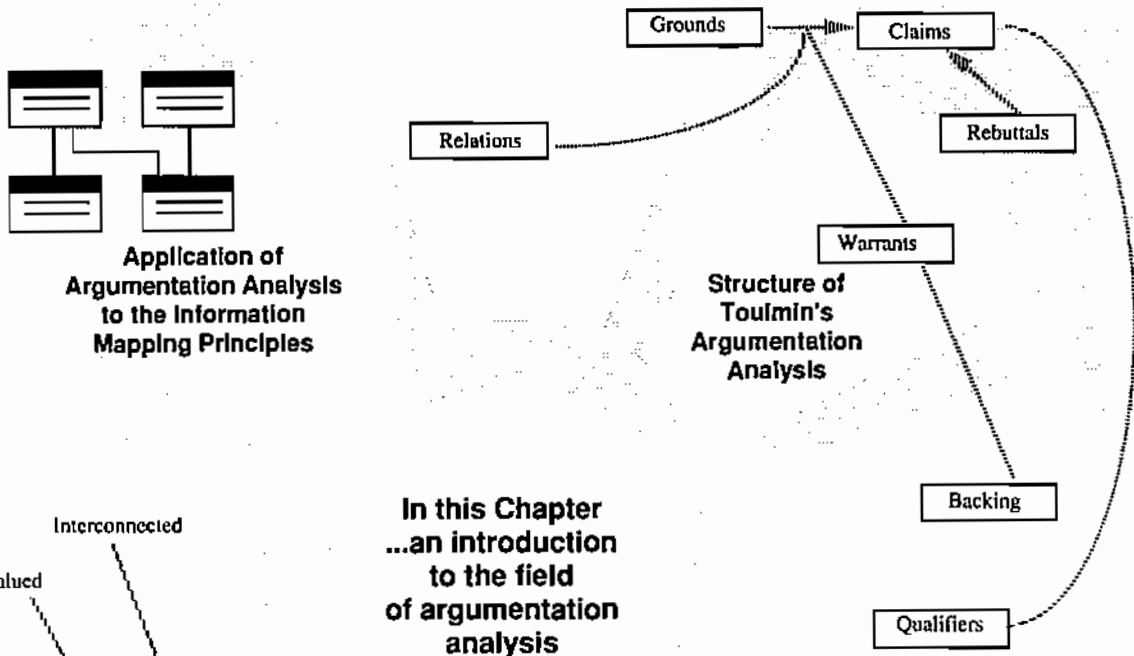
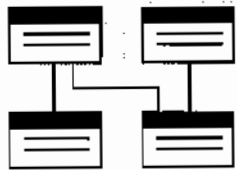


# Chapter 7

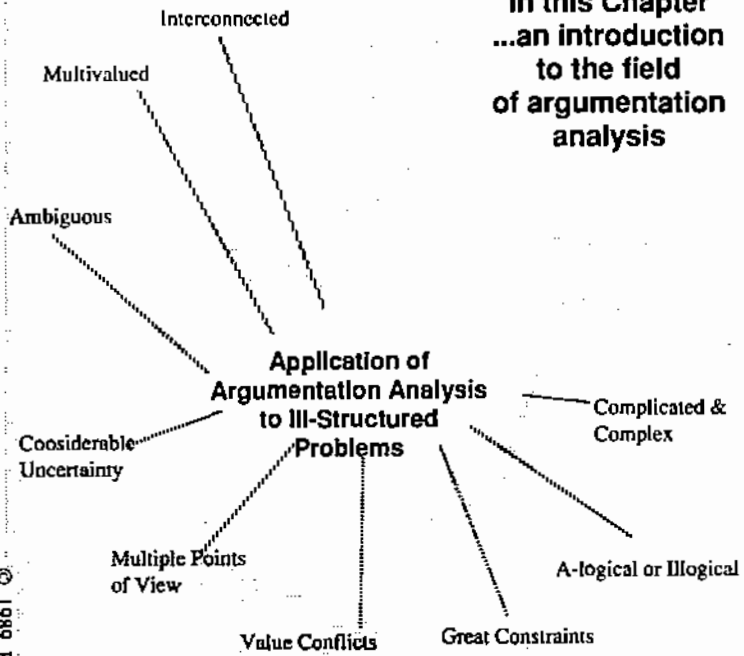
## Disputed Discourse: Argumentation Analysis



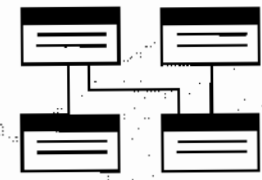
**Application of Argumentation Analysis to the Information Mapping Principles**



**In this Chapter  
...an introduction  
to the field  
of argumentation  
analysis**



**Application of Argumentation Analysis to a Scientific Problem**



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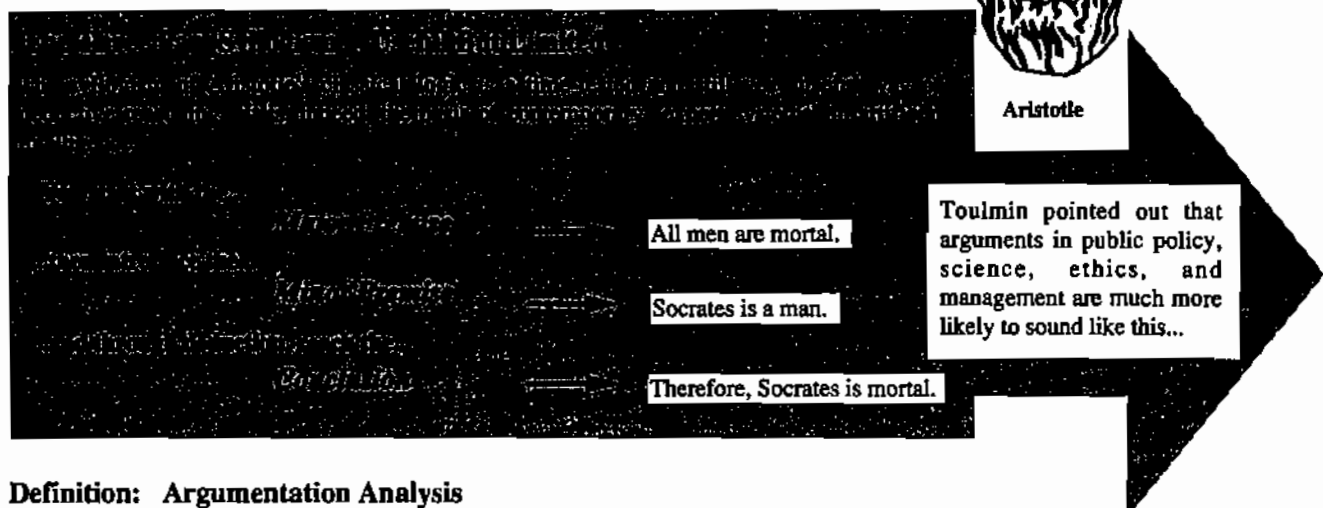
# Overview of This Chapter

## Different Kinds of Reasoning Require Different Kinds of Analysis

The British philosopher Stephen Toulmin and the Belgians, Chaim Perelman and L. Olbrechts-Tyteca have claimed that the reasoning process involved in most discussions about policy, ethics, law, and business strategy is more complex than the three part structure of the classic syllogism (i.e., major premise, minor premise, conclusion). They have suggested a way of capturing the subtleties and overall structure of reasoning processes. In this chapter we focus on the approach of Toulmin.

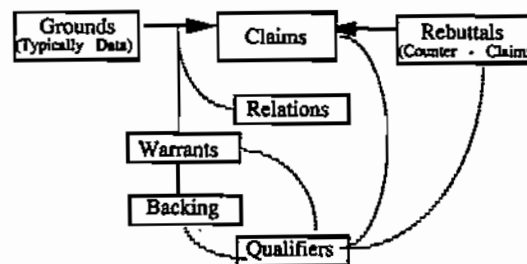


Aristotle

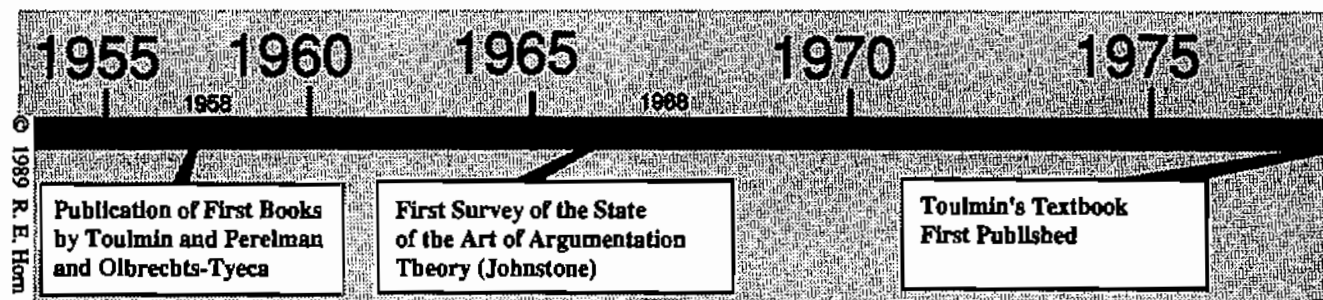


### Definition: Argumentation Analysis

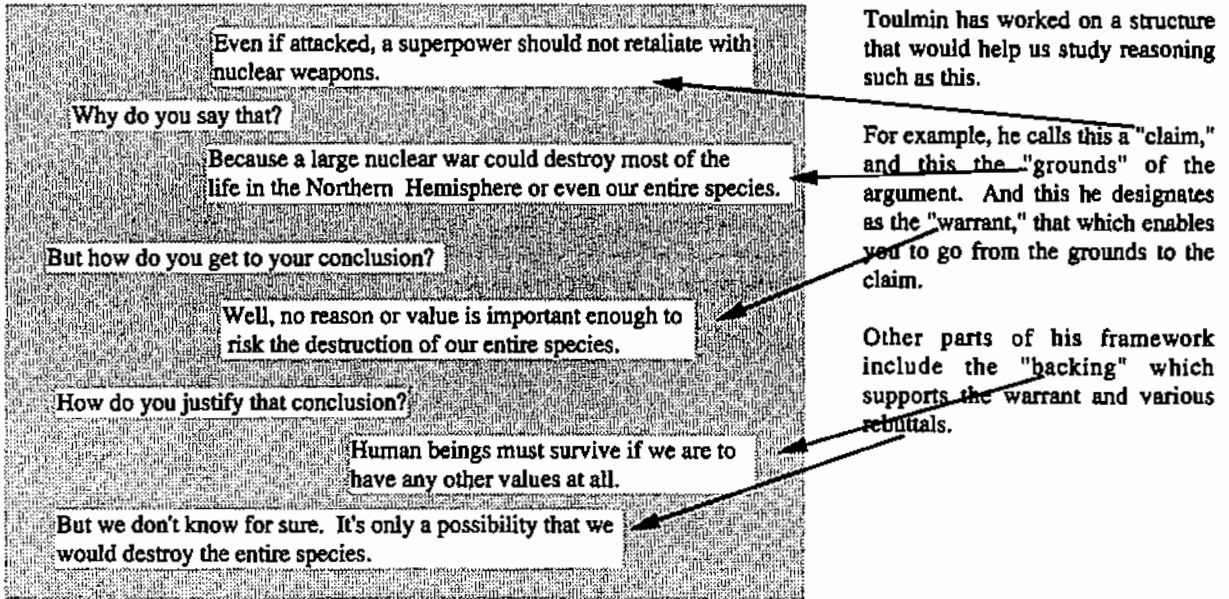
Argumentation analysis is a sentence-by-sentence examination of the components of an argument or a line of reasoning in order to identify the functions performed by the different sentences. This provides a structure of the argument. In the Toulmin version of argumentation analysis the functions are typically listed as in this diagram:



## Brief History of Argumentation Analysis



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**Commentary: Plan of This Chapter**

Argumentation analysis has a substantial history separate from hypertext. But a number of groups are computerizing it and considering the linked networks of blocks of information to be similar in intent and structure to other hypertext networks. From the standpoint of this book we place argumentation analysis in a position that helps link the two other discourse domains we deal with. We present the following two abbreviated examples of argumentation analysis in this chapter. (REH)

**Relatively well-structured problems**

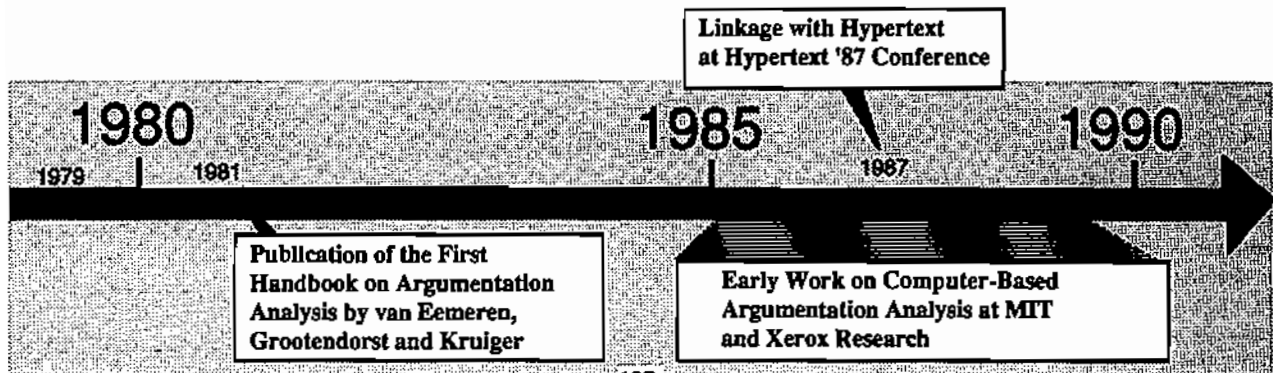
The rationale and research underpinning the 4 principles of Information Mapping's method.

see page 194

**Relatively ill-structured problems**

A portion of the current dispute over the ethics of using deterrence as a national policy in the era of nuclear weapons.

see page 200





# Claims

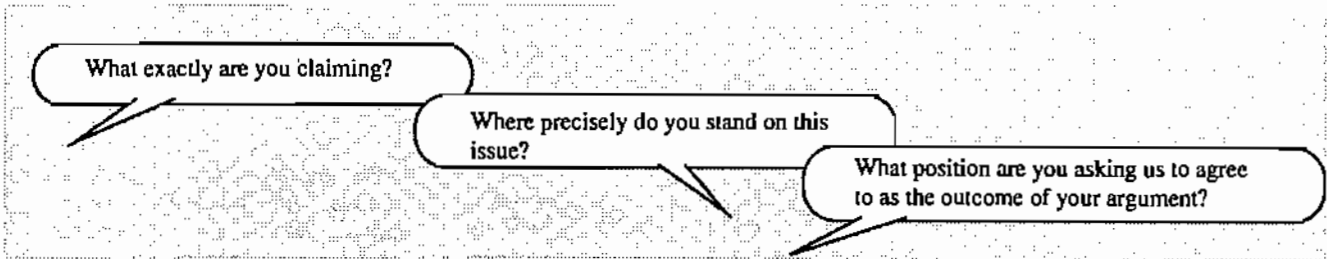
## Introduction

When we begin to examine a policy discussion or an ethical argument, there is always some "destination," some claim that one of the discussants advances.

## Definition

Claims are "assertions put forward publicly for general acceptance with the implication that there are underlying 'reasons' that could show them to be 'well founded' and therefore entitled to be generally accepted." (Toulmin, et. al. 1979)

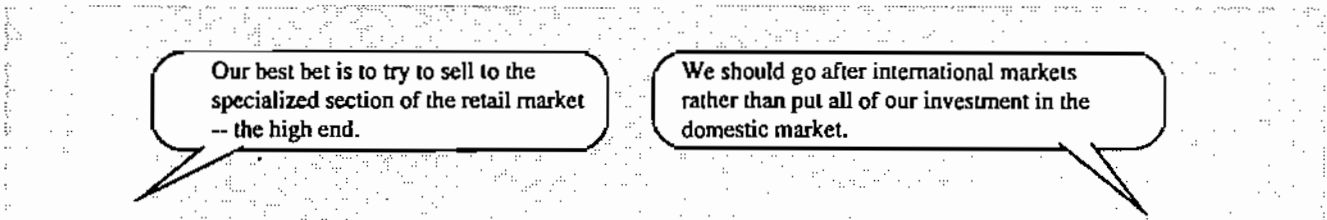
## Questions to be asked



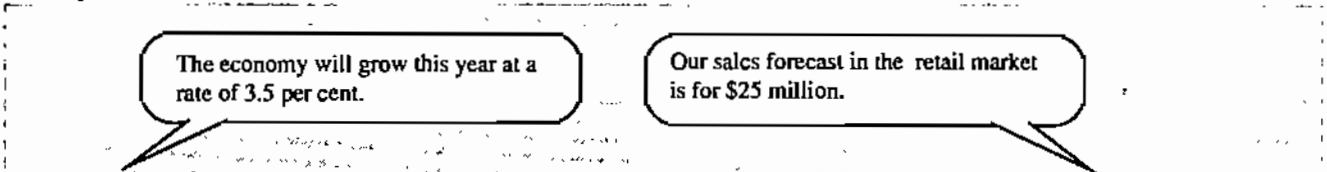
## Example one: claim as fact



## Example two: claim as policy proposal



## Example three: claim as forecast



## Form of the sentences

The form of sentences for claims is often one of the following:

- We should follow policy (x).
- We should (or should not) take action (a).
- If we follow policy (x) or action (a), state (s) will follow.
- (x) is a state that exists.

# Grounds (Data)

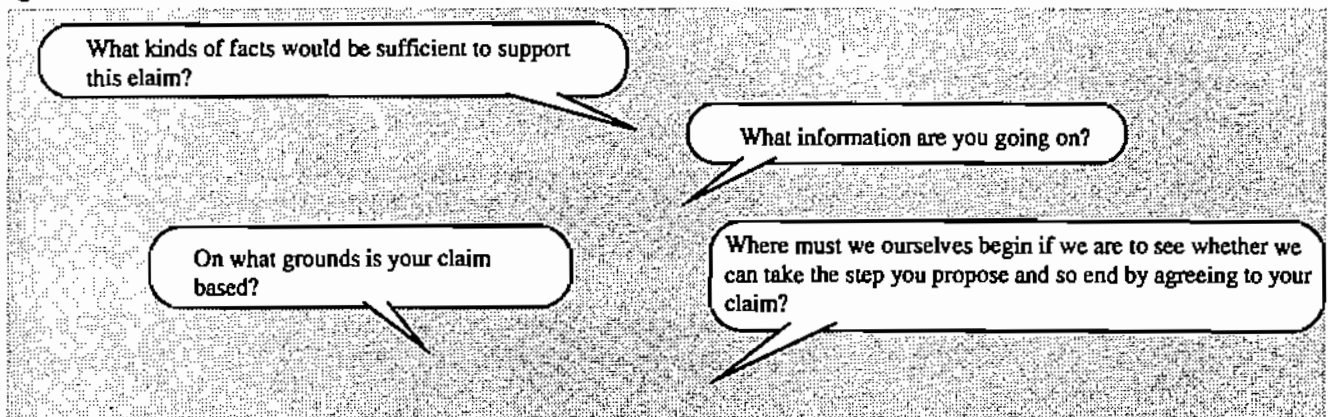
## Introduction

As we try to understand why somebody believes something, we may ask them exactly why they are making that claim and what they have to go on. Often their reply is in the form of data or facts that they believe to be true.

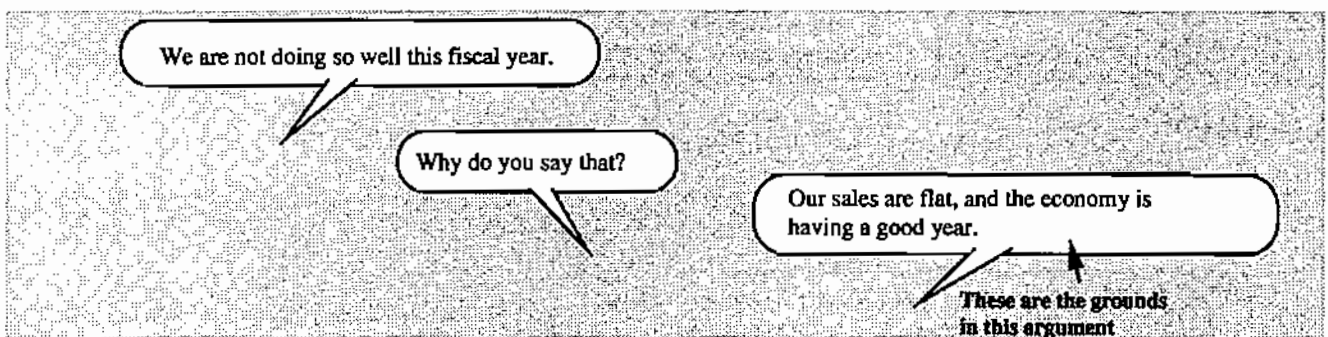
## Definition

"The term 'grounds' refers to the specific facts relied on to support a given claim." Toulmin (1979)

## Questions to be asked



## Example one



## Form of the sentences

The form of sentences in grounds is often the following:

- Situation (s) exists.
- (x) is a measurement that is (y).
- (x) is a conclusion drawn from the data collection methods we've used.



# Warrants

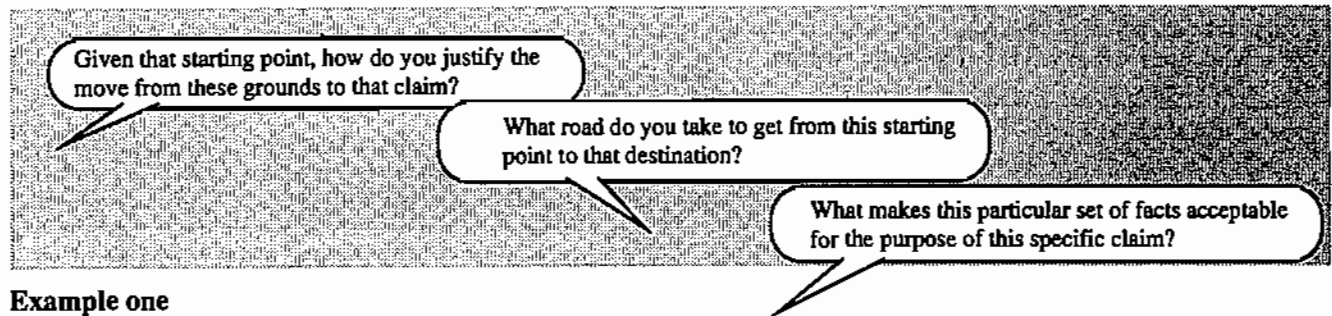
## Background.

"Historically speaking," the warrant "has always had close associations with the notion of a license or permit and also with that of a warranty or guarantee." Toulmin (1979)

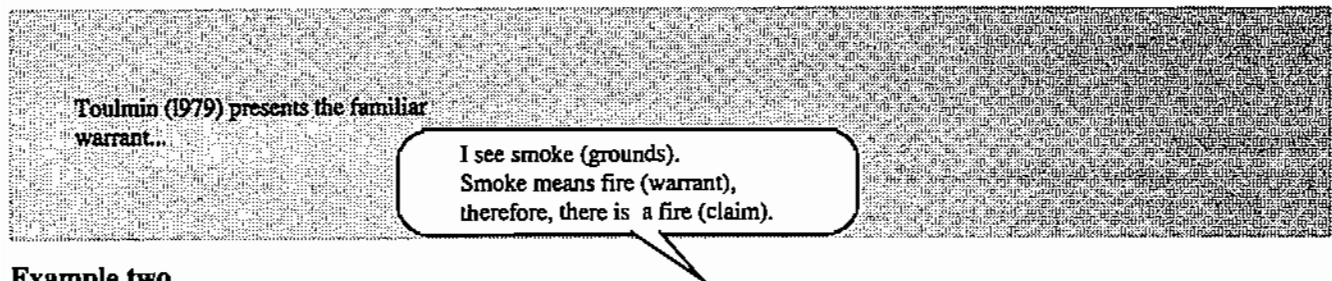
## Definition

The warrant is the assertion that entitles you to interpret or link the grounds (facts) as support for the claim.

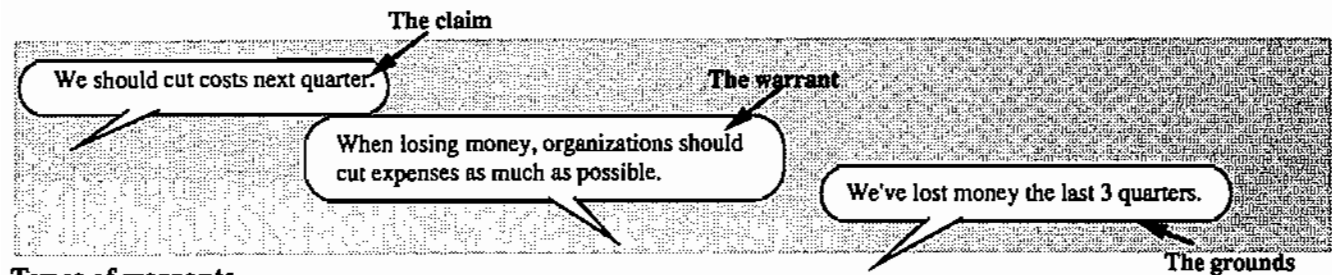
## Questions to be asked



## Example one



## Example two



## Types of warrants

Warrants usually "take the form of laws of nature, legal principles and statutes, rules of thumb, engineering formulas," moral commandments or principles.

## Form of the sentences

The form of sentences of warrants is often one of the following:

- Situation (s) indicates the presence of condition (c).
- When condition (c) exists, do action (a) to obtain goal (g).
- When situation (s) exists, follow policy (p).

# Backing

## Introduction

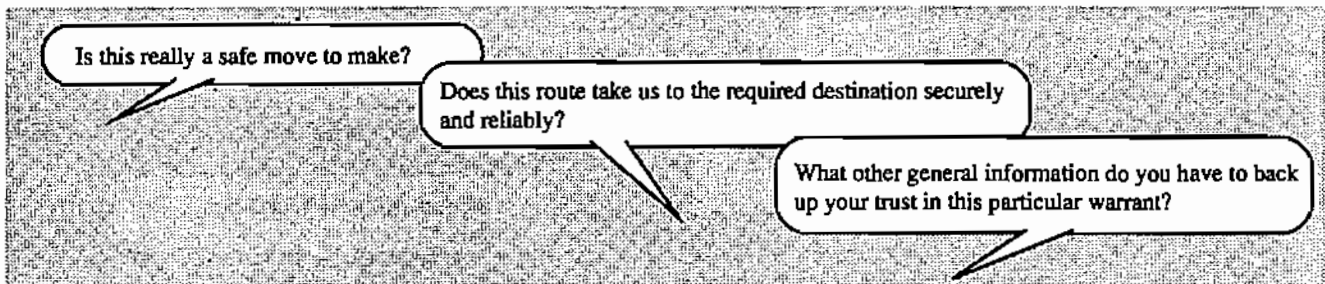
Sometimes we are not satisfied with the mere assertion of the warrant. We want more information. We want to understand why that warrant can hold in this situation.

## Definition

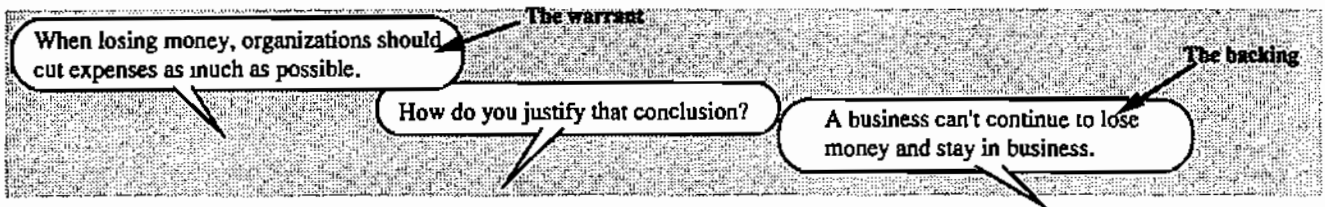
"The Backing consists of a very general set of background assumptions which, in effect, legitimize the basis for believing in the Warrant. That is, if the Warrant is not accepted on its surface, then the Backing is called into play to add deeper support to the argument."

(Mitroff and Mason, 1980)

## Questions to be asked



## Example



## Different kinds of backing

"The warrants relied on to authorize arguments in different fields of reasoning require correspondingly different kinds of backing: legal statutes must have been validly legislated; scientific laws must have been thoroughly checked out..."

Toulmin (1979)

Mitroff and Mason (1980) list four types of backing:

1. Cause-effect (given the truth of the evidence, the claim must follow)
2. Analogy (this situation is sufficiently like another to apply the same argument)
3. Belief in authority (someone powerful or credible argues that he or she believes (x) to be the case where (x) is a warrant)
4. Logical necessity (it is logically inconceivable or impossible that the claim would fail to occur given the evidence)



# Rebuttal

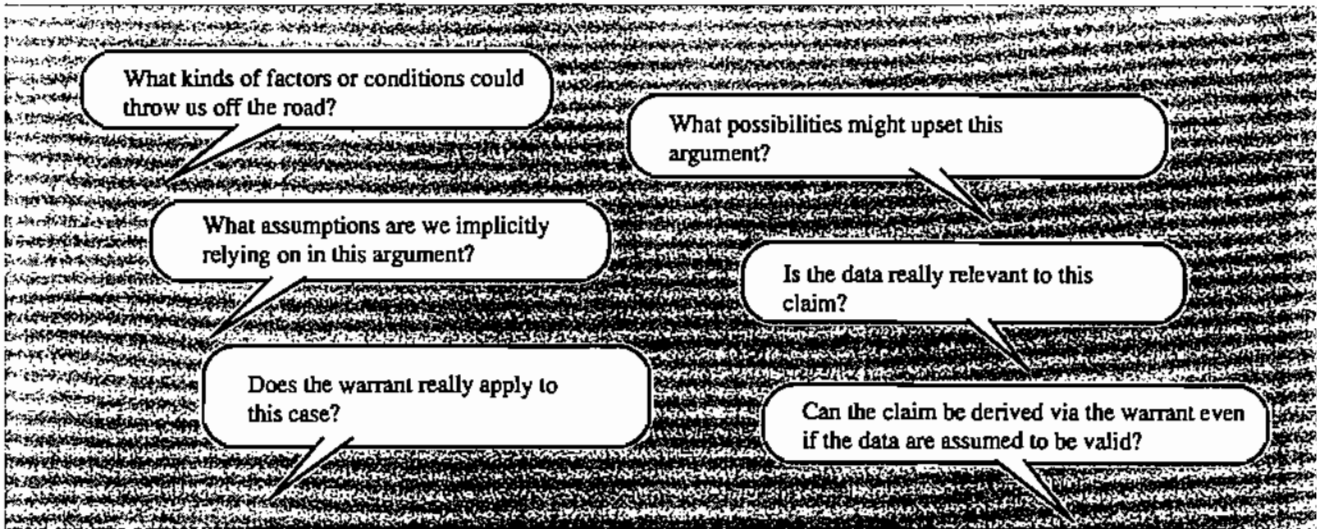
## Introduction

Rarely are we faced with an "airtight" situation or argument. Therefore, we need to know under what circumstances the current argument might not work.

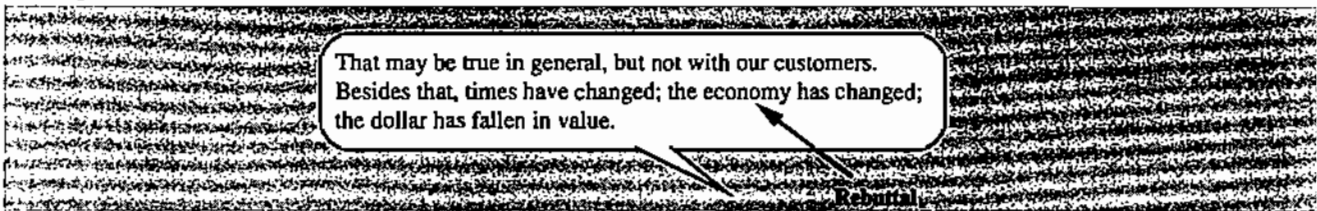
## Definition

The rebuttal presents the possible exceptions or objections as to why the claim, the grounds, the warrants, or the backing may not hold for the situation under discussion.

## Questions to be asked



## Example



## Types of rebuttal

There are several types of rebuttal:

1. **Grounds.** The facts are wrong (Situation (s) is not the case.).
2. **Warrants.** The warrant does not apply.  
(The warrant is wrong. E.g., do something else.)
3. **Backing.** False analogy or false belief.
4. **Claims.** We should take action B, not action A.  
(Situation (s) is not the case, so do some other action that is not-A.)



# Qualifiers

## Introduction

Every argument has a degree of certainty. We often refer to the limits of an argument. We cite its plausibility or degree of certainty.

## Definition

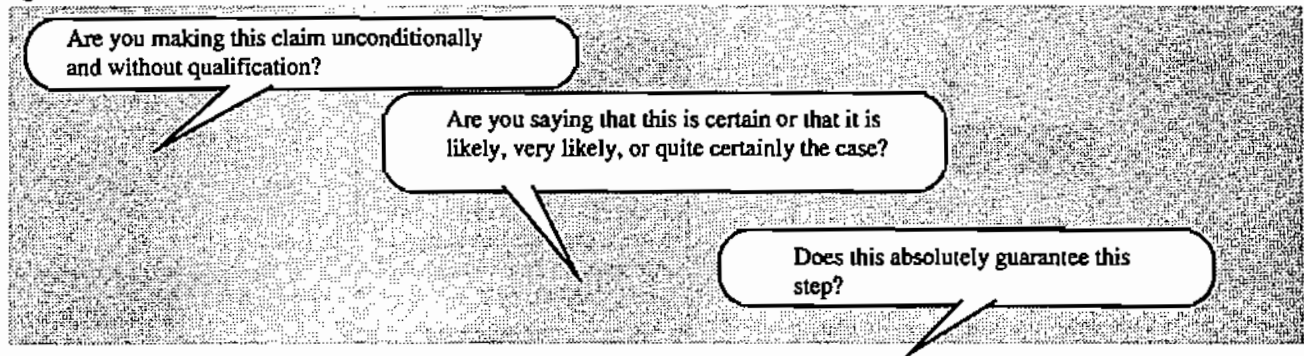
Qualifiers are those words that indicate how strongly the claim is being asserted, or how likely that something might occur.

## Examples of qualifiers

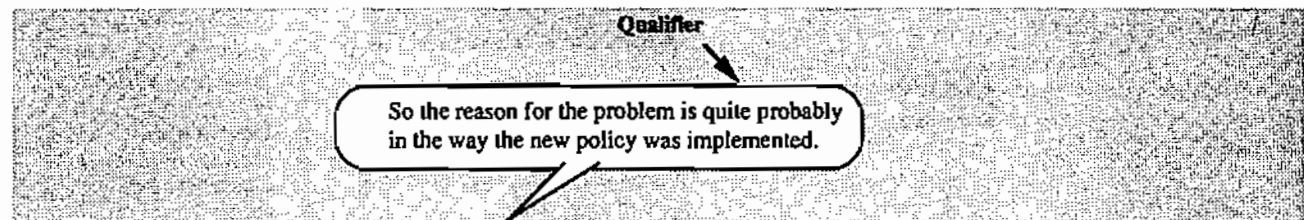
Here are some qualifiers that one frequently encounters in arguments:

- presumably
- very likely
- in all probability
- always
- certainly
- very possibly
- plausibly

## Questions to be asked



## Example

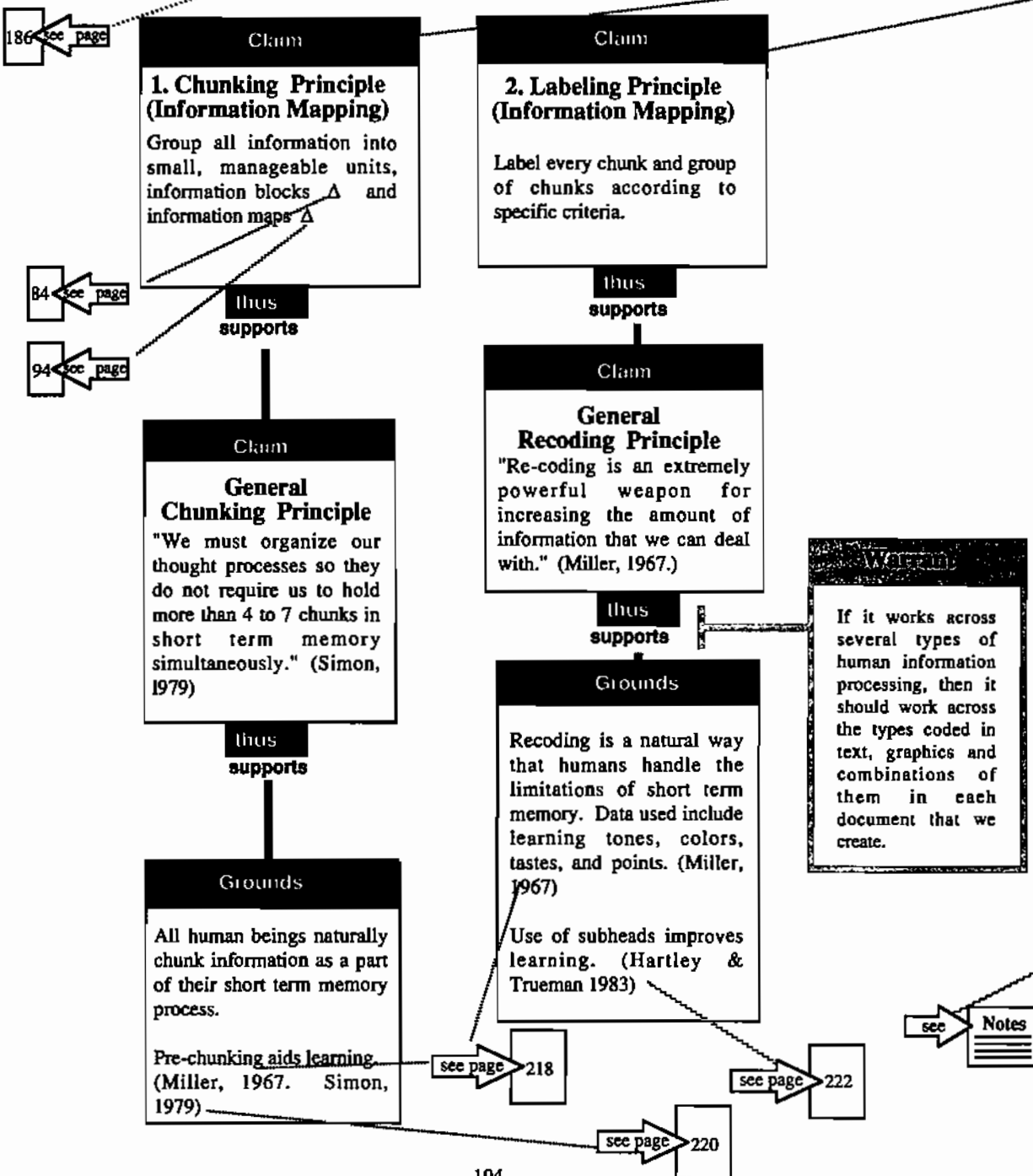


# Argumentation Analysis for Four Principles

## Application: Some Principles of Information Mapping's Method

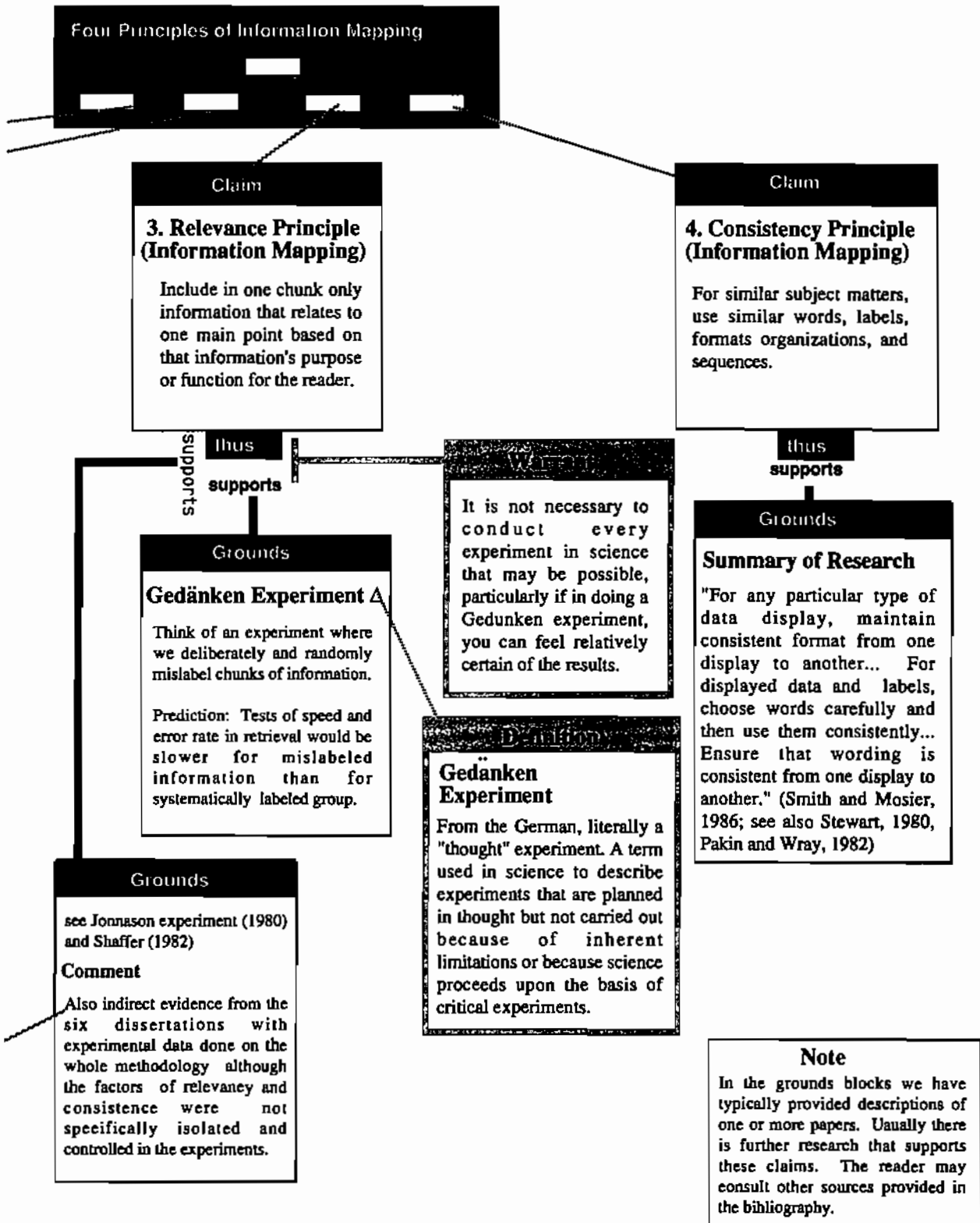
We present on this page an analysis of the rationale for using the four principles  $\Delta$  that we have claimed to be the foundations of Information Mapping's methodology. We use the argumentation analysis methodology  $\Delta$  presented in this book as a framework for presenting this rationale.

see page 85



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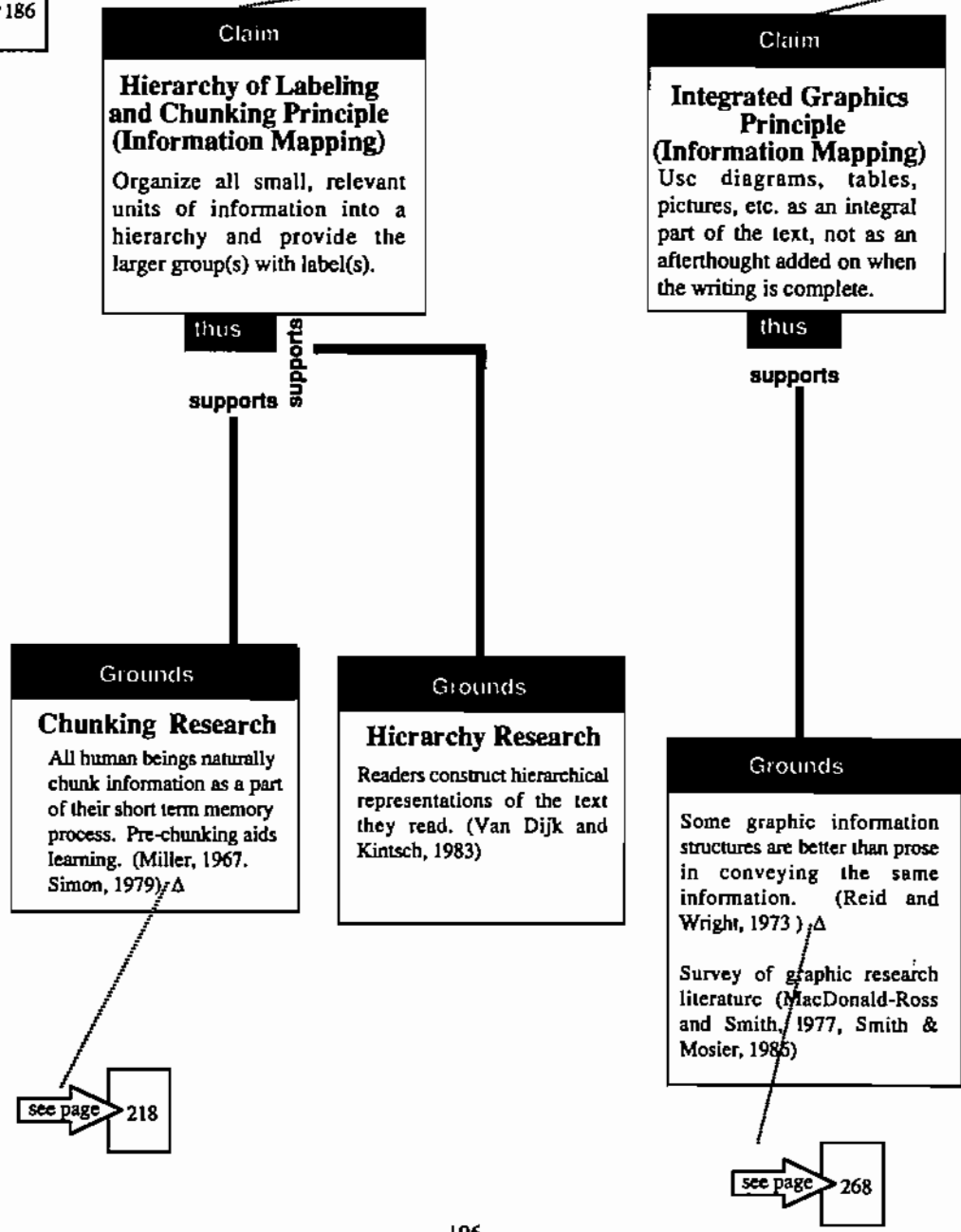
# Argumentation Analysis for Three More Principles

## Application: Information Mapping's Method

On the previous pages, we have presented an argumentation analysis framework supporting the four basic principles that we used to construct all information blocks. We present on this page three more principles that we used to guide development decisions in formulating Information Mapping's methodology. We use the argumentation analysis methodology presented in this book as a framework for presenting this rationale.

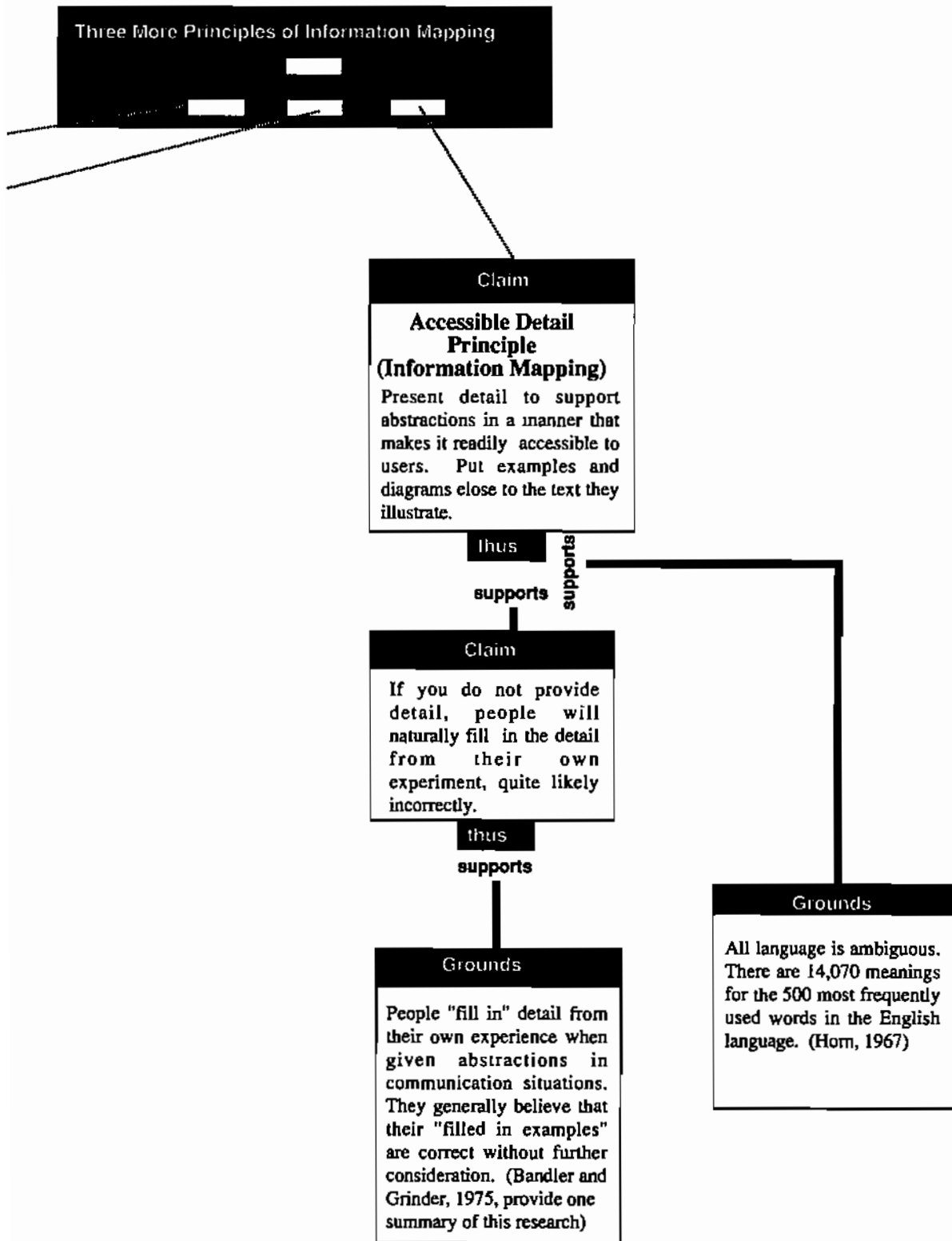
see page 85

see page 186



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# Useful in Representing Ill-Structured Problems

## Introduction

Only recently have researchers begun to study what can be called ill-structured problems, problems that defy easy definition and boundaries, and have little consensus as to their nature.

## Definition: Ill-Structured Problems

Ill-structured problems are those about which different people have very different perceptions and values concerning their nature, their causes, their boundaries, and their solutions. They are the problems that bring out two or more points of view from the first mention of them.

## Definition: Well-Structured Problems

Well-structured problems are textbook problems, problems which are most often used in training of scientists and engineers. There is widespread consensus as to their nature. They are logically coherent and consistent.

## Characteristics

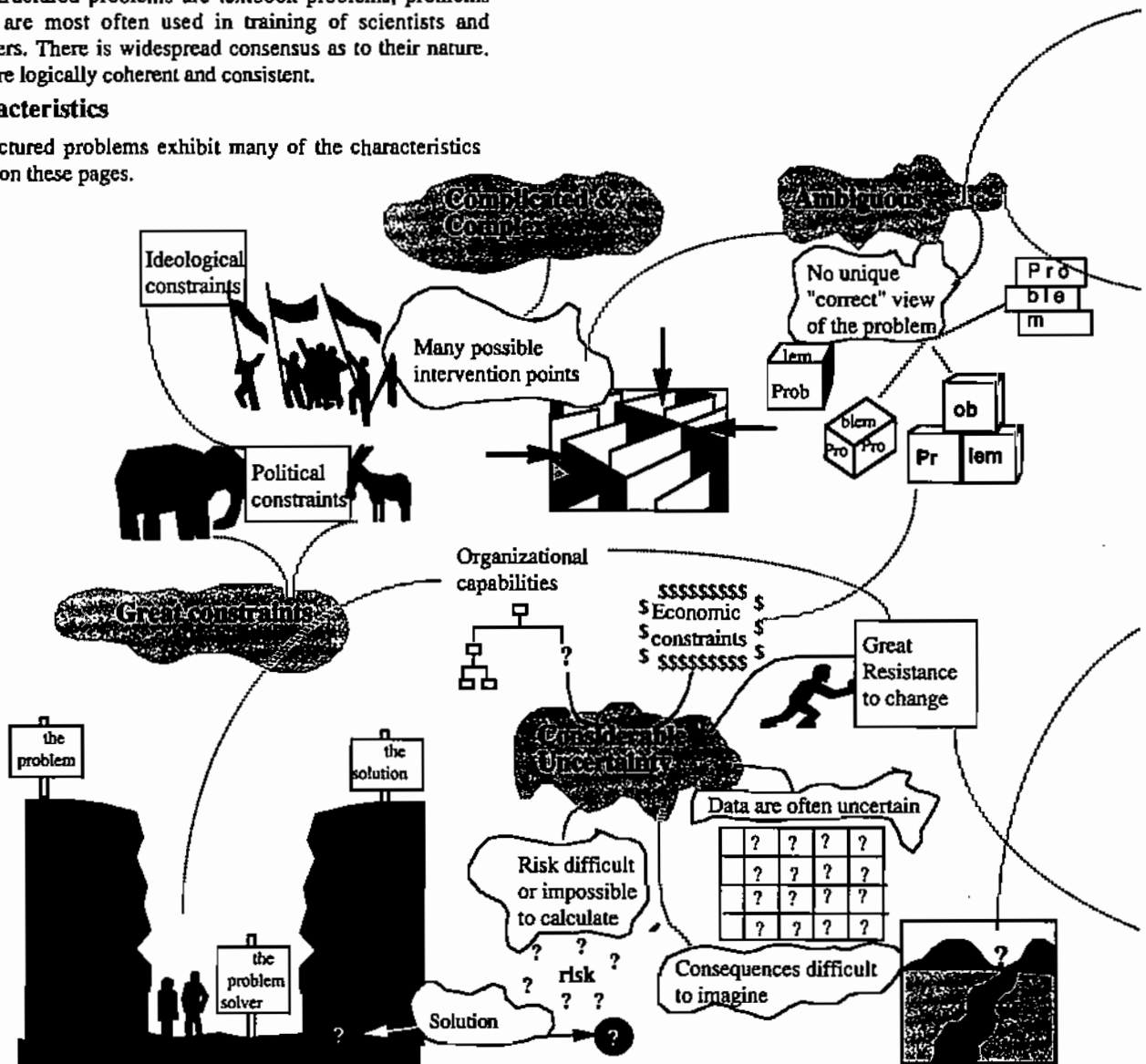
Ill-structured problems exhibit many of the characteristics shown on these pages.

## Example of the Analysis of Part of an Ill-Structured Problem



On the next few pages we present part of a case study in the ethics of using nuclear weapons. This is a field that is ill-structured. It meets many of the characteristics noted on this page.

see page 200

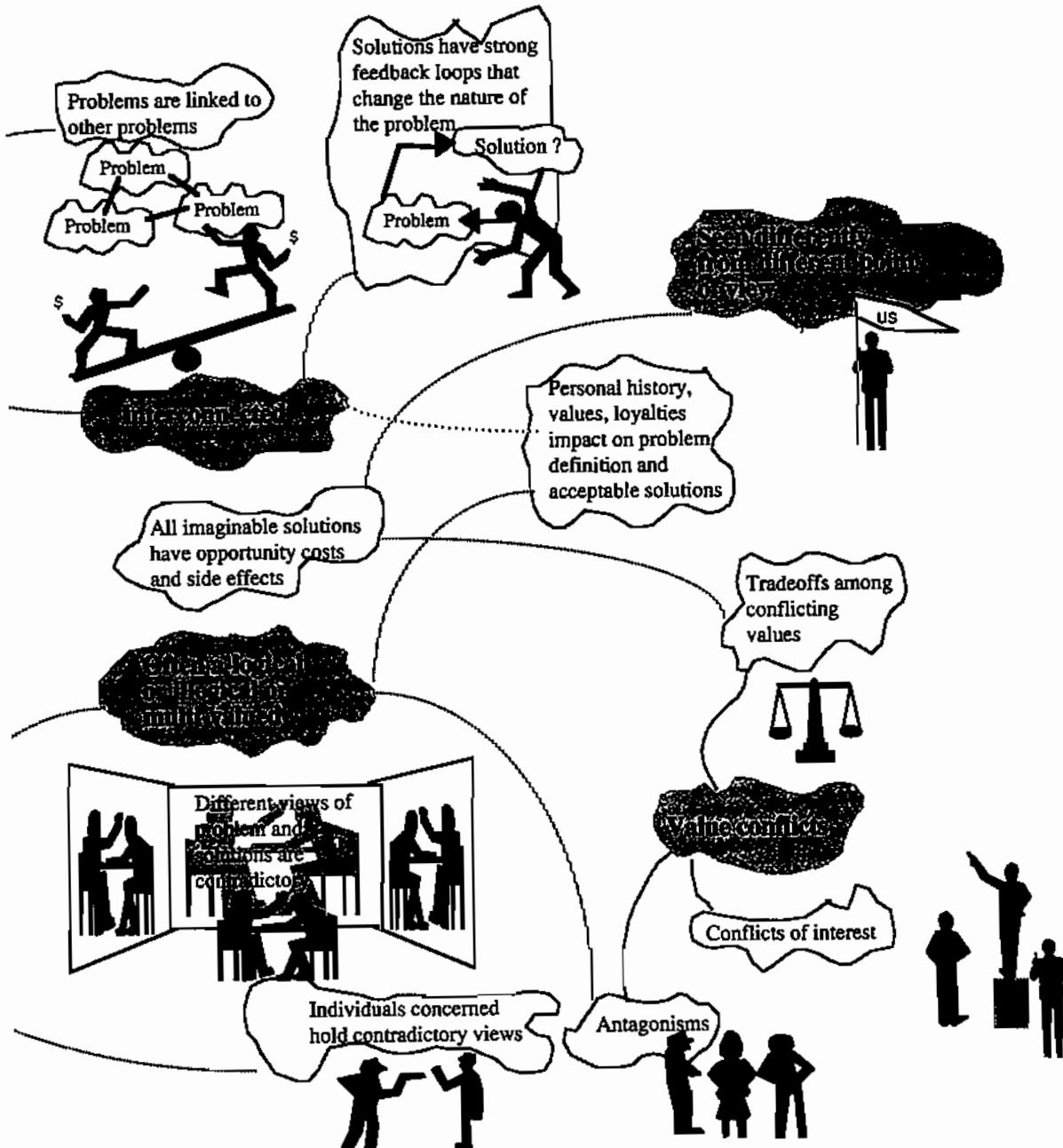


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**Commentary: Visual Structure**

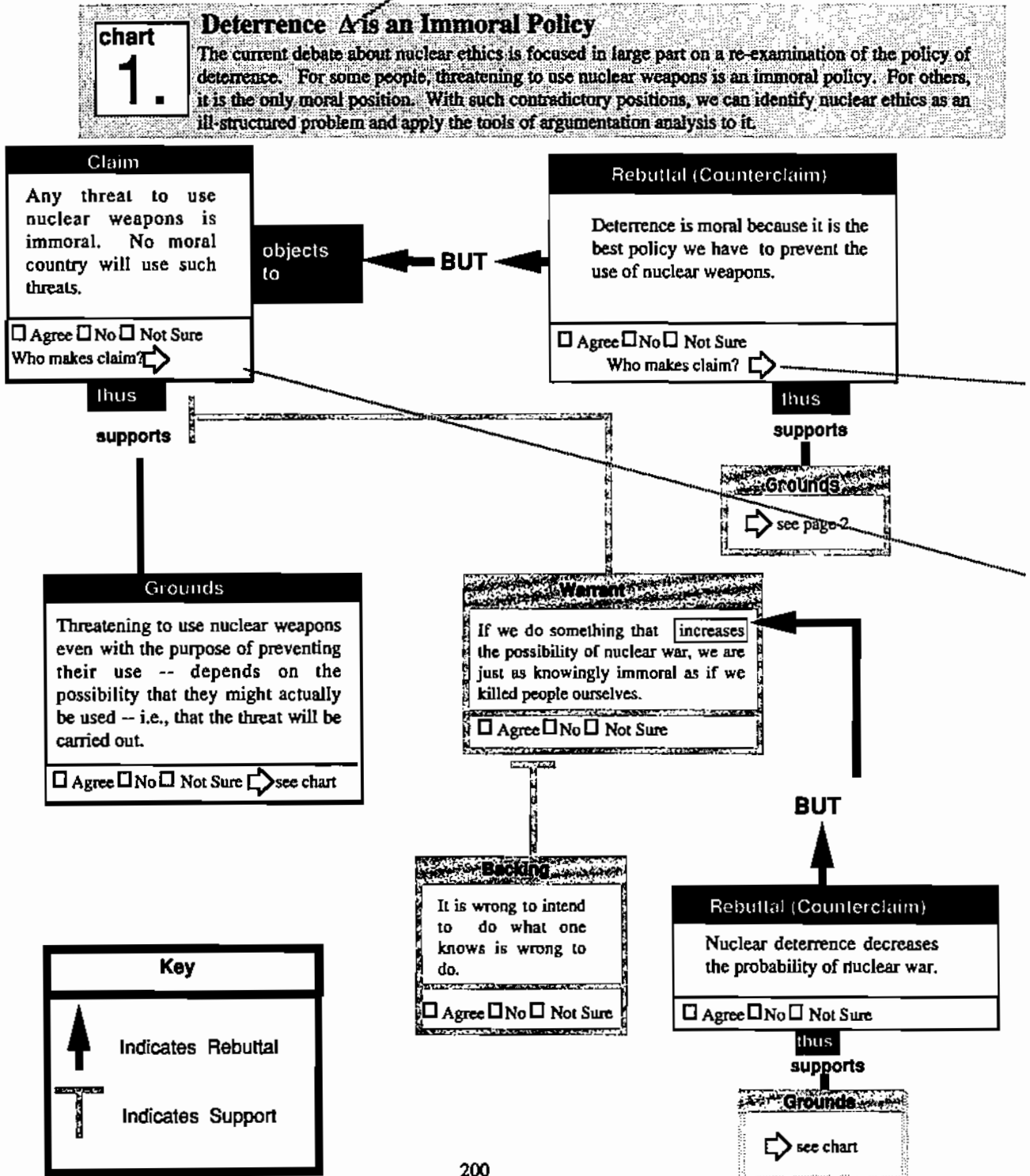
On this page I tried to illustrate visually how difficult it is to comprehend an ill-structured problem. I did that by making the visual elements very tangled and disorderly. I hope you get the "feel" of what I am trying to convey about ill-structured problems from this visual device. (REH)



# Case Study of a Poorly-Structured Problem

## Introduction

We present on the following pages the basic arguments that were argued in the 1980's over the ethics of the policy of nuclear deterrence to illustrate the application of argumentation analysis to ill-structured problems.





Definition

**Nuclear Deterrence**

1. a condition of the modern age of nuclear powers such that each superpower realizes that, if they started a nuclear war, the other superpower has sufficient invulnerable weapons to retaliate and potentially destroy their military forces, culture and cities. 2. any policy of a nuclear nation that tends to promote or continue the condition of nuclear deterrence. It is a policy in which both superpowers think: "We will not start a nuclear war because the other side threatens to retaliate and destroy us and we think they could and would do that."

**Who Makes This Claim?**

"It makes no sense to reject deterrence simply because it may not be infallible; it makes sense to reject it only if it proves more dangerous than the alternatives."

—Charles Krauthammer



**Who Makes This Claim?**

**In Defense of  
Creation: The  
Nuclear Crisis  
and a Just Peace**

By  
The Council of  
Bishops of the  
United Methodist  
Church

(1986)

The Bishops of the United Methodist Church said in their pastoral letter (1986): "We have said a clear and unconditional 'no' to nuclear war and to any use of nuclear weapons. We have concluded that nuclear deterrence is a position which cannot receive the church's blessing...the ideology of deterrence must not receive the churches' blessing, even as a temporary warrant for holding on to nuclear weapons. The lingering possession of such weapons for a strictly limited time requires a very different justification: an ethic of reciprocity as nuclear-weapon states act together, in agreed stages, to eliminate their nuclear weapons."

# Case Study Brings Together Opposing Viewpoints

## Introduction

These two pages are a continuation of the basic arguments that were argued in the 1980's over the ethics of the policy of nuclear deterrence to illustrate the application of argumentation analysis to ill-structured problems.

see page 200

**chart 2.** **Deterrence prevents war; therefore it is the only morally acceptable policy.**  
 The counterclaim of the immorality of deterrence is that deterrence is moral. The argumentation analysis outlining the main structure of this argument is presented on this page.

**Definition**  
 see chart 1.

**Rebuttal (Counterclaim)**  
 Deterrence has too many risks in the face of the possibilities of inadvertent outbreak of nuclear war.  
 Agree  No  Not Sure  
 Who makes claim? → see chart

**BUT**

**Claim**  
 Deterrence is moral because it is the best policy we have to prevent the use of nuclear weapons.  
 Agree  No  Not Sure  
 Who makes claim? →

**BUT**

**thus supports**

**Pragmatic Argument for Deterrence Policy**  
 Before throwing out what has worked to keep the peace and prevent nuclear war, you must come up with a better moral alternative. Otherwise it is morally better to keep the policy you have.  
 Agree  No  Not Sure → see chart

**Deterrence is less dangerous than its alternatives.**  
 Deterrence may not be perfect as a policy but it is less dangerous than its alternatives.  
 Agree  No  Not Sure see chart

**Key**  
 ↑ Indicates Rebuttal  
 T Indicates Support

**Grounds**  
 Deterrence prevents nuclear war by making both sides afraid of starting a war because they will surely lose more than they could possibly gain and could conceivably completely destroy their own country.  
 Agree  No  Not Sure → see chart

**Grounds**  
 The policy of deterrence has worked for 40 years. Since 1945 there has been no nuclear war and no conventional war between superpowers.  
 Agree  No  Not Sure → see chart

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**Rebuttal  
(Counterclaim)**

Any threat to use nuclear weapons is immoral. No moral country will use such threats.

Agree  No  Not Sure  
Who makes claim? → see chart 1

**BUT** ← **Rebuttal  
(Counterclaim)**

Nuclear war risks the future of the human species and risking the future of human species is not worth protecting the values claimed to be protected.

Agree  No  Not Sure  
Who makes claim? → see chart...

**Who Makes This Claim?**

"Nuclear war is such an emotional subject that many people see the weapons themselves as the common enemy of humanity. Nuclear weapons are intrinsically neither moral nor immoral, though they are more prone to immoral use than most weapons. But they can be used to accomplish moral objectives and can do this in ways that are morally acceptable. The most obvious and important way is to use them or their availability to deter others from using nuclear weapons. The second -- of much lower, but still significant priority -- is to use them to help limit the damage (human, social, political, economic, and military) that could occur if deterrence fails. Anything that reduces war-related destruction should not be considered altogether immoral."

--Herman Kahn

**Thinking  
About the  
Unthinkable**

By  
Herman  
Kahn

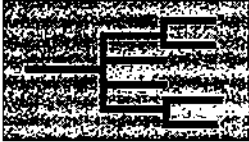
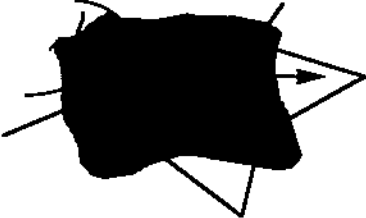
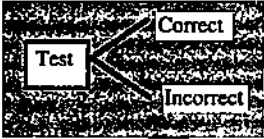
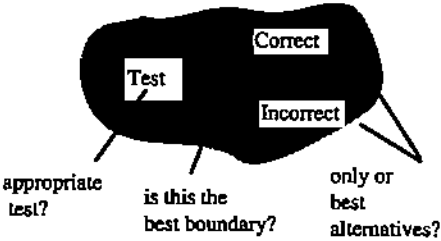
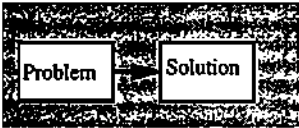

for other quotes see → Chart 1.



# Comparing Ill-Structured and "Tame" Problems

## Introduction.

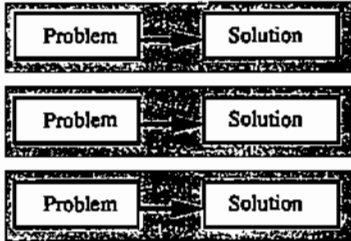
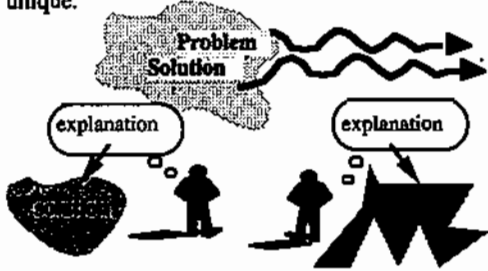
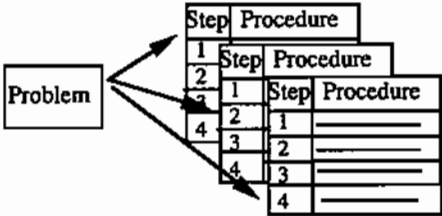
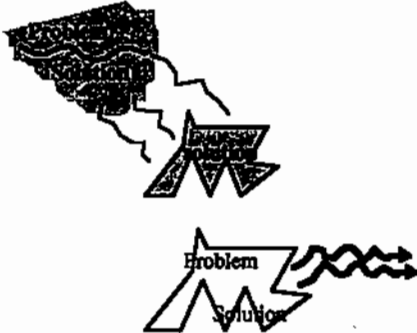
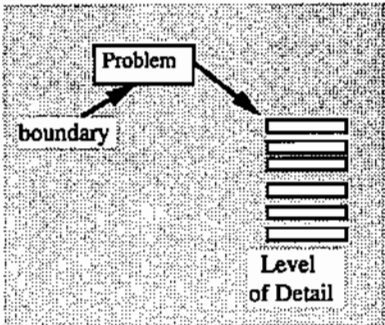
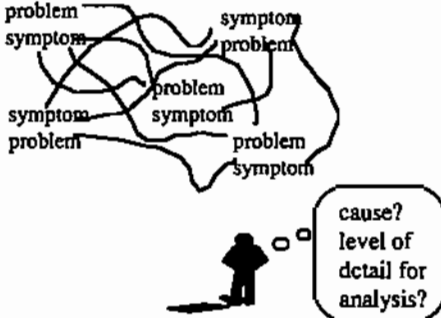
Ill-structured problems can best be seen if we look at them in comparison with "tame" or "well structured" problems, as in the chart below.

Characteristics	Tame Problems	Ill-Structured Problems
<b>Ability to formulate the problem</b>	Can be formulated exhaustively and written down definitively. 	No definitive formulation 
<b>Ability to devise and conduct definitive tests</b>	Can be tested. Mistakes and errors can be identified. 	No single criterion to determine correctness. Difficult to determine when a solution is a solution or even whether a test is applicable. 
<b>Relationship between problem and solution</b>	Problems can be formulated separately from solutions. 	Solving the problem is synonymous with understanding it in the first place. 
		Each formulation of an ill-structured problem contains a definition of the solution.

Characteristics	Tame Problems	Ill-Structured Problems										
<p><b>Ability to determine whether problem has been solved</b></p>	<p>Have a clear ending point and a determinable solution.</p>	<p>No stopping criteria...the problem may be ongoing and continuously changing, so there is no way of determining completion.</p>										
	<p>A clear rule or test can be stated to determine completion.</p>											
<p><b>Traectability</b></p>	<p>Exhaustive list of operations used to solve problem exists.</p>	<p>No list of operations exists for solving ill-structured problems.</p>										
	<table border="1"> <thead> <tr> <th>Step</th> <th>Procedure</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>_____</td> </tr> <tr> <td>2</td> <td>_____</td> </tr> <tr> <td>3</td> <td>_____</td> </tr> <tr> <td>4</td> <td>_____</td> </tr> </tbody> </table>	Step	Procedure	1	_____	2	_____	3	_____	4	_____	
Step	Procedure											
1	_____											
2	_____											
3	_____											
4	_____											
<p><b>Relationship between explanation and solution</b></p>	<p>Can be stated as a discrepancy between what is and what could or ought to be, and an explanation exists for every gap.</p>	<p>Many possible explanations and each one "contains" or "implies" a different solution.</p>										

# Comparing Ill-Structured and "Tame" Problems

continued

Characteristics	Tame Problems	Ill-Structured Problems
<p><b>Uniqueness or reproducibility of problem</b></p>	<p>Problems can be abstracted from the real world and similar solutions can be found.</p> 	<p>Each problem and each solution is unique.</p> 
<p><b>Repeatability of solutions</b></p>	<p>Attempts to solve can be made repeatedly until one works.</p> 	<p>You cannot undo what you have tried, so that each solution is unique and changes the nature of the problem.</p> 
<p><b>Level of analysis</b></p>	<p>Identifiable, "natural" form with high degree of certainty...level of detail for solving the problem can be found...and boundaries for the problem are reasonably easy to agree upon.</p> 	<p>No identifiable causes...every "symptom" is a problem and vice versa...level of detail and approach are not easy to define...little agreement on setting boundaries of the problem.</p> 

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# Conclusions: Argumentation and Hypertext

## Summary

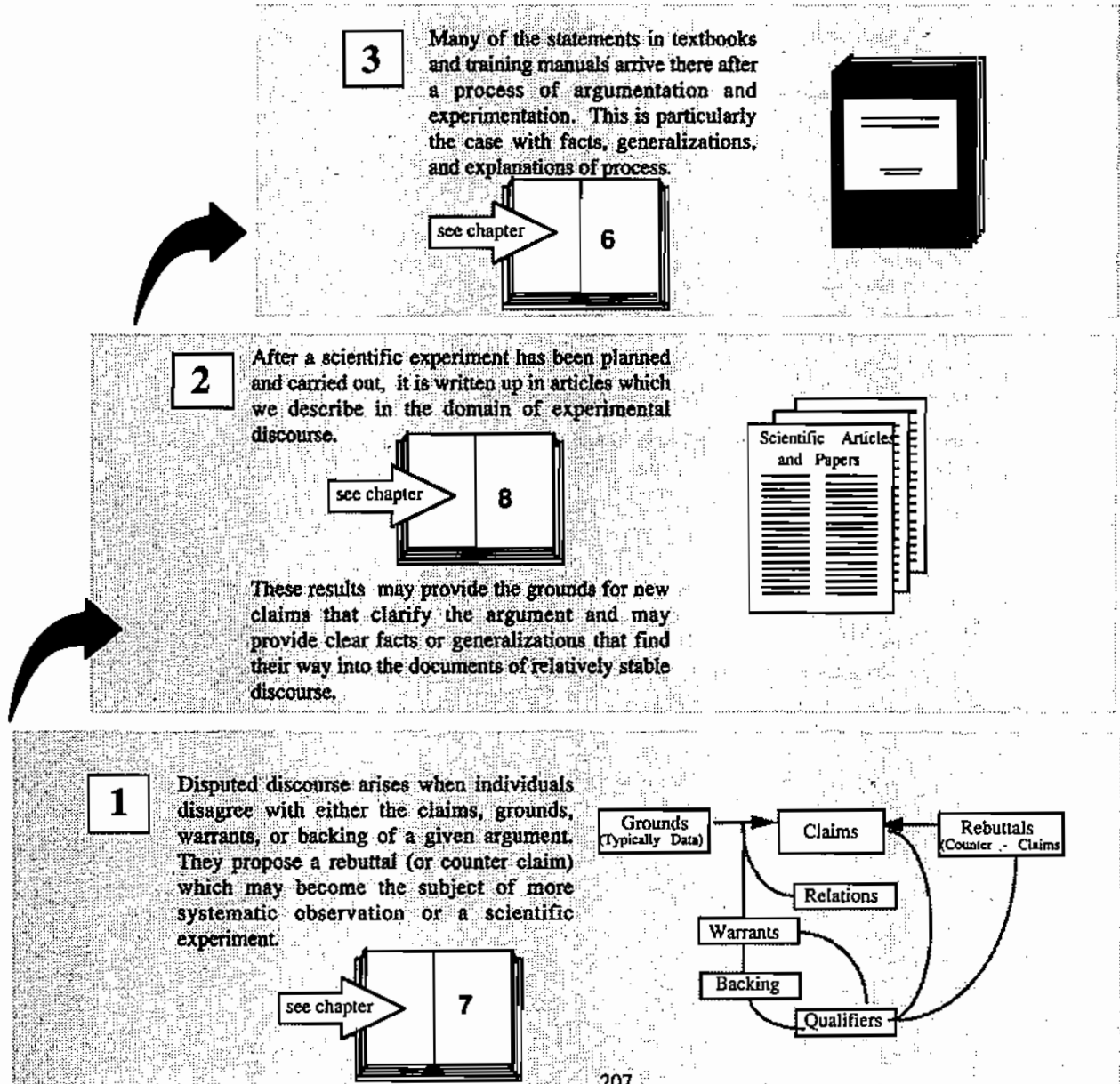
Argumentation is a different kind of discourse from relatively stable subject matter. We have seen in this chapter that it is useful to clarify the components of a disagreement by identifying exactly what the claims, grounds, warrants, etc., are. And it is useful to use a more graphic way of displaying these components.

## Connection With Other Types of Discourse

How does argumentation analysis relate to the other major types of discourse we have presented in this book? On this page we show the major connections with other types of discourse discussed in this book.

### Commentary: Usefulness of Argumentation Analysis

It is quite possible that argumentation analysis, as described in this chapter, will provide a method for slowing down disputes and looking very carefully at the merits of different points of view. Obviously, many disputes can be conducted without it. In other disputes we will be able to use argumentation analysis as a kind of "microscope" to look at the argument quite closely for any flaws or weaknesses. For that, it will become a significant tool. (REH)



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