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DEDUCTION AND INDUCTION: THE DIFFERENCE

Briefly, the difference is as shown in Exhibit 17. Deduction presents a line of reasoning that leads to a 'therefore' conclusion, and the point above is a summary of that line of reasoning, resting heavily on the final point. Induction defines a group of facts or ideas to be the same kind of thing, and then makes a statement (or inference) about that sameness. The deductive points derive from each other; the inductive points do not.

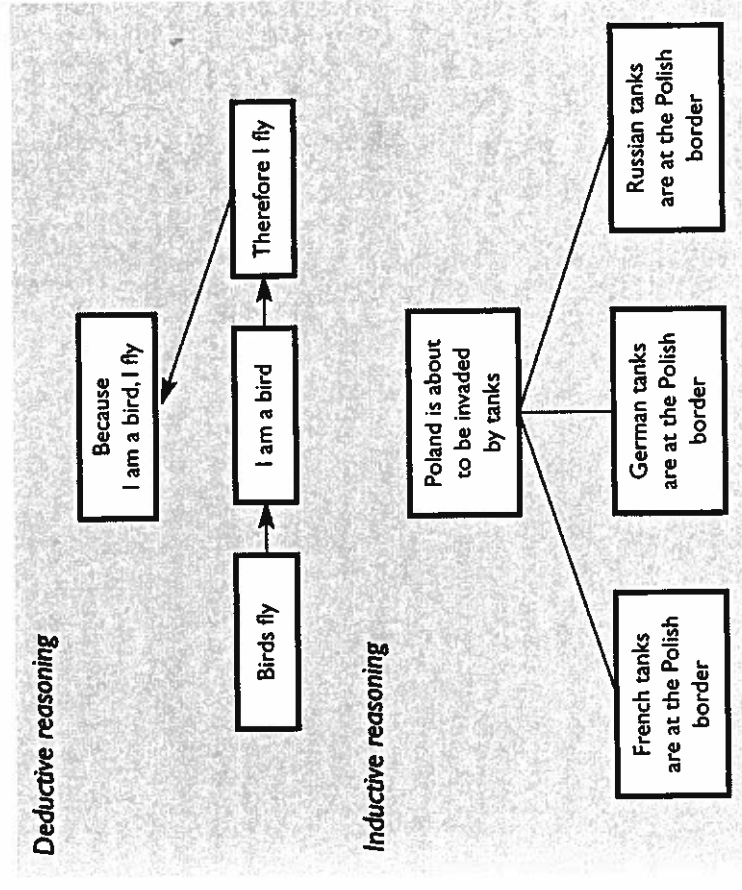
These differences are really quite enormous, as the next two sections will demonstrate. Once you have digested them, you should have little difficulty in recognizing or sorting out either form of reasoning, or in choosing the one that appropriately permits you to say clearly what you mean.

As we have demonstrated, clear writing results from a clear exposition of the exact relationships between a group of ideas on the same subject. Properly organized, these ideas will always form a pyramid, with the various levels of abstraction sorted out and related under a single thought.

Ideas in the pyramid relate in three ways – up, down, and sideways. An idea above a grouping summarizes the ideas below, while these ideas in turn explain or defend the point above. At the same time, the ideas in the grouping march sideways in logical order. What constitutes logical order differs depending on whether the pyramided group was formed deductively or inductively.

These two forms of reasoning are the only patterns available for establishing logical relationships between ideas. Consequently, an understanding of how they differ and what their rules are is essential to being able to sort out your thinking and express it clearly in writing.

Exhibit 17



DEDUCTIVE REASONING

Deductive reasoning appears to be the pattern the mind generally prefers to use in most of its thinking, possibly because it is easier to construct than inductive reasoning. In any case, it is usually the pattern one follows in problem solving, and therefore the one people attempt to follow in communicating their thinking. But while it is a useful way to think, it is a ponderous way to write, as I shall hope to show.

How It Works

First, let's understand what deductive reasoning is. It is usually described as taking the form of a syllogism – an argument in which a conclusion is inferred from two premises, one major and one minor. I find these terms confusing in explaining how deductive thinking works in writing, and so I will not use them again.

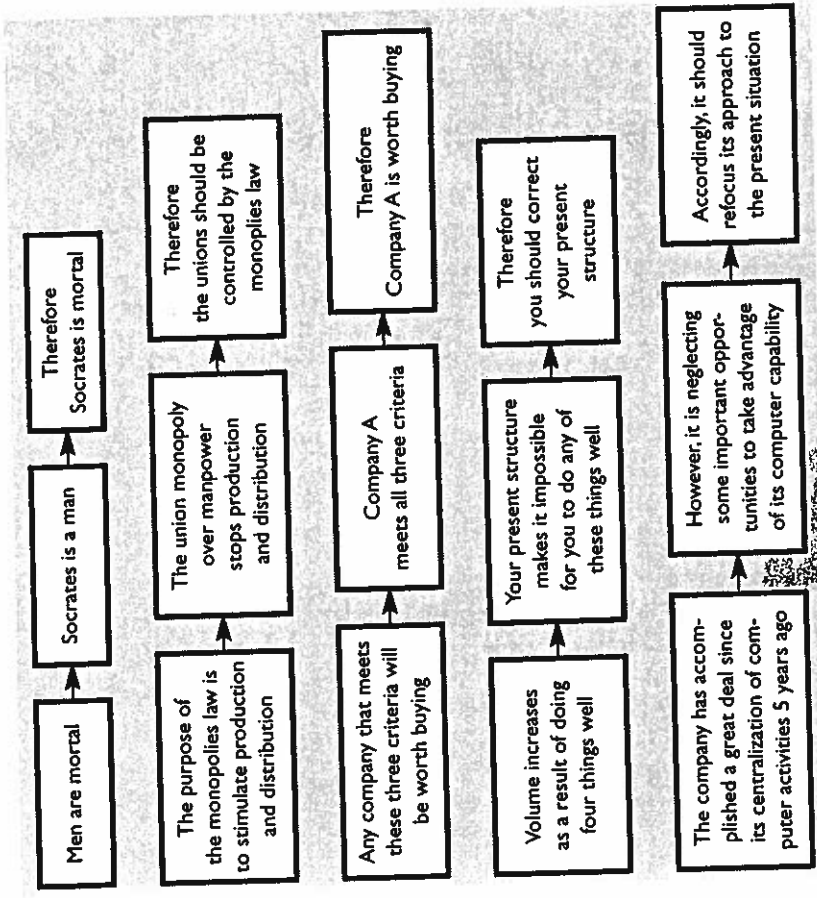
Instead, think of a deductive argument as needing to do three things:

- Make a statement about a situation that exists in the world.
- Make another statement about a related situation that exists in the world at the same time. The second statement relates to the first if it comments on either its subject or its predicate.
- State the implication of these two situations existing in the world at the same time.

Exhibit 18 shows several deductive arguments, each of which can be seen to do precisely these three things. And in each case the point at the top should roughly summarize the ideas grouped below, resting heavily on the final point. Thus, 'Because Socrates is a man he is mortal,' or 'Since the unions behave as a monopoly, they should be controlled by the monopolies law,' or 'If you want to increase your volume, you must correct your present structure,' and so forth.

These are examples of deductive arguments in which each step of the reasoning has been included. But sometimes you will find yourself wanting to skip a step and chain two or more deductive arguments together, since to put in every step would take too long and sound pedantic. This chaining of arguments is perfectly

Exhibit 18 Examples of deductive arguments



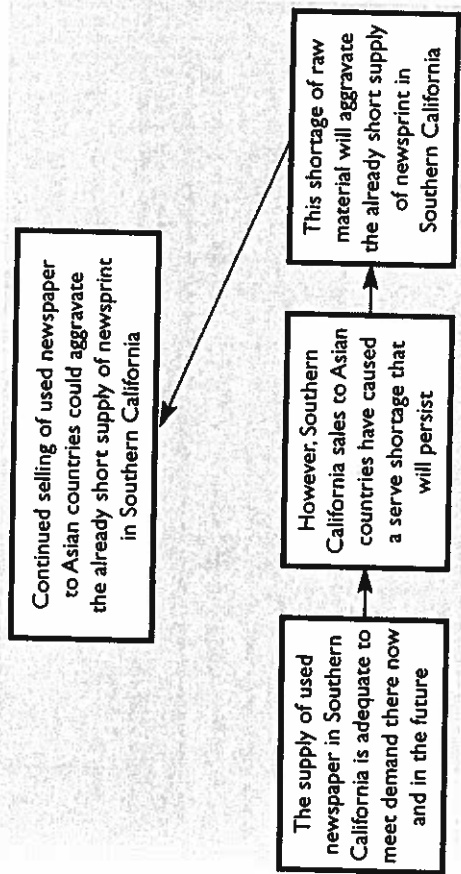
permissible, provided that your reader is likely to grasp and agree with the missing steps. Exhibit 19 gives an example of a chained deductive argument that should probably go something like this:

We produce enough used newspaper to meet our own demand.
 But we have done more than meet our own demand.
 Therefore we have a shortage.
 A shortage of used newspaper causes a shortage of newsprint.
 We have a shortage of used newspaper.
 Therefore we have a shortage of newsprint.

You can see how boring this argument would be to read if you put in every step, and in general that is my major complaint about the use

of deductive arguments in writing. They are boring, primarily because they make a mystery story out of what should be a straightforward point.

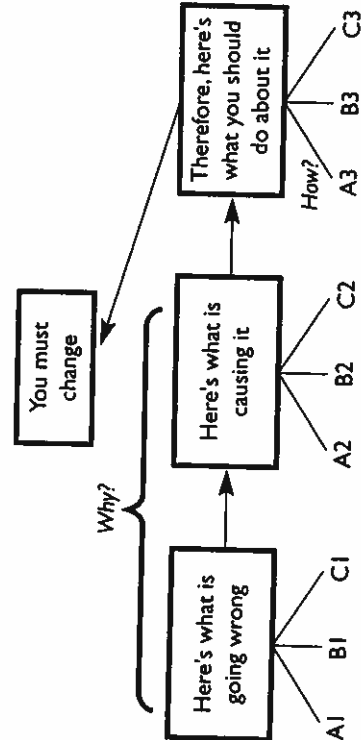
Exhibit 19 Example of a chained deductive argument



When to Use it

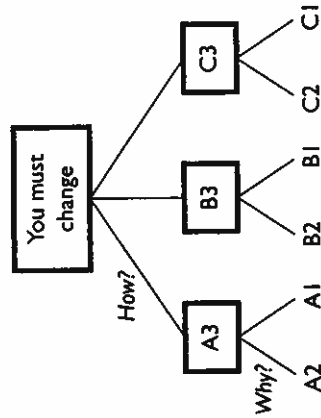
This leads me to urge that, on the Key Line level, you try to avoid using a deductive argument, and strive instead always to present your message inductively. Why? Because it is easier on the reader.

Let's look at what you force the reader to do when you ask him to absorb a deductively organized report. Suppose you wish to tell him that he must change in some way. Your argument would look something like this:



To absorb your reasoning, the reader must first take in and hold the A-B-Cs of what is going wrong. I agree this is not a difficult task, but then you ask him to take the first A of what is going wrong, bring it over and relate it to the second A of what is causing it, and then hold *that* in his head while you make the same match for the Bs and Cs. Next you ask him to repeat the process, this time tying the first A of what is going wrong to the second A of what is causing it, and hauling the whole cartload to hitch to the third A of what to do about it. And the same with the Bs and Cs.

Not only do you make the reader wait a very long time to find out what he should do Monday morning, you also force him to re-enact your entire problem-solving process before he receives his reward. It is almost as if you're saying to him, 'I worked extremely hard to get this answer, and I'm going to make sure you know it.' How much easier on everybody were you simply to present the same message inductively:



Here, instead of answering the 'Why?' question first and the 'How?' question second, you simply reverse the order. And now, while you may indeed have deductive arguments at the lower levels, still you have answered the reader's major question directly, with clear fences in your thinking between subject areas, and all information on each subject in one place.

To explain it another way, at the end of the problem-solving process, you will have come up with a set of ideas that can be sorted onto a Recommendation Worksheet like that shown in Exhibit 20. This permits you to visualize the fact that you have gathered findings that led you to draw conclusions from which you determined recommendations.

In writing to recommend action, you will never give findings that do not lead to conclusions, nor state conclusions that are not based on findings. (The conclusions are, in fact, the findings at a higher level of abstraction.) Nor will you have conclusions that do not lead to recommendations, nor recommendations that are not based on conclusions. (One conclusion can lead to several recommendations, and several conclusions can lead to one recommendation, but there must always be a connection.)

Exhibit 20

Findings	Conclusions	Recommendations
Sales are off 40%	Competitive change has cost us 40% of sales	Make similar change in our product
Competitor has added new device		
Nothing else has changed		

The conclusions generally state the problem that the recommendations solve. Consequently, the effect of the recommendation is to solve the problem you concluded was there. For example, sales are off 40 per cent (finding) because our competitor added a new device to his product (conclusion as to why sales are off), so you recommend that we add a similar device to ours. The effect of the recommendation is to make our product competitive.

Now, you can present this message deductively, one column at a time, in effect:

- Sales are off 40%
- They are off because of competitive changes
- Therefore, I recommend we make similar changes.

Or you can simply turn the whole thing 90 degrees to the left and begin with the recommendation:

We must redesign to regain position
Competition has done so

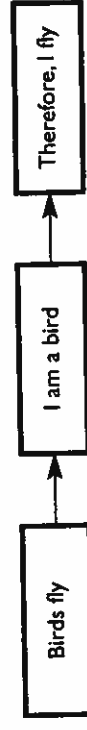
Has resulted in a 40% loss of our market share.

The issue here is whether it is better to tell the reader why he should change and then how to go about it, or that he should change and why. As a rule of thumb, it is always better to present the action before the argument, since that is what the reader cares about, unless you face one of those rare cases in which it is the argument he really cares about. I can think of only two situations in which the argument might be more important to the reader than the action:

- If he is going to disagree strongly with your conclusion, so you must prepare him to accept it
- If he is incapable of understanding the action without prior explanation (as in a paper on how to do risk analysis), so that you must give him the reasoning that underlies it.

Few of the recipients of business documents fall into either class, however, so that in general you will find yourself wanting to structure the Key Line of your pyramid to form an inductive argument.

Note that I am talking only about the Key Line here, and not about lower levels. Deductive arguments are very easy to absorb if they reach you directly:



When, however, you must plough through 10 or 12 pages between the first point and the second, and between the second and the third, then they lose their instant clarity. Consequently, you want to push deductive reasoning as low in the pyramid as possible, to limit intervening information to the minimum. At the paragraph level deductive arguments are lovely, and present an easy-to-follow flow. But inductive reasoning is always easier to absorb at higher levels.

INDUCTIVE REASONING

Inductive reasoning is much more difficult to do well than is deductive reasoning, since it is a more creative activity. In inductive reasoning the mind notices that several different things (ideas, events, facts) are similar in some way, brings them together in a group, and comments on the significance of their similarity.

In the example of the Polish tanks cited in Exhibit 17, the events were all defined as warlike movements against Poland. Hence, the inference that Poland was about to be invaded. If, however, the events had been defined as preparations by Poland's allies to attack the rest of Europe, a quite different inference would have been in order.

This brings us to the two major skills one must develop to think creatively in the inductive form:

- Defining the ideas in the grouping
- Identifying the misfits among them.

How to do both things with precision is explained in considerable detail in Chapter 7. But at this point you need only understand the rudiments of how it is done to be able to distinguish the process from deduction.

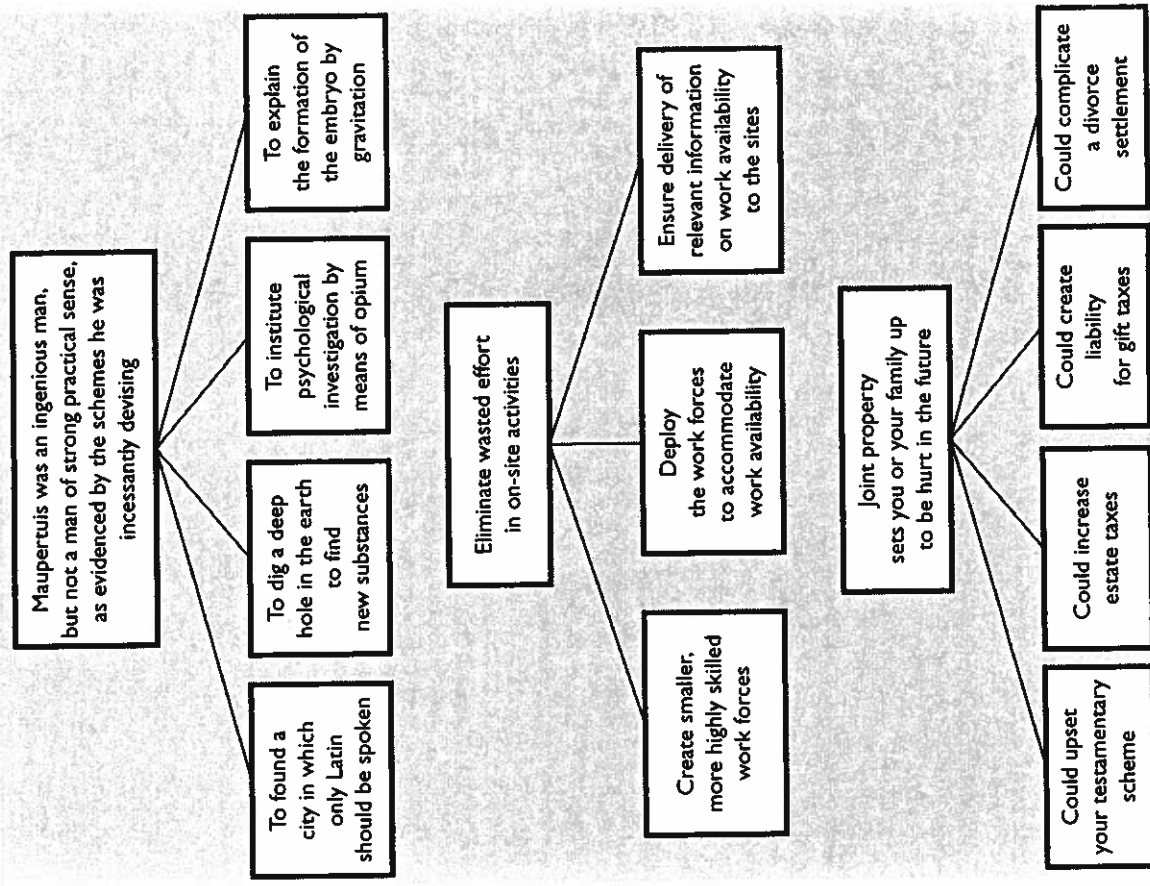
How It Works

The key technique is to find one word that describes the kind of ideas in your grouping. This word will always be a plural noun (a) because any 'kind of' thing will always be a noun, and (b) because you will always have more than one of the 'kind of' idea in your grouping. 'Warlike movements' is a plural noun in this sense, and so is 'preparations for attack.'

If you look at the inductive groupings in Exhibit 21, you will easily be able to see that each one can be described by a plural noun: schemes, steps, ways of hurting. And in each case again you can see that none of the ideas in any of the three groupings is a misfit; each one matches the description of the plural noun.

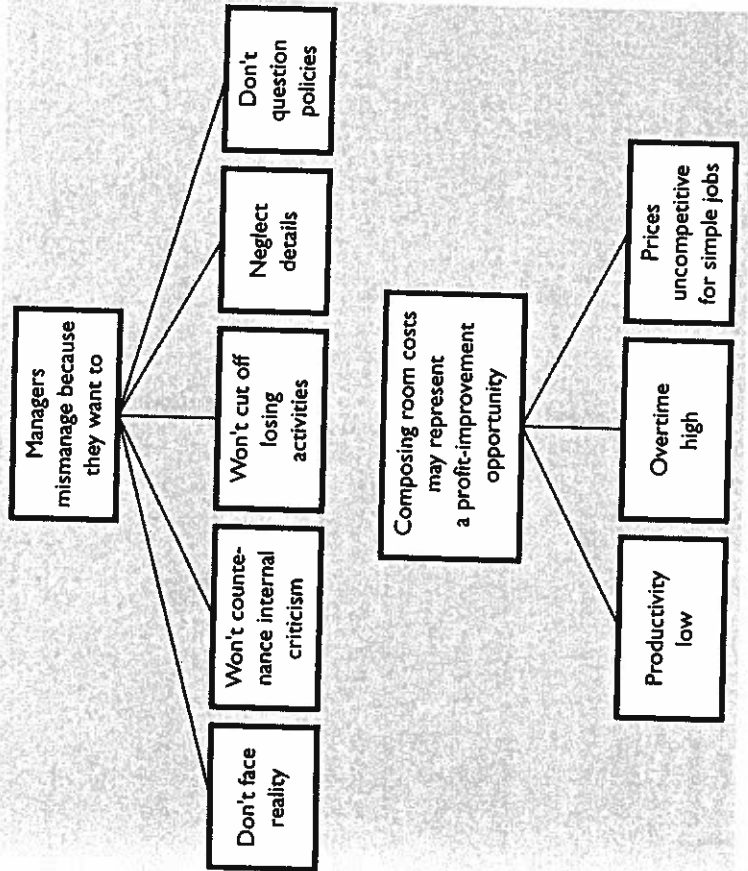
The next step is always to check your reasoning, and this is done by questioning from the bottom up. For example, if you see a man who wants to found a city in which only Latin should be spoken,

Exhibit 21 Clear inductive arguments



dig a deep hole in the center of the earth, etc., can you infer that this is an ingenious man, but not a man of strong practical sense? Yes, you can, or at least you could when the statement was originally written.

Exhibit 22 Poor inductive arguments



By contrast, consider the two examples in Exhibit 22. If you see managers who don't face reality, won't countenance criticism, etc., can you infer that they mismanage because they want to? Certainly not, it's sloppy reasoning and writing.

What about the next one? If productivity is low, overtime high, and prices uncompetitive, can you infer that you have a profit-improvement opportunity? Perhaps, but I can think of three or four other things that could also be labeled indicators of a profit-improvement opportunity. In that case, you know the overall point is at too high a level of abstraction in relationship to the three points grouped below, since it does not make a statement specifically and only about them.

In fact, however, this is really a deductive argument masquerading as an inductive one, as you may have remembered from the example in Chapter 3. The low productivity led to the high overtime, which led to uncompetitive prices. Whenever you have only one piece of

evidence for anything, you are forced to deal with it deductively. Thus, the point implied at the top is something like 'Our prices are high because our productivity is low.'

How It Differs

I'm sure you can see now how very different deduction and induction are, and how easily you can tell the difference. Remember, if you are thinking deductively, your second point will always comment on the subject or predicate of the first. If it does not so comment, you should be able to classify it by the same plural noun as the first, to test that you have a proper inductive grouping.

To demonstrate, I recently ran across two so-called deductive fallacies in a logic book, which went as follows:

All communists are proponents of socialized medicine
 Some members of the administration are proponents of socialized medicine
Therefore some members of the administration are communists.

All rabbits are very fast runners
 Some horses are very fast runners
Therefore, some horses are rabbits.

In both cases, I'm sure you will instantly be able to see that the second point does *not* make a comment on the first point, so these ideas cannot be deductively related. What the second point does do in each case is to add another member to the classification (plural noun) established in the first point. Placing ideas in classes is defining them by a plural noun, and you know that that is induction. To test yourself, suppose I say to you:

- Japanese businessmen are escalating their drive for the Chinese market.

Can you pick which of the next two points relates inductively to this, and which one deductively?

- The fact that American businessmen will soon be entering the market is sure to stimulate them further.
- American businessmen are escalating their drive for the Chinese market.

Clearly the first is deductive and the second inductive.

Note that with inductive ideas you generally either hold the subject constant and vary the predicate, or hold the predicate constant and vary the subject.

For example, you could say:

- Japanese businessmen are escalating their drive for the Chinese market
- American businessmen are escalating their drive for the Chinese market
- German businessmen are escalating their drive for the Chinese market

The smart money is moving into China.

or you could say:

- Japanese businessmen are escalating their drive for the Chinese market
- Japanese businessmen are escalating their drive for the Indian market
- Japanese businessmen are escalating their drive for the Australian market

Japanese businessmen are moving aggressively into Southeast Asia.

It is interesting to note that whether you couple the ideas to form an inductive grouping or the beginning of a deductive line of reasoning, your mind automatically expects either a summarizing statement or a 'therefore' point. This expectation of the mind for deductive and inductive arguments to be completed often leads the reader to project his thinking ahead, to formulate what he thinks your next point will be. If his is different from yours, he can become both confused and annoyed. Consequently, you want to make sure that he will easily recognize the direction in which your thinking is tending by giving him the top point before you state the ideas grouped below.

6

HOW TO HIGHLIGHT THE STRUCTURE

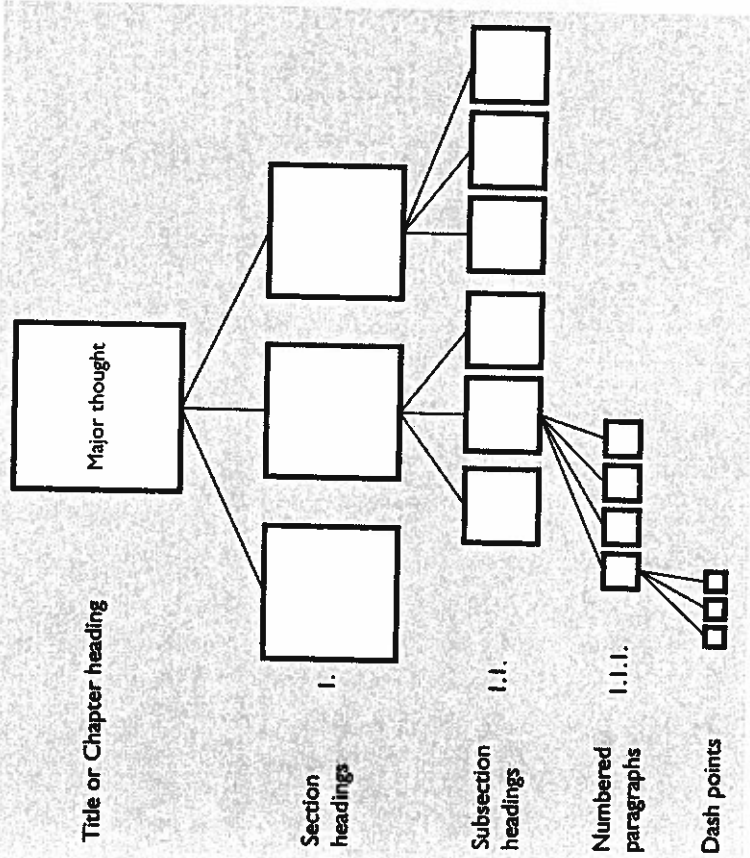
Once you have worked out the logic of your pyramid and are ready to begin writing, you want to be sure you arrange your ideas on the page in a way that emphasizes the various divisions of thought. In doing so, you will naturally reflect the hierarchical structure of the pyramid, as shown in Exhibit 23.

You can reflect this hierarchy in a variety of ways, the most common of which are headings, underlined points, decimal numbering, and indented display. Feelings run high about which of these is the 'best' formatting device. I myself lean to the use of headings as described below. However, in deference to what are excellent reasons given by proponents of the others, I discuss them as well.

Whichever format you choose, remember that your objective is to make comprehension easier for the reader. This means that the format must be applied properly to reflect the levels of abstraction in your argument. To give the desired appearance without the proper content can cause confusion.

To this end, you want to make sure you thoroughly understand the rules before you begin application.

Exhibit 23 Headings should reflect the divisions of thought



HEADINGS

Essentially, the technique is to place signs for increasingly subordinate ideas ever further to the right of the page (Exhibit 24). Thus, major ideas are capped with major section headings at the left-hand margin, divisions of these major ideas are capped with subsection headings, divisions of those with numbered paragraphs, and so on. Of course, the style of headings you choose need not necessarily follow this particular form, but whatever the form, each heading should represent a division of thought.

Because your headings will represent divisions of thought, their use should reflect the relationships between the ideas inherent in the pyramid. To this end, you will want to take care that you:

1. *Never use only one of any element.* Since the headings indicate levels of abstraction in the pyramid, you can never have only one item at each level. Thus, you can never have only one major section, or one subsection, or one numbered paragraph, or one dash point. Put more plainly, you shouldn't just stick in a heading because you think it would look good on a page, the way newspapers and magazines do, to break up the printing. A heading is meant to call attention to the fact that the idea it represents is one of a group, all of which are needed to understand the overall thought they support.

2. *Show parallel ideas in parallel form.* Since all of the ideas in a group are the same kind of idea, you want to emphasize this sameness by using the same grammatical form for the wording of each heading, etc. Consequently, if the first idea in a group of major section headings begins with a verb, all the rest must as well; if the first idea in a group of subsection headings begins with an 'ing' word, so should all the others:

Appoint a full-time Chief Executive

To coordinate activities

To effect improvements

Establish clear lines of authority

Regrouping hotels by support needs

Assigning responsibility for overseas operations

Removing Boards from the chain of command.

As you can see, because the subsection headings in the first group begin with the word 'To' does not necessarily mean that those in the second group must do so as well. Remember that there are invisible fences imposed between the ideas in each major section. Thus, the parallelism to be emphasized is between ideas in the subsection group, not between groups of subsections.

3. *Limit the wording to the essence of the thought.* The headings are meant to remind, not to dominate. Thus, you want to make them as concise as possible. You would not want, for example, to make the first major section heading above read 'Appoint a full-time Chief Executive to provide clear central authority.'

4. *Don't regard headings as part of text.* Headings are for the eye more than they are for the mind. As a result, they are not often read

Exhibit 24 Examples of Headings**1. THIS IS A CHAPTER HEADING**

Chapter headings are numbered and centered, and should be worded to reflect the major thought to be developed in the chapter. The paragraphs immediately following a chapter heading (or title) should express the major idea clearly, as well as supply whatever other information the reader requires to ensure that you and he are 'standing in the same place' before you make your point and tell him how you plan to develop it. Subsequent chapter headings should be written in parallel style.

The major divisions of thought you plan to have may be set out with paragraph points or some other distinguishing mark:

- First major thought to come
- Second major thought to come.

THIS IS A SECTION HEADING

The wording of section headings should also reflect the idea to be developed in the section to follow, and the wording of the first should parallel that of the others. A section can be further divided either into subsections or, if the points are short, into numbered paragraphs. The principal ideas of the subsections should be introduced and may be set off with paragraph points:

- First subthought to come
- Second subthought to come.

This is a

Subsection Heading

These, too, should be worded to reflect the principal thoughts they cover, and expressed in parallel style. If you wish further to divide the thought in a subsection, you can use numbered paragraphs.

1. This is a numbered paragraph. The first sentence or opening phrase can be underlined to highlight the similarity of the points being numbered. The point to be made may require more than one paragraph, but you should try to limit the development of the point to three paragraphs.

- This is a dash-point paragraph, which is used to divide the thought in a numbered paragraph
- You seldom break an idea down as far as dot-points but when you do it looks like this.

* * *

Besides these devices for dividing thoughts, you might also want to use stars (*) and paragraph points (•). Stars can be placed three in a row, in the center of the page, to indicate that a concluding comment to a long section is about to follow (see above). The paragraph point (•) can be used to set out lists when the number of items to be included is less than five (for example, for the section headings listed above), or to call attention to a single paragraph that contains a point to be emphasized.

- These paragraphs should be written in block form, and kept as short as possible.

carefully, and you cannot depend on them to carry your message. Accordingly, you need to make sure that your opening sentence under a heading indicates that you are turning to a new topic. In fact, your entire document should be able to be read as a smooth-flowing piece without the headings. By the same token, you should never use the headings as part of the text.

For example:

Appoint a full-time Chief Executive

This action will go far toward clarifying the day-to-day responsibilities of . . .

This rule, of course, does not apply to numbered paragraphs, which are meant to be read as part of the text.

5. *Introduce each group of headings.* In doing so, you want to state the major point that the grouping will explain or defend, as well as the ideas to come. To omit this service is to present the reader with a mystery story, since he will then not be able to judge what the point is you are trying to make in that section until he gets to the end – and by then he may well have forgotten the beginning. For this reason, you should never have a major section heading begin immediately after the title, nor should you ever have a subsection heading begin immediately after the section heading.

6. *Don't overdo.* This is perhaps the most important rule of all. You want to use headings only if they are going to clarify your meaning – if they are going to make it easier for the reader to keep the subdivisions of your thought in his head. Often it is not necessary or useful to have any divisions below the major section headings.

If you formulate your headings properly, they will stand in the table of contents as a precis of your report – another extremely useful device for the reader in trying to come to terms with your thinking.

UNDERLINED POINTS

Another popular approach is literally to show the hierarchy of ideas by underlining the entire statement of the

support points below the Key Line level (Exhibit 25). Lower level support points are also stated in their entirety, but distinguished by form and indentation.

The purpose of this format is to provide speed and ease in reading. The theory is that the reader should be able to speed through if he wishes, reading only the major underlined points, and in that way comprehend the entire message.

Exhibit 25

REFLECT THE MAIN POINT IN THE TITLE

Write a paragraph or so for the situation xxx xxxxx
 xxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxxxx xxxxx
 xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxx

Write a paragraph or so for the complication and the question. Sometimes the question is implied xxx xxxxx
 xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx
 xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx
 xxxxxxxxxx xxx xxxxx xxxxxxxxxx xxx xxxxx xxxxxxxxxx

State the main point. If the document is longer than seven paragraphs long, state the points on the key line:

- First Key Line point
- Second Key Line point
- Third Key Line point.

PUT A HEADING TO MATCH THE FIRST KEY LINE POINT

Write a short introduction leading up to and restating the main point. Again, if the section will be longer than seven paragraphs, state the points, centered, on the lines below, and then:

1. NUMBER THE SUPPORT POINTS, IN UPPER CASE, AND UNDERLINE, AT THE MARGIN.

(1) Indent. Number in Parentheses, the Points and Underline, in Upper and Lower Case, at the Next Level.

1. If the Document is Very Long, Number Without Parentheses, Indent, and Underline, in Upper and Lower Case, the Points at the Next Level.

- Indent with a dot the points at the next level, capitalizing only the first word.
- Indent with a dash the points at the next level, capitalizing only the first word.

While this is lovely for the reader, it can be a bit difficult for the writer, because it imposes some strict rules on him.

1. You must be absolutely disciplined in applying question/answer logic. Points below must directly answer the question raised by the point above, and no more. There is no room in this format for graceful liaisons of language or attempts at amplification. Such things destroy the clean, stark presentation of the logic. If you must amplify or give background, you will have to do so in the introductory or concluding paragraphs.
2. You must be careful to word the points so that they state their message as sparsely as possible. It destroys the ease with which the logic can be comprehended if the reader must wade through 30 words before he grasps the point. If you find yourself with more than a dozen words, or more than one subject and predicate, think again.
3. You must be totally ruthless in limiting your points to the outline of your deductive or inductive argument. Most people ignore this requirement and end up simply listing points, without regard to the niceties of either induction or deduction. You know that there are never more than four points in a chained deductive argument, and never more than five in an inductive one. If you find yourself going beyond that, the likelihood is that you have overlooked an opportunity to group, and should rethink what you are saying.

DECIMAL NUMBERING

Many companies, and most government institutions, like to use numbers rather than headings to emphasize the subdivisions of a document, and some go so far as to number every paragraph. This approach is claimed to have the advantage that any single topic or recommendation can be easily and precisely referred to.

However, frequent index numbers do tend to interrupt the reader's concentration on the content of the document, or on any section of it, as a whole. In addition, they have a distinct practical disadvantage, in that any amendment to the finished copy that eliminates a paragraph or so could necessitate the renumbering of all subsequent paragraphs. Not a pleasant thought for your secretary, even with word processing.

If you decide that you prefer to have numbering because of its value as a quick guide, you would probably be wise to use it in conjunction with, rather than as a replacement for, headings. The headings have the value of enabling the reader to pick up the gist of the ideas quickly as he reads. And they are quite useful in refreshing his memory if he finds he has to go back to the document several days after his initial reading.

In addition, you will usually find that saying 'In Section 4.1 on manufacturing profits...' is clearer as a reference in jogging someone's comprehension and thinking than is saying only 'In Section 4.1...' In the former case, the person has the general idea in mind as he turns to the specific reference; in the latter, he must get to it before he can begin to think about it.

The excerpt shown in Exhibit 26, from the opening of Chapter 5 of Antony Jay's fine book, *Effective Presentation* (or *The New Oratory*, as it is known in the United States), illustrates the way you want your document to end up looking if you use the headings/number form.

What numbering system should you use? This one is very common:

1. There is no other animal that will suffer to the death to aid its master as will a dog
 1. Other animals will run when danger nears
 - a. The dog will remain
 - i. Even though it might mean death.

This one is probably simpler to use:

1. There is no other animal that will suffer to the death to aid its master as will a dog
 - 1.1 Other animals will run when danger nears
 - 1.1.1 The dog will remain
 - 1.1.1.1 Even though it might mean death.

These examples show the relationships of the numbered levels to each other, rather than the actual form they should take. The form, as Exhibit 23 indicates, should reflect the actual divisions of thought in the piece of writing. Accordingly, you would not number the paragraphs in initial introductions, in concluding summaries, in linking comments, or in the introduction to subpoints.

Exhibit 26 Example of using headings and numbers

5. DELIVERY AND THE USE OF WORDS

Should the presenter have a written script, or just talk more or less spontaneously from a few notes? This is a constantly recurring question, and one to which more people come up with the wrong answer than any other.

To start with, let us agree that the best talker is the most natural. He is easy, fluent, friendly, amusing and free from the fetters that seem to bind others to small pieces of paper. He is just talking to us in the most natural way in the world: no script for him - how could there be? He is talking only to us and basing what he says on our reactions as he goes along. Such a talk cannot by definition be scripted.

5.1 THE PROBLEMS OF UNSCRIPTED PRESENTATION

For most of us, however, that sort of performance is an inspiration rather than a description. Our tongues are not so honeyed, and our words are less winged. And even for those who can on occasions touch those heights, there are three difficulties.

5.1.1.1. Visuals

A brilliant talker does not need visual aids to stop the audience from falling asleep, but the subject of a presentation very often demands them. And if you have them, it can be fatal to depart from the prepared order in which they are to appear. The slides and flip charts are in prearranged sequence, the operator has a fixed point at which to leave the slide machine and go outside to the film projector, and a brilliant extempore performance will mess the whole thing up.

5.1.1.2. Time

A presentation is almost always limited in time, and a certain amount has to be said in that time. Without fairly careful scripting, time is likely to be wildly overrun, or important points omitted.

5.1.1.3. The best way

If you accept that certain points have to be made in a certain time to a certain audience, the logic of optimization takes over. There is a best order in which to make the points. There is a best way of putting them to make them clear to the audience. There are best words and phrases to emphasize your arguments. Quite soon you discover that any genuinely spontaneous performance is not practicable, so it might as well all be scripted.

Most people get to this stage, and this is where it all goes wrong. They sit down at their desk, write out what they want to say, hand it to their secretary, and tell themselves that they have written their presentation. But they haven't. They have written a paper.

5.2 DON'T READ THEM A PAPER

I am not sure why it should be slightly offensive and insulting to have a document read to you, or obviously memorized and recited at you, in this sort of situation. Eminent professors read papers to learned societies, and no one complains: but in that case the audience are usually receiving (or hope they are receiving) a privileged preview of a new contribution to knowledge which will later be published...

INDENTED DISPLAY

Sometimes your document will be so short that neither headings nor decimal numbering would be appropriate to highlight the divisions of your thinking. Nevertheless, you will still be dealing with groupings of ideas, and you will want to highlight them in some way.

Groups of points supporting or explaining an overall idea are always easier for the reader to absorb if they are set off so as to be easily distinguishable as a group. Consider, for example, the two versions of the memorandum shown in Exhibit 27.

Exhibit 27-A

I have scheduled a Creative Thinking session with Frank Griffith and the industrial engineers for the second week of September, and for Al Beam and his staff for the third week of September.

I think we need just a few slides to supplement the introduction, which is attached with suggested slide concepts.

We also need slides of the Specific Examples of Positive Reinforcement language. These slides would be used as a wrap-up at the end of the presentation. This language should also be in printed form to be used as a handout.

Slides showing the results of innovation we have had, such as the slides that you made of the musical instruments, would be quite valuable for the Frank Griffith meeting for the second week, and they would be essential for the Al Beam meeting set for the third week of September.

We have purchased the film 'Why Man Creates' to be used as part of the introduction of the program.

Slides are also needed for the section on Innovation Environment Chart Traits.

The first version is perfectly clear as it stands; but the approach used in the second version makes the points literally 'jump out' at the reader.

Exhibit 27-B

I have scheduled a Creative Thinking session with Frank Griffith and the industrial engineers for the second week of September, and for Al Beam and his staff for the third week of September. For both these meetings I will need slides showing:

1. The major points made in the introduction. Suggested concepts are attached.
2. Specific examples of positive reinforcement language. These slides would be used as a wrap-up at the end of the presentation. This language should also be in printed form to be used as a handout.
3. The results of innovation we have had, such as the slides that you made of the musical instruments. These would be quite valuable for the Frank Griffith meeting, but essential for the Al Beam meeting.
4. The steps needed to create an environment for innovation.

In general, the major rule to remember when you set your ideas off in this way is that you want to be sure to express them in the same grammatical form. Not only does this usually save words and make the ideas easier to grasp, but it also helps you to check whether you are saying clearly what you mean to say. Arranging the ideas in this way in Exhibit 27-B, for instance, shows up the fact that the author has not stated what kind of slides he wants for the section on Innovation Environment.

Whether the memorandum is long or short, the visual arrangement of groups of ideas to set off their similarity to each other as ideas will always make them easier to comprehend. As with headings, however, one set of indented groupings per memorandum is enough; otherwise the visual effect is lessened.

All of these devices serve as visual aids to the reader. They are meant to display to the reader's eye the logical relationships with which his

mind is grappling, and in this way to help him comprehend them more quickly. Admittedly, they save only tiny amounts of the reader's time, but if he is a person who has scores of documents passing over his desk each day, the value of such small savings is considerable.



2
PART

THE PYRAMID PRINCIPLE

LOGIC IN THINKING



INTRODUCTION

TO PART 2

As you try to apply The Pyramid Principle to a specific writing task, you should on most occasions, with a bit of practice, have little difficulty in creating an overall structure for your thinking. You can generally identify your Subject without much effort, determine the reader's Question, think through the Situation and the Complication, and proceed with a listing of your major points. With your title and major side headings decided, you can then settle to the serious business of putting it all into writing.

But no matter how carefully you have done your thinking in coming up with this initial structure, you are unlikely to produce a first draft that is perfectly logical and obeys all the rules. Points that seem to group logically in pyramid form often prove to have only a tenuous connection when clothed in prose. And watertight arguments have been known to spring gaping holes when you try to marshal valid support.

Unfortunately, you are unlikely to be able to see these flaws without making a special effort to do so. Once you put ideas in writing, they take on an incredible beauty in the author's eyes. They seem to glow with a fine patina that you will be quite reluctant to disturb.

The most efficient way to overcome this psychological impediment is to have a checklist of rules you apply to every grouping in the structure, so that you are forced to look at it critically. In this way your parental pride is backed into abeyance, and you can be objective about what you see. (This approach applies equally effectively, of course, to reading someone else's draft.)

There are essentially four sets of such rules available to help you focus your critical faculties:

1. You can question the general *order* of the ideas in a grouping.
2. You can question their particular *source* in your problem-solving process.

3. You can question your *summary statement* about them.
4. You can question the *prose* in which you express them.

The following chapters explain the theory and practice behind each of these techniques. In reading this material, it may strike you that some parts are both more technical and more abstract than you are used to from the earlier chapters. Alas, there seems to be no other way to explain the concepts clearly than to outline the theory behind them first. However, proper application of the concepts is so essential to clear writing that I'm sure you will find the extra effort required to understand the theory well worthwhile.

7

QUESTIONING THE ORDER OF A GROUPING

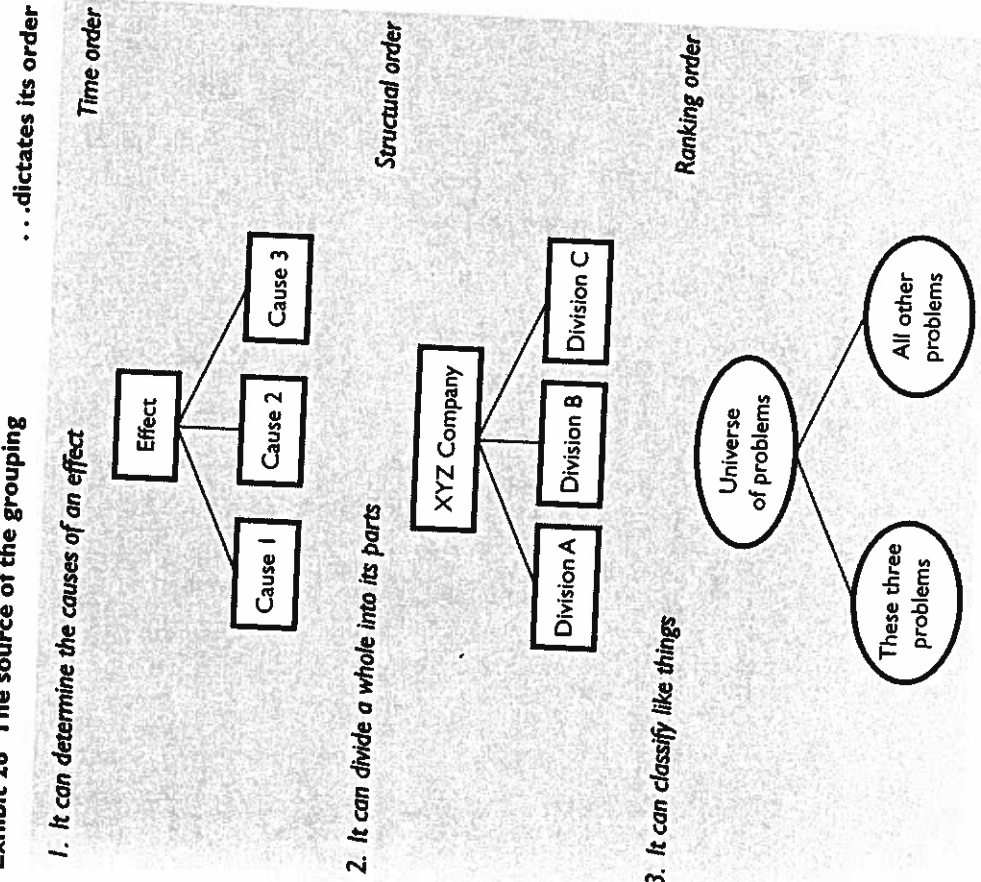
You know that ideas in any grouping must be placed in logical order. In deductive groupings, of course, that is no problem, since logical order is the order imposed by the structure of the argument. In inductive groupings, however, you have a choice of how to order. Thus, you need to know how to make the choice, and how to judge that you have made the right choice.

To this end you must understand that ideas grouped together in writing are never brought there by chance. They are always picked out of your mind because it sees them as having a logical relationship. For example:

- Three steps to solve a problem
- Three key factors for success in an industry
- Three problems in a company.

To see such relationships, the mind must have performed a logical analysis. In that case, the order you choose should reflect the analytical activity that your mind performed to create the grouping. The mind can perform only three analytical activities of this nature (Exhibit 28).

Exhibit 28 The source of the grouping



1. *It can determine the causes of an effect.* Whenever you make statements in writing that tell the reader to do something – fire the sales manager, say, or delegate profit responsibility to the regions – you do so because you believe the action will have a particular effect. You have determined in advance the effect you

want to achieve, and then identified the action necessary to achieve it.

When several actions are together required to achieve the effect (e.g., three steps to solve a problem), they become a process or a system—the set of causes that in concert create the effect. The steps required to complete the process or implement the system can only be carried out one at a time, over time. Thus, a grouping of steps that represents a process or system always goes in *time order*.

2. *It can divide a whole into its parts.* You are familiar with this technique in creating organization charts or picturing the structure of an industry. If you are going to determine the ‘key factors for success in an industry,’ for example, you must first visualize the structure of that industry. Having done so, you determine what must be done well to succeed in each part of it. The resulting grouping of three or four key factors would then logically be ordered to match the order of the parts shown in the structure you visualized. This is *structural order*.

3. *It can classify like things together.* Whenever you say that a company ‘has three problems,’ you are not speaking literal truth. The company has many problems – some total universe of problems – of which you have classified three as being noteworthy in some way compared to the others. You are saying that each possesses a characteristic by which you are able to identify it as a particular kind of problem – say because each one is the result of a refusal to delegate authority.

All three problems are the same in that each possesses this characteristic, but they are all different in that each possesses it to a different degree. (If they possessed it to the same degree, you could not distinguish between them on this basis.) Because they are different, therefore, you rank them in the order in which they possess to the greatest degree whatever characteristic made you identify them as problems in the first place. This is called *ranking order*.

These orders can be applied singly or in combination, but one of them must always be present in a grouping. Let me tell you more about each of them and how you can use them to check your thinking.

TIME ORDER

Time order is the simplest order of all to understand, and the most pervasive in business writing. What you are doing in a time-ordered grouping is spelling out the steps a person must take to achieve a particular effect, in the order in which he must take them.

Although it seems a simple discipline to impose, it is extraordinary how frequently people fail to impose it. Consequently, the most common logical flaw you are likely to find in a first draft is improper time groupings. The trick in sorting them out is to visualize yourself taking the actions in each case.

Ask yourself, 'What would I do first if I were doing this? What second? etc.' Answering the question can help you to uncover instances where your thinking has been incomplete, your logic confused, or your grouping false.

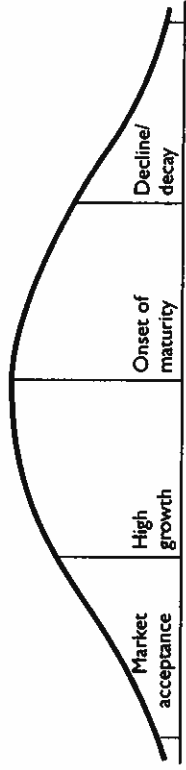
Incomplete Thinking

Try the questioning of the order on this example:

Strategic planning involves the recognition of a timing cycle.
 Perception of need
 Development of strategy for creating responsive product/service
 Implementation
 Market acceptance and high growth
 Slower growth, the onset of maturity
 High cash generation
 Decline/decay.

Were you reviewing this for sense, you would be looking to see that they are indeed all the steps in the cycle and that they are in the right order. Put yourself in the doer's place. First you would perceive the need, then you would develop a strategy, then implement the strategy, then... Oops, here is a problem.

What the author appears to have done is to group three actions the company takes and four things that result. If you look at the results for a moment, you can see that he is reflecting the normal product life-cycle curve in which you get:



Thus, he must mean his fourth step to be something like 'Track the market's reaction,' with these points as the path of that reaction. We do have one point left over: high cash generation. This, however, is normally a characteristic of the onset-of-maturity phase, so does not belong in the list at all.

Confused Logic

That was a relatively simple example of incomplete thinking. But the technique is equally useful when the logic is badly confused, as in this example:

However, business definition...
 Relies heavily on creative processes
 Demand segmentation
 Supply segmentation
 Changes over time
 Early vs. late stages of life cycle
 Competitive dynamics
 Not necessarily unique in a given industry
 Influenced by marketer's own strength vs. competition.

Whatever can he mean? Is it time order that he is talking about in carrying out the act of business definition: first you be creative, then you change, then... No, that doesn't make sense. What are the actions implied here? Segmentation, review for changes, assessment of competitive strengths. Now can you see an order?

Business definition requires careful analysis:

In defining market segments

In assessing your competitive position in each segment

In tracking changes in position over time.

False Grouping

You can see the power of the technique in identifying improper order because of confused logic. It also lets you identify when you have brought ideas together that don't belong in the grouping, as here:

The traditional focus of investment evaluation is to compare future returns and probable costs

It is often technically unsound.

It rests on simplistic concepts.

It results in misleading prescriptions.

Are these ideas in order of importance? In time order? In structural order? Or in none of the above? If you look critically you can see that the third idea is the effect of the other two. Thus, he seems to be saying:

Evaluating investments by comparing future returns to probable costs results in misleading prescriptions.

The concept itself is simplistic.

Its application is often technically unsound.

The order is time order, in the sense that you have to have the concept before you can apply it badly. But do you need more than a bad concept and bad application of it for misleading prescriptions to result? Is the first one alone enough? I don't know the answer. What I am trying to demonstrate here is that once you impose a logical order on the ideas, you are then in a position to check that the thinking is complete. You cannot do so while the concept itself is unclear.

Sometimes you will find that time order is imposed on an existing structure, so that the structure dictates the number and sequence of steps. To that end let's look at structural order.

STRUCTURAL ORDER

First, what exactly is structural order? It is the order that reflects what you see once you have visualized something – either by diagram or map, by drawing or photograph. The 'something' you visualize can be real or conceptual, an object or a

process. It must, however, have been properly divided to show its parts.

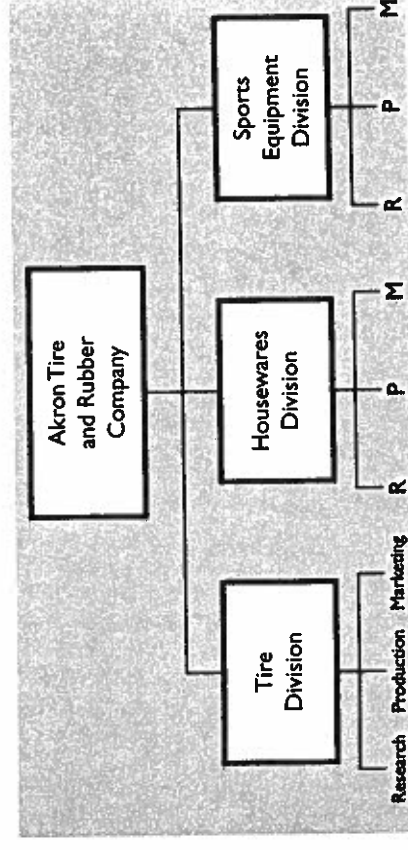
Creating a Structure

When you divide a whole into its parts – whether it be a physical whole or a conceptual one – you must make sure that the pieces you produce are:

- *Mutually exclusive* of each other
- *Collectively exhaustive* in terms of the whole.

I abbreviate this mouthful to MECE, but it is a concept you no doubt apply automatically every time you create an organization chart (Exhibit 29).

Exhibit 29 A typical organization chart



Mutually exclusive means that what goes on in the Tire Division is not duplicated in Housewares, and what goes on in Sports Equipment is distinct from both. In other words, no overlaps. Collectively exhaustive means that what goes on in all three divisions is everything that goes on in the Akron Tire and Rubber Company. In other words, nothing left out.

If you apply these rules when you divide, you can be sure that the structure you create shows all the pieces that must be described if you are to explain it to someone else. Structural order at its simplest,

then, means that you will describe the pieces of the structure as they appear on the diagram.

But how do you know what order to put them in on the diagram? This question most frequently arises when people draw organization charts. The order you put the boxes in on an organization chart will reflect the principle of division you employed to create them.

There are basically three ways to divide the activities of an organization – by the activities themselves (e.g., research, marketing, production), by the location in which the activities take place (e.g., Eastern Region, Midwest, West), or by sets of activities directed to a particular product, market, or customer (e.g., Tires, Housewares, Sports Equipment).

- If you divide to emphasize the activities, they reflect a process, and thus go in time order.
- If you divide to emphasize location, they go in structural order, reflecting the realities of geography.
- If you divide to emphasize activities relating to a single product/market, you have classified, and thus the ideas go in ranking order, by whatever measure you decide is relevant for ranking (e.g., sales, investment).

Thus, suppose you had created this set of departments in reorganizing a city government:

1. Housing
2. Transportation
3. Education
4. Recreation
5. Personal Health
6. Environmental Health

These are the activities for which you think the city is responsible, and the order in which you put them reflects the order in which the city government would have to be concerned about its populace if it were starting the city from scratch. Forcing yourself to see an order, particularly if you are creating something new like an organization, permits you to check that you have been collectively exhaustive for your purposes.

In dividing things other than organizations, however, your purpose is generally to analyze how those things function. You are

therefore dividing by functioning part, and you show the parts in the order in which they would be expected to perform that function. Thus, if you were discussing a radar set, you would order its parts to reflect the order of their functioning:

1. Modulator
2. Radio-frequency oscillator
3. Antenna with suitable scanning mechanism
4. Receiver
5. Indicator.

The modulator takes in power that the oscillator then gives out. The antenna concentrates that power into a beam, the receiver takes in signals passed back from the beam's scanner, and the indicator in turn presents the data.

Describing a Structure

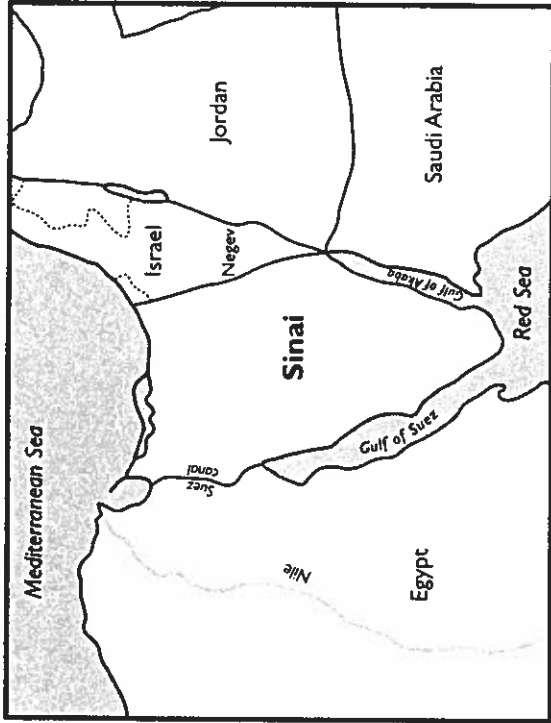
Once the structure is set up, one way to describe it is to follow it from the top down and from left to right, describing each part in the order in which it appears. This is the form you would follow if you were giving a technical description of the radar set described above, or any other technical description of a piece of machinery.

However, you can also impose a process order on your description. To illustrate, on page 106 is a map of the Sinai Desert. The passage following describes its structure.

The 'contexts' in which one can view the map are listed in the order in which the eye would comprehend them as it began to look at the map. First, it would fasten on the wedge, because it's so obvious. Then it would see the split from Egypt, then the southern part of Israel, then the top of Saudi Arabia. Finally, it would travel back from east to west. Thus, the author has visualized the process a reader would follow in examining the map, and reflected that order in his description.

Visualizing a process in relationship to a structure is a common device, particularly if you are writing to recommend changes to an existing structure. Suppose, for example, you had the structure of a city government shown at the top of Exhibit 31, and you were recommending replacing it with that shown at the bottom.

Exhibit 30 Map of the Sinai Desert
 (From *The New Yorker*, June 4, 1979, 'Sinai: The Great and Terrible Wilderness' by Burton Bernstein.)

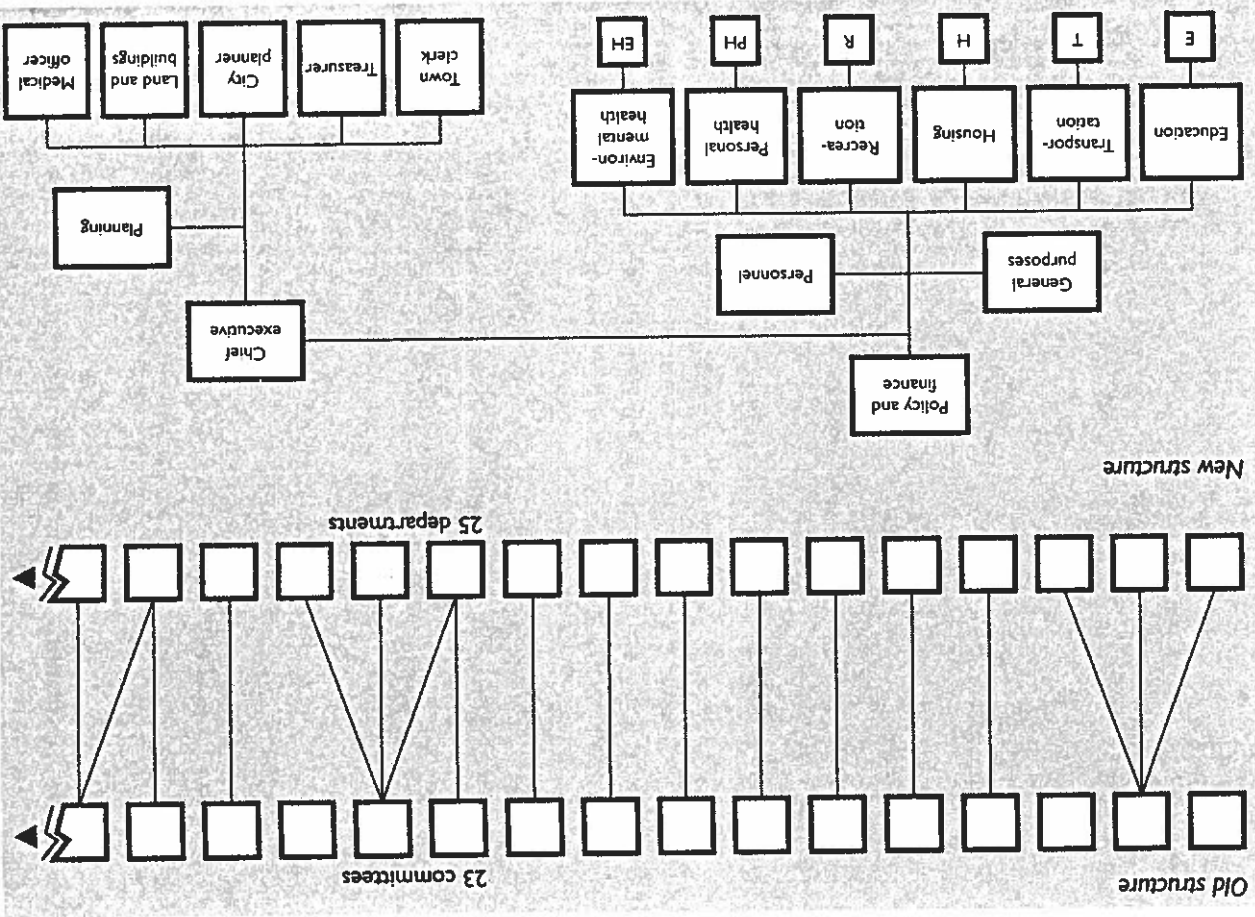


On any map of the Middle East, the Sinai Peninsula sits dead center, an almost perfect inverted isosceles triangle, a sharp wedge that seems to cleave Africa from Arab Asia. Depending on one's political persuasion, it can be seen in several other contexts: as an eastern arm of Egypt, holy Egyptian soil, severed from its motherland only a little more than a century ago by the Suez Canal; as a natural and logical southern extension of Israel, a massive broadening of the Negev Desert; as a northern adjunct of Saudi Arabia, separated from that immensity by the narrow Gulf of Akaba; or, simply, as an ancient land bridge connecting East and West, a handy route for caravans and invading armies.

You would be recommending four changes to get from the first structure to the second. In what order should you state them? They are all equally important, so you cannot put them in order of importance. They must, in theory, all be done at the same time, so that kind of time order is not appropriate.

The order that makes most sense in a case like this is the order in which you would draw the elements on a blank sheet of paper if you were presenting them to the reader one at a time. Thus, my first step would be to group the many departments into the six shown. The second step would be to put the Policy and Finance Committee in charge of the whole. The third step would be to create the two groups to support the Committee, and the final one would be to create the administrative team needed to manage the paperwork.

Exhibit 31 Structures of a City Government



Imposing a Structure

You can also use the concept of structural order to help you sort out faulty logic in a grouping. Suppose you had this set of steps presented to you for your approval:

The objectives for the assignment, as we understand them, are:

1. To review and analyze field operations in maintenance and construction areas
2. To determine if adequate organizational and managerial flexibility exists to allow field engineers to properly respond to day-to-day operating problems and demands from the public
3. To review and analyze the areas of preliminary engineering, road and bridge design, environmental process, right-of-way acquisition and traffic management
4. To review and analyze the organization structure of the Department
5. To identify the strengths and weaknesses within each study area.

Why this order? Where did these ideas come from? First of all, you can see that point 5 does not go with the others because it refers to them all, so we can eliminate that. Then let's see what subjects he's talking about in the others:

1. Maintenance
Construction
2. Day-to-day operations
3. Preliminary engineering
Road and bridge design
4. Organization structure.
5. Environmental process
Right-of-way acquisition
Traffic management

If we attempt to see them in terms of a process concerned with roadbuilding, etc., you would assume the steps involved would be these:

1. Design
2. Construct
3. Operate
4. Maintain.

In that case, perhaps the author meant to say that the objective for the assignment would be to determine whether the Department is

properly organized and managed to carry out its activities, of which there are four.

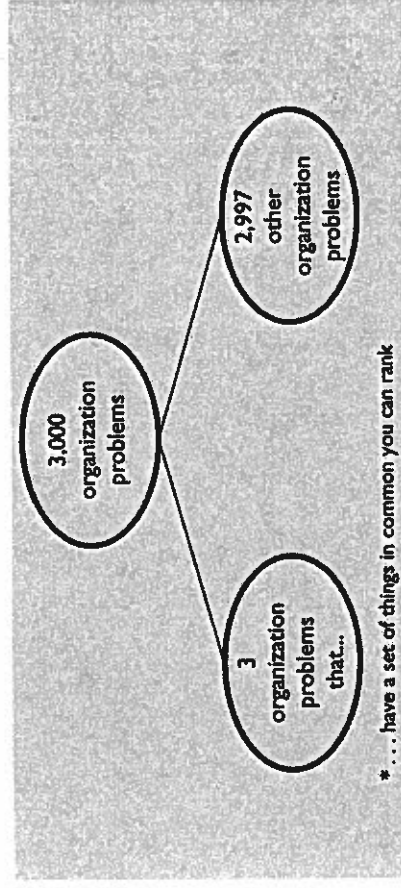
RANKING ORDER

Finally, we come to ranking order, or order of importance. This is the order you impose on a grouping when it brings together a set of things you have classified as being alike because they possess a characteristic in common – e.g., three problems, four reasons, five variables.

Creating Proper Class Groupings

In classifying, when you say, 'The company has three problems,' your mind automatically separates these three problems from all other possible problems the company has or could have, creating a bifurcate structure like that shown in Exhibit 32. The two classes formed are by definition collectively exhaustive, and are of course meant to be mutually exclusive.

Exhibit 32 Classification limits your thinking to a narrow universe



You prove they are mutually exclusive by defining quite specifically what characteristic they have in common, and then searching your knowledge to make sure you have included in your grouping all known items with this same characteristic. Then you place them in

the order of the degree to which each possesses the characteristic by which you classified it – presenting the strongest one first.

(Many people ask me whether, having determined the relative weight of the points, you always have to put the strongest one first. They point out that it would be more dramatic to put the weakest one first and work up to the strongest one. It would indeed be more dramatic, but would it be clearer? I think not, and so I prefer strongest-to-weakest. However, this is a question of style, predicated on appeal to emotions, and in some cases you may quite legitimately decide to reverse the order for greater emotional impact.)

Were the process described above all there is to classifying ideas, there would be very little to say about problems in ordering them. However, classifying is a ubiquitous human habit. People classify everything they see as soon as they see it, simply by naming what it is. Unfortunately, when they come to ideas they do not limit themselves only to creating classes of points that are alike by virtue of their possessing a *characteristic* in common. They also consider ideas to be alike, and therefore classifiable, if they were derived from the same process or drawn from the same *structure*.

This is a perfectly legitimate thing to do in writing, provided that you are clear about the source of your grouping and reflect accordingly the order it imposes. But more often than not, the great pleasure authors feel in having thought up three or four points to include in a grouping prevents them from questioning the logic of its origin.

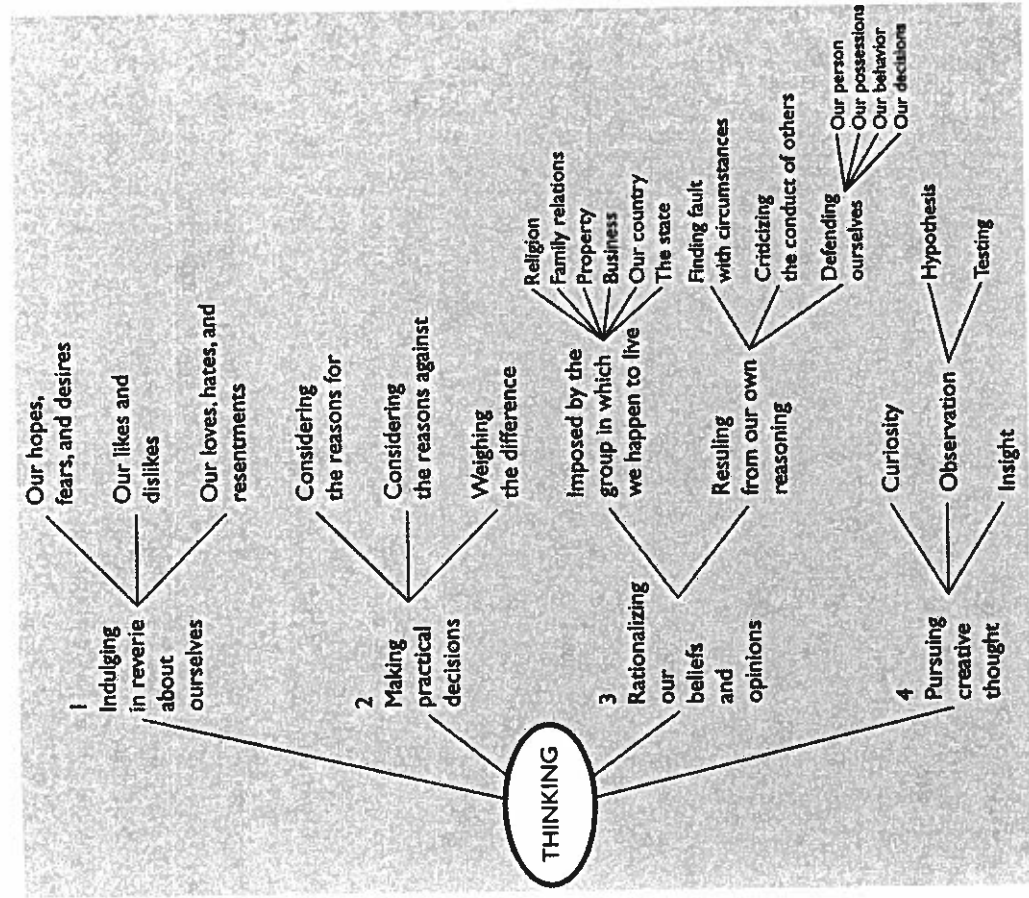
Let me give you an example of perfectly acceptable, but indiscriminate classifying, and then show you how to use this knowledge to discover flaws in what seem like proper class groupings.

Several years ago Bankers Trust Company reprinted a 1921 piece by James Harvey Robinson called *The Mind in the Making*. In it Robinson said:

'We do not think enough about thinking, and much of our confusion is the result of current illusions in regard to it. Let us forget for the moment any impressions we may have derived from the philosophers, and see what seems to happen in ourselves.'

He then proceeded to classify the various kinds of thinking as shown in Exhibit 33. You see there four class groupings. Only the first and third of these appear to reflect the act of grouping by common characteristic. The second and fourth present a process, answering the question 'How?' Looking at the first grouping for a moment, the technique I use to determine its validity is to question its origin:

Exhibit 33 The Classes of Thinking



1. What does he label the points as?
Things that determine the course of the reverie
2. Can I find anything more specifically the same about them?
They are all emotional reactions we have to the world.
3. Can I justify their order on that basis?
Most commonly felt reaction first.
4. Are there any missing?
Probably not.

You may, of course, disagree with this assessment, and you may be right. The point is that to check the thinking for completeness, you must be able to identify its source and make sure you have included all that the source produces. In this case I can't think of any other emotional reactions that people have to the world around them, but you may be able to do so. If you can, then you have enlarged on his thinking; if you can't, then you must concede that his reasoning makes sense.

Looking in the same way at the third grouping (Rationalizing our beliefs and opinions), the first breakdown shows the MECE ways in which we acquire beliefs and opinions. Moving down a level on the first one:

1. What does he label the points as?
Cherished convictions about which we feel certain.
2. Can I find anything more specifically the same about them?
They all reflect the influence of early teaching.
3. Can I justify their order on that basis?
Order in which the teaching would be absorbed? I don't think so.
4. Are there any missing?
Rather it would seem there are too many, specifically the beliefs about property and business.

What difference does it make, you may ask, whether the grouping is overcomplete or incomplete? It will affect the way in which the inference you draw from the groupings is accepted as true by the reader. If overcomplete, your statement will not apply equally to the points below. If incomplete, someone else adding members to it could draw a different inference.

In this case, for example, the author's summary statement was:

- We like to continue to believe what we have been accustomed to accept as true, and the resentment aroused when doubt is cast upon any of our assumptions leads us to seek every manner of excuse for clinging to them.

That may be true of religion, the family, our country, and the state. I find it difficult, however, to envision people jumping to defend the concept of property or ideas about business with quite the same emotional intensity.

By contrast, the summary to the first grouping said this:

- A great part of our spontaneous thinking is far too intimate, personal, ignoble, or trivial to permit us to reveal more than a small part of it.

It appears to apply equally to all three points and we cannot think of others to add to the grouping.

To repeat, my purpose here is to show you that groupings are not just drawn out of the air, but reflect an analytical assessment that implies a strict order. You want deliberately to look for this order in every class grouping so that you can be certain you are saying what you mean.

Identifying Improper Class Groupings

To show you the difference it can make to your thinking, let's look at some examples. Suppose you came across this:

The traditional financial focus of investment evaluation results in misleading prescriptions for corporate behavior. . .

Corporations should invest in all opportunities where probable returns exceed the cost of capital

Better quantification of future uncertainty and risk is the key to more effective resource allocation

Planning and capital budgeting are two separate processes

Capital budgeting is a financial activity

Top management's role is to challenge the numbers rather than the underlying thinking.

Now apparently these are the four misleading prescriptions that result from the traditional financial focus. More specifically, they are commonly believed 'rules of thumb' in corporations. But are they? If you reword them as results, they say, to abbreviate them:

Encourages corporations to invest
Emphasizes quantification of uncertainty
Separates planning and capital budgeting
Leads top management to focus on the numbers.

All but the third can now be seen as part of a process of decision making, which would dictate a different order, which in turn would lead to a clearer point at the top:

The traditional financial focus of investment evaluation can result in poor resource allocation decisions:
Emphasizes quantification of future uncertainty and risk as the key to choosing among projects
Leads top management to focus on the numbers rather than the underlying thinking
Encourages investment in all opportunities where probable returns exceed the cost of capital, ignoring other considerations.

That one was easy to sort out because the kind of idea you were dealing with was easy to identify simply by reading it. Very often, however, you will find yourself with several kinds of ideas whose class membership is not that easy to see at first reading.

Problems with sales and inventory systems reports:
1. Report frequency is inappropriate
2. Inventory data are unreliable
3. Inventory data are too late
4. Inventory data cannot be matched to sales data
5. People want reports with better formats
6. People want elimination of meaningless data
7. People want exception highlighting
8. People want to do fewer calculations manually.

The trick is to go through and sort them into rough categories, as a prelude to looking more critically later. You get the categories by defining the *kind of problem* they are discussing:

Timing
1. Report frequency is inappropriate
3. Inventory data are too late
Data
2. Inventory data are unreliable
4. Inventory data cannot be matched to sales data
6. People want elimination of meaningless data
Format
5. People want better report formats
7. People want exception highlighting
8. People want to do fewer calculations manually.

You have a double ordering task here. First, in what order do you put timing, data, and format? That depends on the process you think they reflect. Here we have two possibilities: we could be talking about the process of preparing the reports, or we could be talking about the process of reading the reports.

If you are talking about preparing the reports, you would complain first about the data, then about the format, then about the timing, because that is the order in which the preparer would deal with them. On the other hand, if you are talking about reading the reports, you would complain first about the timing, then about the format, then about the data, for the same reason.

How about ordering the ideas in each grouping? Under Timing, points 1 and 3 should probably be reversed, as you worry about lateness before you worry about frequency. Under Data, I should think you would complain first that a good deal of the data are meaningless, what is not meaningless is unreliable, and what is reliable can't be matched. Process order again. Under Format, points 7 and 8 would be subsets of point 5, with the 'fewer calculations' probably coming before the 'highlighting.'

A great value of the exercise has been to show that in some areas the thinking is incomplete, so that the author can review his analysis. Here's another example:

The causes of New York's decline are many and complex. Among them are:

1. Wage rates higher than those that prevail elsewhere in the country
2. High energy, rent and land costs
3. Traffic congestion that forces up transportation costs
4. A lack of modern factory space
5. High taxes
6. Technological change
7. The competition of new centers of economic concentration in the Southwest and the West
8. The refocusing of American economic and social life in the suburbs.

This is a good example of 'truism' in argument. What in effect the author is saying is:

- Everybody knows that there are lots of reasons for New York's decline
- Here are some of them
- Therefore... (?) on to the next subject.

The problem with such 'for instancing' is that it cannot lead you logically to consider what you do about the problems. As a partial list it communicates nothing, because you cannot draw a clear inference from it.

Nevertheless, 8 points hardly seems partial. Is there any message at all? Where can you see some similarities?

Costs

1. High wage rates
2. High energy, rent, land
3. High transportation
5. High taxes

Unsuitability of area

4. Lack of modern factory space to modernize into
6. Technological change (leading to need to modernize)
8. Business associates moved to suburbs

Alternative choice

7. New centers in the Southwest and West

Perhaps he means to be saying this:

The causes of New York's decline reflect in part the growth of new business centers

It has always been a high-cost city in which to do business

More attractive areas are springing up in the Southwest and West

Thus, when companies face the need to move, they choose to move south.

This may not be at all what the author meant to say, but it is what an interested reader might glean from his listing. By pointing out what it does seem to be saying, you give the author the opportunity to rewrite it, to say more clearly what he does mean.

I want to give you just one more example. It is a very difficult one, in that it is almost a free association of points. However, given our technique it is relatively easy to work out. And it does demonstrate that the author had a structure in his head before he began to write. He simply reflected his comprehension of it badly.

It is written by someone in a soft-drinks manufacturing company that had decided to put its product into plastic rather than glass bottles. It could buy the plastic bottles on the outside, or it could create its own plastic bottle manufacturing capability.

There are a number of internal/external risks and constraints that preclude an investment in any plastic bottle venture:

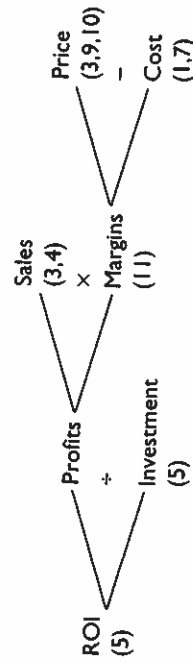
1. Technical risk—undeveloped design problems
2. Environmental, risk—legislated nonreturnable ban
3. Premium risk—consumer rejection of a premium package during an inflationary period
4. Nonexclusivity: (a) outside sales diminish marketing impact, (b) sales to others may be difficult with our ownership
5. Capital intensiveness—the project has an extremely long payback period
6. Negative EPS impact (accentuated by leveraging)
7. Near-term R&D expense
8. Corporate cash flow problems—funds needed for expansion of existing business
9. Price slashing by glass manufacturers and/or lower than projected glass inflation rate vis-à-vis plastic

- 10. Other plastic manufacturers may effect dramatic price cuts upon entry due to lower return on investment goals (many are in 7-10% range)
- 11. Entry in the container industry which is typified by lower margins and in which the key is to be the lowest cost producer. Implicit in the entry is the probable downward reassessment of our P/E.

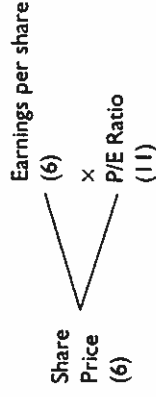
This looks like a terrible mess, but the sorting process for fixing it would be the same as in other cases. First, go down the list and see why he is complaining about each point. Why is each one considered to be a bad thing? This will allow you to see some patterns.

- 1. High cost
- 2. Prevented by law from doing
- 3. Force lower sales or lower price
- 4. Low sales
- 5. High investment, low ROI
- 6. Lower EPS
- 7. High cost
- 8. Must borrow
- 9. Force lower price
- 10. Force lower price
- 11. Low margins, lower P/E.

Whenever business people talk about things like costs, sales, prices, investment, and ROI, they are implying their knowledge of the relationships between these things as displayed on a standard ROI tree. If you impose the relevant points on such a tree, it is relatively easy to see what his message is:



The points about Earnings per Share and Price/Earnings Ratio suggest another tree:



We are then left with two points: No. 8, we must borrow, and No. 2, there is a risk that we won't be able to sell because of a ban on nonreturnable bottles. The borrowing point can be fitted into the tree if I add another layer below profits to make room for taxes and interest. I've left this out to make the technique easier to comprehend. If we try to put it all together, he appears to be saying:

We should think carefully before going into the plastic bottle business:

- If there is a nonreturnable ban, we may be precluded from doing so
- Even if there is no ban, it would dilute our profitability
- Short term, lower EPS
- Long term, lower ROI

Now that you see what the message is, you can scrutinize the individual points to make sure they are properly supported. I would guess they are not, only because I know that this particular company did go into the plastic bottle business and has made an immense success of it. What was left out of the author's thinking, apparently, was an assessment of the effect of plastic containers on the sales of the product.

The point I wish to reiterate is that you cannot tell that nonsense is being written unless you first impose a structure on it. It is the imposition of the structure that permits you to see flaws and omissions.

To summarize, I have tried to demonstrate with all these examples that checking order is a key means of checking the validity of a grouping. With any grouping of inductive ideas that you are reviewing for sense, always begin by running your eye quickly down the list. Are they indeed all from the same source: a process, a