they’re being treated fairly and that their competitors and neighbors are also paying what is due. If the public concludes that the IRS cannot meet these basic expectations, the risk to the tax system will become very high, and the effects very difficult to reverse.


10. People and governments want to talk, talk, talk about racism and other forms of intolerance; we are obsessed with racial and ethnic issues. But we come to these issues wearing earplugs and blinders, and in a state of denial that absolves us of complicity in any of these hateful matters. Thus, the other guy is always wrong.


2.2 Diagramming Arguments

A second technique for the analysis of arguments is diagramming. With a diagram we can represent the structure of an argument graphically; the flow of premises and conclusions is displayed in a two-dimensional chart, or picture, on the page. A diagram is not needed for a simple argument, even though drawing one can enhance our understanding. When an argument is complex, with many premises entwined in various ways, a diagram can be exceedingly helpful.

To construct the diagram of an argument we must first number all the propositions it contains, in the order in which they appear, circling each number. Using arrows between the circled numbers, we can then construct a diagram that shows the relations of premises and conclusions without having to restate them. To convey the process of inference on the two-dimensional page, we adopt this convention: A conclusion always appears in the space below the premises that give it support; coordinate premises are put on the same horizontal level. In this way, an argument whose wording may be confusing can be set forth vividly in iconic form. The structure of the argument is displayed visually.3

Here follows a straightforward argument that may be readily diagrammed:

1 There is no consensus among biologists that a fertilized cell is alive in a sense that an unfertilized egg or unused sperm is not. 2 Nor is there a consensus about whether a group of cells without even a rudimentary nervous system is in any sense human. 3 Hence there are no compelling experimental data to decide the nebulous issue of when “human” life begins.4
The circled numbers serve to represent the propositions, so we can diagram the argument as follows:

When the several premises of an argument are not all coordinate—that is, when some premises give direct support not to the conclusion but to other premises that support the conclusion—the diagram can show this quite clearly. Here is an argument illustrating this feature of diagramming:

1. Football analysis is trickier than the baseball kind because 2. football really is a team sport. 3. Unlike in baseball, all eleven guys on the field are involved in every play. 4. Who deserves the credit or blame is harder to know than it looks.5

The diagram looks like this:

An alternative plausible interpretation of this argument can be represented by a different diagram:
Another strength of diagrams is their ability to exhibit relations *between* the premises that may be critical to the argument. Each premise of an argument may support its conclusion separately, as in the arguments above. In some arguments, however, the premises support the conclusion only when they are considered *jointly*—and this is a feature of the reasoning that a diagram is well suited to display, by providing a visual representation of that connection. The following argument illustrates this:

1. General Motors makes money (when it does) on new cars and on the financing of loans. 2. Car dealers, by contrast, make most of their money on servicing old cars and selling used ones. 3. So car dealers can thrive even when the automaker languishes. 6

By bracketing the premises in the diagram of this argument, we show that its premises give support only because they are *joined together*, thus:

![Diagram]

In this argument, neither premise supports the conclusion independently. It is the combination of the facts that General Motors makes most of its money in one way, while car dealers make most of their money in another way, that supports the conclusion that the latter may thrive while the former languishes.

Often we can *show* what we cannot as conveniently say. Diagrams are particularly useful when an argument’s structure is complicated. Consider the following argument:

1. Desert mountaintops make good sites for astronomy. 2. Being high, they sit above a portion of the atmosphere, enabling a star’s light to reach a telescope without having to swim through the entire depths of the atmosphere. 3. Being dry, the desert is also relatively cloud-free. 4. The merest veil of haze or cloud can render a sky useless for many astronomical measures. 7

Proposition 1 is plainly the conclusion of this argument, and the other three provide support for it—but they function differently in giving that support. Statement 2 supports, by itself, the claim that mountaintops are good sites for telescopes. But statements 3 and 4 must work together to
support the claim that desert mountaintops are good sites for telescopes. A diagram shows this neatly:

Some complications may be revealed more clearly using paraphrase. When an argument has a premise that is not stated explicitly, a paraphrase allows us to formulate the tacit premise and then add it to the list explicitly. A diagram requires the representation of the tacit premise in some way that indicates visually that it has been added (a broken circle around a number is commonly used), but even then the added premise remains to be precisely formulated. Thus the argument

Since there are no certainties in the realm of politics, politics must be the arena for negotiation between different perspectives, with cautious moderation likely to be the best policy.

is best clarified by a paraphrase in which its tacit premise and internal complexity is made explicit, thus:

1. There are no certainties in the realm of politics.
2. Where there are no certainties, those with different perspectives must negotiate their differences.
3. The best policy likely to emerge from such negotiation is one of cautious moderation.
4. Therefore politics is the realm for negotiation between different perspectives, with cautious moderation likely to be the best policy.

The number of arguments in a passage is determined, most logicians agree, by the number of conclusions it contains. If a passage contains two or more arguments, and a number of propositions whose relations are not obvious, a diagram may prove particularly useful in sorting things out. A passage in a letter from Karl Marx to Friedrich Engels illustrates this nicely:

1. To hasten the social revolution in England is the most important object of the International Workingman's Association. 2. The sole means of hastening it is to make Ireland independent. Hence 3. the task of the "International" is everywhere
to put the conflict between England and Ireland in the foreground, and everywhere to side openly with Ireland.⁹

There are two conclusions in this passage and hence two arguments. But both conclusions are inferred from the same two premises. A diagram exhibits this structure:

```
  1  2
   \ /
    3 4
```

Two conclusions (and hence two arguments) may have a single stated premise. For example,

> Older women have less freedom to fight sexual harassment at their jobs or to leave a battering husband, because age discrimination means they won’t easily find other ways of supporting themselves.¹⁰

The single premise here is that older women cannot easily find alternative ways to support themselves. The two conclusions supported by that premise are (a) that older women have less freedom to fight sexual harassment at their jobs, and (b) that older married women have less freedom to leave a battering husband. A *single argument* ordinarily means an argument with a single conclusion, regardless of how many premises are adduced in its support.

When there are two or more premises in an argument, or two or more arguments in a passage, the order of appearance of premises and conclusions may need to be clarified. The conclusion may be stated last, or first; it may sometimes be sandwiched between the premises offered in its support, as in the following passage:

> The real and original source of inspiration for the Muslim thinkers was the Quran and the sayings of the Holy Prophet. It is therefore clear that the Muslim philosophy was not a carbon copy of Greek thought, as it concerned itself primarily and specifically with those problems which originated from and had relevance to Muslims.¹¹

Here the conclusion, that “Muslim philosophy was not a carbon copy of Greek thought,” appears after the first premise of the argument and before the second.
The same proposition that serves as a conclusion in one argument may
serve as premise in a different argument, just as the same person may be a com-
mmander in one context and a subordinate in another. This is well illustrated by
a passage from the work of Thomas Aquinas. He argues:

Human law is framed for the multitude of human beings.
The majority of human beings are not perfect in virtue.
Therefore human laws do not forbid all vices. \(^{12}\)

The conclusion of this argument is used immediately thereafter as a premise
in another, quite different argument:

Vicious acts are contrary to acts of virtue.
But human law does not prohibit all vices. . . .
Therefore neither does it prescribe all acts of virtue. \(^{13}\)

No special techniques are needed, to grasp these arguments of St. Thomas. But
when the cascade of arguments is compressed, a paraphrase is helpful in
showing the flow of reasoning. Consider the following passage:

Because ① the greatest mitochondrial variations occurred in African people,
scientists concluded that ② they had the longest evolutionary history, indicat-
ing ③ a probable African origin for modern humans. \(^{14}\)

We might diagram the passage thus:

1. The more mitochondrial variation in a people, the longer its evolutionary
   history.
2. The greatest mitochondrial variations occur in African people.
Therefore African people have had the longest evolutionary history.

1. African people have had the longest evolutionary history.

2. Modern humans probably originated where people have had the longest evolutionary history.

Therefore modern humans probably originated in Africa.

These examples make it evident that the same proposition can serve as a premise, where it occurs as an assumption in an argument; or as a conclusion, where it is claimed to follow from other propositions assumed in an argument. “Premise” and “conclusion” are always relative terms.

Multiple arguments may be interwoven in patterns more complicated than cascades, and these will require careful analysis. The diagramming technique then becomes particularly useful. In John Locke’s Second Treatise of Government, for example, two arguments are combined in the following passage:

It is not necessary—no, nor so much as convenient—that the legislative should be always in being; but absolutely necessary that the executive power should, because there is not always need of new laws to be made, but always need of execution of the laws that are made.

The component propositions here may be numbered thus: ① It is not necessary or convenient that the legislative [branch of government] should be always in being; ② it is absolutely necessary that the executive power should be always in being; ③ there is not always need of new laws to be made; ④ there is always need of execution of the laws that are made. The diagram for this passage is

```
3 4
   |
1 2
```

which shows that the conclusion of the second argument is stated between the conclusion and the premise of the first argument, and that the premise of the first argument is stated between the conclusion and the premise of the second argument. The diagram also shows that both conclusions are stated before their premises.

That very same diagram shows the logical structure of two related arguments of the Roman philosopher Seneca, in support of the deterrence theory of punishment. He wrote:

① No one punishes because a sin has been committed, ② but in order that a sin will not be committed. [For] ③ what has passed cannot be recalled, but ④ what lies in the future may be prevented.
That “no one punishes because a sin has been committed” is the conclusion of one argument; its premise is that “what has passed cannot be recalled.” That “[we do punish] in order that a sin will not be committed” is the conclusion of a second argument, whose premise is that “what lies in the future may be prevented.”

Diagramming and paraphrasing are both very useful tools with which we can analyze arguments so as to understand more fully the relations of premises to conclusions.

EXERCISES

A. Diagram each of the following passages, which may contain more than one argument.

EXAMPLE

1. In a recent attack upon the evils of suburban sprawl, the authors argue as follows:

   The dominant characteristic of sprawl is that each component of a community—housing, shopping centers, office parks, and civic institutions—is segregated, physically separated from the others, causing the residents of suburbia to spend an inordinate amount of time and money moving from one place to the next. And since nearly everyone drives alone, even a sparsely populated area can generate the traffic of a much larger traditional town.\(^\text{15}\)

SOLUTION

\(1\) The dominant characteristic of sprawl is that each component of a community—housing, shopping centers, office parks, and civic institutions—is segregated, physically separated from the others, causing \(2\) the residents of suburbia to spend an inordinate amount of time and money moving from one place to the next. And since \(3\) nearly everyone drives alone, \(4\) even a sparsely populated area can generate the traffic of a much larger traditional town.
2. At any cost we must have filters on our Ypsilanti Township library computers. Pornography is a scourge on society at every level. Our public library must not be used to channel this filth to the people of the area.

—Rob. J. and Joan D. Pelkey,
*The Ann Arbor (Michigan) News*, 3 February 2004

3. At his best, Lyndon Johnson was one of the greatest of all American presidents. He did more for racial justice than any president since Abraham Lincoln. He built more social protections than anyone since Franklin Roosevelt. He was probably the greatest legislative politician in American history. He was also one of the most ambitious idealists. Johnson sought power to use it to accomplish great things.

—Alan Brinkley, “The Making of a War President,”

4. Married people are healthier and more economically stable than single people, and children of married people do better on a variety of indicators. Marriage is thus a socially responsible act. There ought to be some way of spreading the principle of support for marriage throughout the tax code.

—Anya Bernstein, “Marriage, Fairness and Taxes,”

5. The distinguished economist J. K. Galbraith long fought to expose and improve a society exhibiting “private opulence and public squalor.” In his classic work, *The Affluent Society* (Boston: Houghton Mifflin, 1960), he argued as follows:

> Vacuum cleaners to insure clean houses are praiseworthy and essential in our standard of living. Street cleaners to insure clean streets are an unfortunate expense. Partly as a result, our houses are generally clean and our streets generally filthy.

6. Defending the adoption of the euro in place of the pound as the monetary unit of the United Kingdom, Prime Minister Tony Blair said this: “The argument is simple. We are part of Europe. It affects us directly and deeply. Therefore we should exercise leadership in order to change Europe in the direction we want.”

—Reported by Alan Cowell in the *The New York Times*, 9 December 2001

7. California’s “three strikes and you’re out” law was enacted 10 years ago this month (March, 2004). Between 1994 and 2002, California’s
prison population grew by 34,724, while that of New York, a state without a “three strikes” law, grew by 315. Yet during that time period New York’s violent crime rate dropped 20 percent more than California’s. No better example exists of how the drop in crime cannot be attributed to draconian laws with catchy names.


8. No one means all he says, and yet very few say all they mean, for words are slippery and thought is viscous.

—Henry Adams, The Education of Henry Adams (1907)

9. The first impression becomes a self-fulfilling prophesy: we hear what we expect to hear. The interview is hopelessly biased in favor of the nice.


10. No government can ever guarantee that the small investor has an equal chance of winning. It is beyond dishonest to pretend that rules can be written to prevent future financial scandals. No set of regulations can insure fairness and transparency in the [securities] markets.


B. There may be one argument or more than one argument in each of the following passages. Paraphrase the premises and conclusions (or use diagrams if that is helpful) to analyze the arguments found in each passage.

**EXAMPLE**

1. An outstanding advantage of nuclear over fossil fuel energy is how easy it is to deal with the waste it produces. Burning fossil fuels produces 27,000 million tons of carbon dioxide yearly, enough to make, if solidified, a mountain nearly one mile high with a base twelve miles in circumference. The same quantity of energy produced from nuclear fission reactions would generate two million times less waste, and it would occupy a sixteen-meter cube. All of the high level waste produced in a year from a nuclear power station would occupy a space about a cubic meter in size and would fit safely in a concrete pit.

2.2 Diagramming Arguments

**SOLUTION**

1. An outstanding advantage of nuclear over fossil fuel energy is how easy it is to deal with the waste it produces. 2. Burning fossil fuels produces 27,000 million tons of carbon dioxide yearly, enough to make, if solidified, a mountain nearly one mile high with a base twelve miles in circumference. 3. The same quantity of energy produced from nuclear fission reactions would generate two million times less waste, and it would occupy a sixteen-meter cube. 4. All of the high level waste produced in a year from a nuclear power station would occupy a space about a cubic meter in size and would fit safely in a concrete pit.

![Diagram](image)

2. Why decry the wealth gap? First, inequality is correlated with political instability. Second, inequality is correlated with violent crime. Third, economic inequality is correlated with reduced life expectancy. A fourth reason? Simple justice. There is no moral justification for chief executives being paid hundreds of times more than ordinary employees.


3. Genes and proteins are discovered, not invented. Inventions are patentable, discoveries are not. Thus, protein patents are intrinsically flawed.


4. Ultimately, whaling’s demise in Japan may have little to do with how majestic, smart, or endangered the mammals are, but a good deal to do with simple economics. A Japanese newspaper conducted a survey in Japan regarding the consumption of whale meat, and reported that of all the thousands of respondents, only 4 percent said that they actually ate whale meat at least sometimes. The newspaper then wrote this: “A growing number of Japanese don’t want to eat whale meat. And if they won’t eat it, they won’t buy it. And if they won’t buy it, say goodbye to Japanese whaling.”

—Reported in *Asahi Shimbun*, April 2002
5. On the 18th of July, 2002, the Consejo Juvenil Sionista Argentino (Young Zionists of Argentina) held a mass demonstration to promote widespread remembrance of the horror of the bombing of the Jewish Community Center in Buenos Aires, exactly eight years earlier. At this demonstration the Young Zionists carried a huge banner, which read: “Sin memoria, no hay justicia. Sin justicia, no hay futuro.”

6. Back in 1884, Democratic nominee Grover Cleveland was confronted by the charge that he had fathered an out-of-wedlock child. While Republicans chanted, “Ma, Ma, where’s my Pa,” Cleveland conceded that he had been supporting the child. No excuses, no evasions. One of his supporters—one of the first spin doctors—gave this advice to voters:

Since Grover Cleveland has a terrific public record, but a blemished private life, and since his opponent, James G. Blaine, has a storybook private life but a checkered public record, why not put both where they perform best—return Blaine to private life, keep Cleveland in public life.

7. “Wars don’t solve problems; it creates them,” said an Oct. 8 letter about Iraq.

World War II solved problems called Nazi Germany and militaristic Japan, and created alliances with the nations we crushed. The Revolutionary War solved the problem of taxation without representation, and created the United States of America. The Persian Gulf War solved the problem of the Iraqi invasion of Kuwait. The Civil War solved the problem of slavery.

These wars created a better world. War is the only way to defeat evil enemies with whom there is no reasoning. It’s either us or them. What creates true peace is victory.


8. In the Crito, Plato presents the position of the Athenian community, personified as “the Laws,” speaking to Socrates or to any citizen of the community who may contemplate deliberate disobedience to the state:

He who disobeys us is, as we maintain, thrice wrong; first, because in disobeying us he is disobeying his parents; secondly, because we are the authors of his education; thirdly, because he has made an agreement with us that he will duly obey our commands.

9. The reality is that money talks. Court officers, judges and juries treat private lawyers and their clients differently from those who cannot pay for representation. Just as better-dressed diners get prime tables
at a restaurant, human nature dictates better results for those who appear to have money.

—Desiree Buenzle, “Free Counsel and Fairness,”

10. The town of Kennesaw, GA passed a mandatory gun ownership law, in 1982, in response to a handgun ban passed in Morton Grove, IL. Kennesaw’s crime rate dropped sharply, while Morton Grove’s did not. Criminals, unsurprisingly, would rather break into a house where they aren’t at risk of being shot . . . Criminals are likely to suspect that towns with laws like these on the books will be unsympathetic to malefactors in general, and to conclude that they will do better elsewhere. To the extent that’s true, we’re likely to see other communities adopting similar laws so that criminals won’t see them as attractive alternatives.

—Glenn Reynolds, “A Rifle in Every Pot,”

2.3 Complex Argumentative Passages

Some arguments are exceedingly complicated. Analyzing passages in which several arguments are interwoven, with some propositions serving as both premises and subconclusions while other propositions serve only as premises, and still others are repeated in different words, can be a challenge. The diagramming technique is certainly helpful, but there is no mechanical way to determine whether the diagram actually does represent the author’s intent accurately. More than one plausible interpretation may be offered, and in that case more than one diagram can reasonably be used to show the logical structure of that passage.

To analyze fairly, we must strive to understand the flow of the author’s reasoning, and to identify the role of each element in the passage as part of that flow. The examples that follow (in which component propositions have been numbered for purposes of analysis) show the ways in which we can set forth the connections between premises and conclusions. Only after that is done, when we have identified the arguments within a passage and the relations of those arguments, can we go about deciding whether the conclusions do indeed follow from the premises affirmed.

In the following set of arguments, the final conclusion of the passage appears in the very first statement, which is not unusual. Four premises directly support this conclusion; two of these are subconclusions, which in turn are supported, in different ways, by other premises affirmed in the passage:

1. It is very unlikely that research using animals will be unnecessary or poorly done.
2. Before an experiment using a vertebrate animal is carried out, the protocol