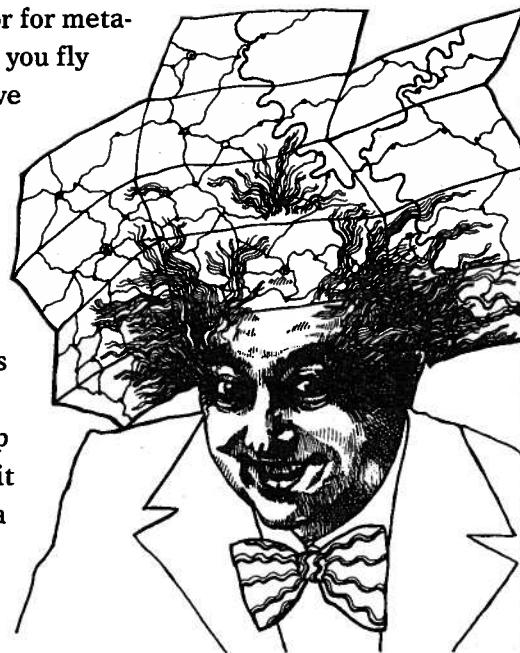


In addition to everything else, they are all metaphors. They all connect two very different universes of meaning through some similarity they share. In doing so, metaphors help us to understand one idea by means of another. For example, we understand the nature of a particular financial function by comparing it to a watchdog (they both protect), the passing of time to a river (flow), and the feeding interrelationship of the animal world to a chain (links).

The key to metaphorical thinking is similarity. In fact, this is how our thinking grows: we understand the unfamiliar by means of the similarities it has with what is familiar to us. For example, what were the first automobiles called? That's right, "horseless carriages." And the first locomotives were called "iron horses." We refer to resemblances between things all of the time. We say that hammers have "heads," tables have "legs," roads have "shoulders," cities have "hearts," and beds have "feet." It's all very soft, but it is how we think.

How about a metaphor for metaphors? Let's suppose that you fly to Chicago, and that you've never been there before.

You get off the airplane and rent a car. What's the first thing you do? Get a map of the city to see how it's laid out, to find out where the streets are, and to see where the sites are located. The map itself is not Chicago, but it does give you a basic idea of the structure of the city. So, a metaphor is a mental map.



Metaphors are quite useful in helping you get a different slant on a problem. For example, in the 17th century William Harvey looked at the heart not as a muscle or an organ, but as a "pump." This led to his discovery of the circulation of blood. In the early twentieth century, Danish physicist Niels Bohr developed a new model of the atom by comparing it to the solar system. Within this framework, he figured that the sun represented the nucleus and the planets represented the electrons.

Another example: several years ago I had a client whose sales were flat even though there was a boom in the marketplace for the products they offered. We decided to make a metaphor for their company. We decided that their company was like a full service restaurant. Its menu (product line) was large, but there were many restrictions on what could be purchased — for example, a customer could not order chili with veal. Since the individual chefs (division managers) decided what was on the menu, there was no consistency in their offerings. This led to their having specialized waiters (salespeople). A typical result? A customer couldn't buy pasta from a steak waiter or hot dogs from a fish waiter. We developed this metaphor further, but it quickly became clear to us that the large, restricted product line confused their customers, and was the main source of their flat sales.

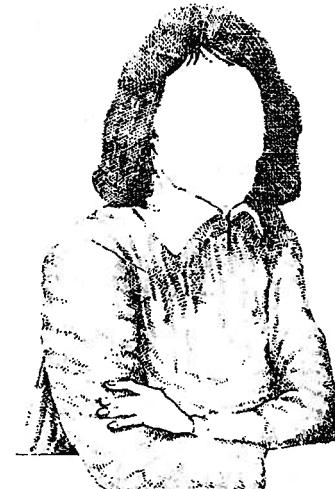
Metaphors are also effective in making complex ideas easier to understand. Some years ago, I had to memorize the various parts of a computer operating system. I didn't want to memorize all the details but I did need to know the various relationships of the parts to one another. So I said to myself, "Why don't I make a metaphor? This operating system is like an automobile. This part is like the chassis, this part is like the engine, this part is like the steering wheel, and so on." Whenever I needed to remember the operating system, I just brought to mind my metaphorical picture of the automobile.

Exercise: Make a metaphor for a problem you're currently dealing with or a concept you're developing. To do it, simply compare your concept to something else and then see what similarities you can find between the two ideas. Basically, you're using one idea to highlight another. See how far you can extend the comparison.

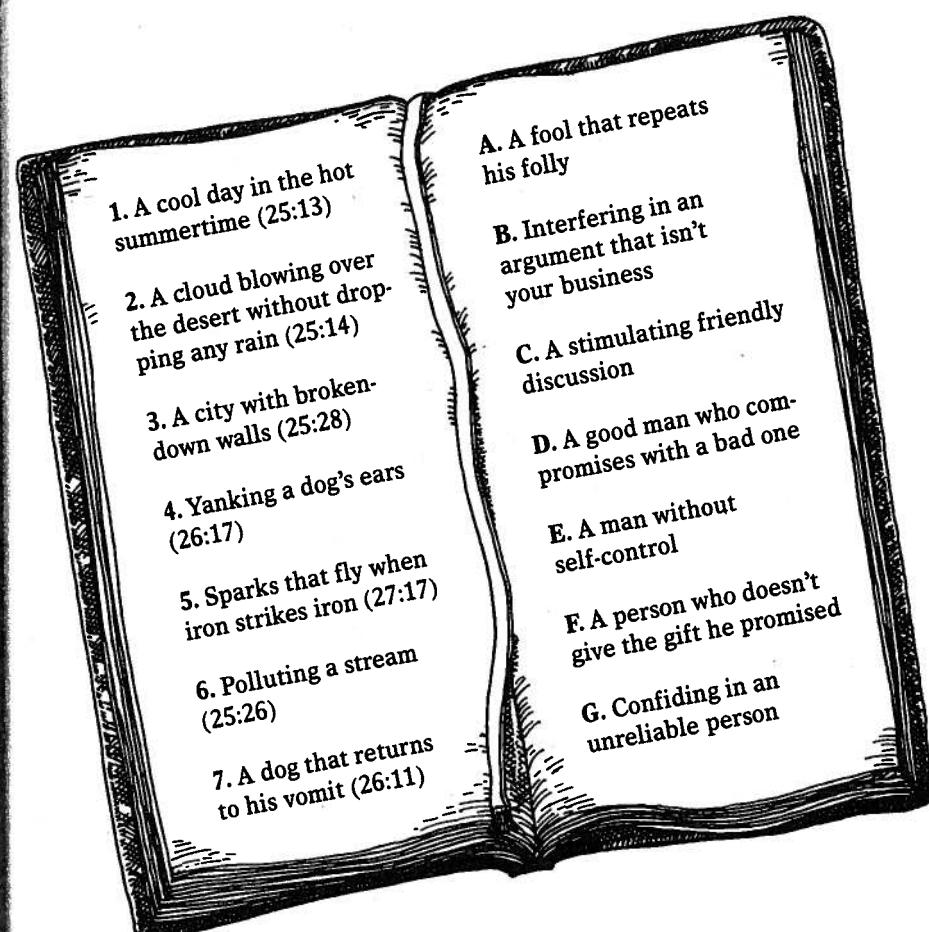
I've found that some of the most fertile (and easiest to develop) metaphors are those in which there is some action taking place. You might try comparing your concept to several of these:

- Running for political office
- Disciplining a ten year old
- Cooking a fancy meal
- Fighting the government
- Starting a revolution
- Negotiating a contract
- Going fishing
- Putting out a fire
- Fighting a disease
- Doing standup comedy
- Conducting an orchestra
- Making a sales call
- Courting a mate

- Going on a diet
- Performing a magic trick
- Colonizing a territory
- Building a house
- Spreading propaganda
- Prospecting for gold
- Planting a garden
- Having a baby
- Arranging flowers
- Impersonating the 17th c. French mathematician Rene Descartes and then Disappearing



Exercise: The Bible is quite metaphorical. Whether it's Jesus talking in parables or the prophets using similes to foretell the future, you'll find many ideas expressed metaphorically. This is particularly true in the *Book of Proverbs*. Here is a quiz from *Proverbs*. Connect the metaphor on the left side with the idea it represents on the right side.



The Meaning of Life

As you may have guessed by now, metaphors are one of my passions, and so I hope you'll excuse me for one more metaphorical indulgence.

One question I have is, "What is the meaning of life?" To find the answer, I have asked my seminar participants to make a metaphor for life. Their ideas can be put into two groups: those that deal with food, and those that don't. Here is the meaning of life:



Life is like a bagel. It's delicious when it's fresh and warm, but often it's just hard. The hole in the middle is its great mystery, and yet it wouldn't be a bagel without it.



Life is like eating grapefruit. First you have to break through the skin; then it takes a couple of bites to get used to the taste, and just as you begin to enjoy it, it squirts you in the eye.



Life is like a banana. You start out green and get soft and mushy with age. Some people want to be one of the bunch while others want to be top banana. You have to take care not to slip on externals. And, finally, you have to strip off the outer coating to get at the meat.



Life is like cooking. It all depends on what you add and how you mix it. Sometimes you follow the recipe and at other times, you're creative.



Life is like a jigsaw puzzle, but you don't have the picture on the front of the box to know what it's supposed to look like. Sometimes, you're not even sure if you have all the pieces.



Life is like a maze in which you try to avoid the exit.



Life is like riding an elevator. It has lots of ups and downs and someone is always pushing your buttons. Sometimes you get the shaft, but what really bothers you are the jerks.



Life is like a poker game. You deal or are dealt to. It includes skill and luck. You bet, check, bluff, and raise. You learn from those you play with. Sometimes, you win with a pair or lose with a full house. But whatever happens, it's best to keep on shuffling along.



Life is like a puppy dog always searching for a street full of fire hydrants.



Life is like a room full of open doors that close as you get older.

What do you think life is like?

Summary

Logic is an important creative thinking tool. Its use is especially appropriate in the practical phase of the creative process when you are evaluating ideas and preparing them for action. When you're searching for and playing with ideas, however, excessive logical thinking can short-circuit your creative process. That's because the imaginative phase is governed by a different logic that is best described as metaphorical, fantastic, elliptical, and ambiguous.

For more and better ideas, I prescribe a good dose of soft thinking in the imaginative phase of the creative process, and a hearty helping of hard thinking in the practical phase.

TIP: The metaphor is an excellent tool to help you “think something different.” Think of yourself as a poet, and look for similarities around you. If you have a problem, make a metaphor. This should give you a fresh slant on it.

TIP: Go on “metaphor hunts.” Pay attention to the metaphors people use to describe what they are doing. For example, have you ever noticed how meteorologists use the “War Model of Weather” to describe their science?

TIP: Pay attention to the metaphors you use in your own thinking. As glorious a tool as metaphors are, they can easily imprison your thinking if you’re not aware how much they’re guiding your thoughts.

TIP: Remember, it’s an illogical world. The glow worm isn’t a worm. A firefly isn’t a fly. The English horn isn’t English (French) or a horn (woodwind). The Harlem Globetrotters didn’t play a game in Harlem until they’d been playing for forty years. We name or refer to things not to be precise, but to grasp a sense of them.

3. Follow the Rules



Summary

Most of us have learned to “avoid ambiguity” because of the communication problems it can cause. This is an especially good idea in practical situations where the consequences of such a misunderstanding would be serious. For example, a fire chief fighting a three-alarm fire needs to issue his orders with utmost clarity so as to leave nothing to question.

In imaginative situations, however, there is the danger that too much specificity can stifle your imagination. Let’s suppose that the same fire chief has asked you to paint a mural on the side of his firehouse. If he tells you what he wants it to look like right down to the last detail, he hasn’t given you any room for your imagination. Perhaps, if the assignment were stated somewhat ambiguously, then you would have more room to think and be creative. In other words, there is a place for ambiguity — perhaps not so much when you’re evaluating and executing ideas, but certainly when you’re searching for and playing with them.

TIP: Take advantage of the ambiguity in the world. Look at something and think about what else it might be.

TIP: If you’re giving someone a problem that has the potential of being solved in a creative way, then you might try—at least initially — posing it in an ambiguous fashion so as not to restrict their imagination.

TIP: Let the world be your oracle. Allow random, unexpected information to stimulate your imagination.

TIP: Listen to your dreams.

9. To Err Is Wrong



Hits and Misses

In the summer of 1979, Boston Red Sox first baseman Carl Yastrzemski became the fifteenth player in baseball history to reach the three thousand hit plateau. This event drew a lot of media attention, and for about a week prior to the attainment of this goal, hundreds of reporters covered Yaz's every move. Finally, one reporter asked, "Hey Yaz, aren't you afraid all of this attention will go to your head?" Yastrzemski replied, "I look at it this way: in my career I've been up to bat over ten thousand times. That means I've been unsuccessful at the plate over seven thousand times. That fact alone keeps me from getting a swollen head."

Most people consider success and failure as opposites, but they are actually both products of the same process. As Yaz suggests, an activity that produces a hit may also produce a miss. It's the same with creative thinking. The same energy that generates creative ideas also produces errors.

Many people are not comfortable with errors. Our educational system, based on the "right answer" belief, cultivates our thinking in another, more conservative way. From an early age, we are taught that right answers are good and incorrect answers are bad. This value is deeply embedded in the incentive system used in most schools:

Right over 90% of the time = "A"

Right over 80% of the time = "B"

Right over 70% of the time = "C"

Right over 60% of the time = "D"

Less than 60% correct, you fail

From this we learn to be right as often as possible and to keep our mistakes to a minimum. We learn, in other words, that "to err is wrong."

With this attitude, you won't be taking many chances. If you learn that failing even a little penalizes you (e.g., being wrong only 15% of the time garners you only a "B" performance), you learn not to make mistakes. And more important, you learn not to put yourself in situations where you might fail. This leads to conservative thought patterns designed to avoid "failure."

I have a friend who graduated from college with a master's degree in journalism. For six months, she tried to find a job, but to no avail. I talked with her about her situation, and realized that her problem was that she didn't know how to fail. She went through eighteen years of schooling without ever failing an examination, a paper, a midterm, a pop-quiz, or a final. So she was reluctant to try any approaches where she might fail. She had been conditioned to believe that failure is bad in and of itself, rather than a stepping stone to new ideas. Look around. How many people do you see who are afraid to try something new because of this fear of failure? Most of us have learned not to make mistakes in public. As a result, we remove ourselves from many learning experiences except for those occurring in the most private of circumstances.



A Different Logic

A man's errors are his portals of discovery.

— James Joyce, Author

From a practical standpoint, "to err is wrong" makes sense. Our survival in the everyday world requires us to perform thousands of small tasks without much thought. Think about it: you wouldn't last very long if you were to step out in front of traffic or stick your hand into a pot of boiling water. In addition, engineers whose bridges collapse, stock brokers who lose money for their clients, and copywriters whose ad campaigns decrease sales won't keep their jobs very long.

Nevertheless, too great an adherence to the belief "to err is wrong" can greatly undermine your attempts to generate new ideas. If you're more concerned with producing right answers than generating original ideas, you'll probably make uncritical use of the rules, formulae, and procedures used to obtain these right answers. By doing this, you'll bypass the imaginative phase of the creative process, and thus spend little time testing assumptions, challenging the rules, asking what if, or just plain fooling around with the problem. All of these techniques will produce some incorrect answers, but in the imaginative phase errors are a necessary by-product of creative thinking. As Yaz would put it, "If you want the hits, be prepared for the misses." That's the way the game of life goes.

Whenever an error pops up, the usual response is "Jeez, another screwup, what went wrong this time?" The creative thinker, on the other hand, will realize the potential value of errors, and perhaps say something like, "Would you look at that! Where can it lead our thinking?" And then he or she will go on to use the error as a stepping stone to a new idea. As a matter of fact, the whole history of discovery is filled with people who used

erroneous assumptions and failed ideas as stepping stones to new ideas. Columbus thought he was finding a shorter route to India. Johannes Kepler stumbled on to the idea of interplanetary gravity because of assumptions which were right for the wrong reasons. Thomas Edison knew 1,800 ways *not* to build a light bulb. Freud had several big failures before he developed psychoanalysis. One of Madame Curie's failures was radium.

Automotive inventor Charles Kettering, one of the 20th century's great creative minds, had this to say about the value of learning to fail:

An inventor is simply a person who doesn't take his education too seriously. You see, from the time a person is six years old until he graduates from college he has to take three or four examinations a year. If he flunks once, he is out. But an inventor is almost always failing. He tries and fails maybe a thousand times. If he succeeds once then he's in. These two things are diametrically opposite. We often say that the biggest job we have is to teach a newly hired employee how to fail intelligently. We have to train him to experiment over and over and to keep on trying and failing until he learns what will work.

Nature serves as a good example of how trial and error can be used to make changes. Every now and then genetic mutations occur — errors in gene reproduction. Most of the time, these mutations have a deleterious effect on the species, and they drop out of the gene pool. But occasionally, a mutation provides the species with something beneficial, and that change will be passed on to future generations. The rich variety of all species is due to this trial and error process. If there had never been any mutations from the first amoeba, where would we be now?

Is Failure Bad?

If you hit every time, the target is too near or too big.

—Tom Hirshfield, Physicist

Your error rate in any activity is a function of your familiarity with that activity. If you are doing things that are routine for you, then you will probably make very few errors. But if you are doing things that have no precedence in your experience or are trying different approaches, then you will be making your share of mistakes. Innovators may not bat a thousand — far from it — but they do get new ideas.

Errors serve a useful purpose: they tell us when to change direction. When things go smoothly, we generally don't think about them. To a great extent, this is because we function according to the principle of negative feedback. Often it is only when things or people fail to do their job that they get our attention. For example, you are probably not thinking about your kneecaps right now. That's because everything is fine with them. The same goes for your elbows: they are also performing their function — no problem at all. But if you were to break a leg, you would immediately notice all the things you could no longer do, but which you used to take for granted.

Negative feedback means that the current approach is not working, and it is up to you to find a new one. We learn by trial and error, not by trial and rightness. If we did things correctly every time, we would never have to change course, and we'd end up with more of the same.

After the supertanker *Exxon Valdez* broke open off of Alaska in the spring of 1989, thereby polluting the coast with millions of gallons of oil, the oil industry was forced to rethink and toughen up many of its safety standards regarding petroleum transport. The same thing happened after the accident at the

Three Mile Island nuclear reactor in 1979 — many safety standards were changed. The explosion of the *Challenger* space shuttle caused a similar thing to happen. Similarly, the sinking of the *Titanic* led to the creation of the International Ice Patrol, and legally mandated iceberg reporting.

I like to ask people if they've ever been fired from a job. If they have, they typically say something along the lines of "Yeah, it was really traumatic, but it turned out to be the best thing that ever happened to me. It forced me to come to grips with who I was as a person. I had to look at my strengths and weaknesses with no delusions at all. It forced me to get out of my box and scramble. Six months later, I was in a much better situation."

We learn by our failures. A person's errors are the whacks that lead him or her to think something different.

Is Success Good?

This leads to another question: Is success a good thing? Sometimes the answer isn't so obvious. Just as it's possible that failure can lead to something good, sometimes success can lead to something bad. There are two ways in which this can happen.

First, success tends to lock you in a pattern, and you get the attitude, "If it's not broken, why fix it?" This attitude prevents you from experimenting and trying other approaches that in the long run may do you a lot more good.

Second, success — perversely enough — can create situations that undermine your original intentions and end up creating bigger problems than the ones you started with.

Here are some examples:

◆ In preparing for the Olympics, the coach of a leading crew team invited a meditation instructor to teach awareness techniques to his crew. He hoped that such training would enhance their rowing effectiveness and improve their sense of unity. As the crew learned more about meditation, they became more synchronized, their strokes got smoother, and there was less resistance. The irony is that their performance decreased and they went slower. It turned out that the crew was more interested in being in harmony than in winning. So the meditation teacher was dismissed.



◆ During the Soviet-Afghanistan war, the Soviets believed that their savage attacks on the civilian population would intimidate the Afghans into submission. Ironically, their attacks had just the opposite result. Because Afghan warriors historically stayed close to home to guard their women and children, the Soviets' driving Afghan dependents into refugee camps liberated the Mujahideen from family responsibilities and turned them into formidable opponents.

◆ France's mobilization efforts in the first weeks of World War II were so successful that tens of thousands of key workers in vital war industries enlisted. As a result, these industries were practically brought to a halt, thereby placing the country at even greater risk. Several months later, the new recruits were returned to their jobs.

◆ In the mid-1960's, the Japanese resort town of Atami lobbied hard to get a high-speed "bullet train" link to Tokyo, then three hours away. After the railway was completed, tourism declined — in part because the romance of going away for the weekend was lost in a place that could be reached in only fifty minutes.

Is success good? Is failure bad? Well, like Yaz, I'd rather have a higher batting average than a lower one. Nonetheless, as I look back over my life, I find that I was successful at some endeavors where I would have been better off had I failed. That's because the success prevented me from experimenting and trying different approaches. Conversely, there are places where I'm glad I failed because it forced me to look for a second right answer that, in hindsight, was much preferable to the first.

Summary

There are places where errors are inappropriate, but the imaginative phase of the creative process isn't one of them. Errors are a sign that you are diverging from the well-traveled path. A large part of creative thinking is not being afraid to fail. As director Woody Allen put it, "If you're not failing every now and again, it's a sign you're not trying anything very innovative."

Remember these two benefits of failure. First, if you do fail, you learn what doesn't work. Second, the failure gives you an opportunity to try a new approach.

TIP: If you make an error, use it as a stepping stone to an idea you might not otherwise have discovered.

TIP: Differentiate between errors of "commission" and those of "omission." The latter can be more costly than the former. If you're not making many errors, you might ask yourself, "How many opportunities am I missing by not being more aggressive."

TIP: Before embarking on an idea or project, ask yourself: "What bad things can happen if we're successful?"

10. I'm Not Creative

