CHAPTER

10

The Role of Criticism

In the first chapter of this book, you learned that there are two phases to thinking: the *creative* phase, in which ideas are produced, and the *critical* phase, in which they are evaluated. Since then we have discussed the creative phase in detail. Now we turn our attention to the critical phase.

This chapter explains why critical thinking is necessary and gives you an overview of how critical thinking strategies are applied to problems and issues.

G. K. Chesterton once described a poet as a person with his head in the clouds and his feet on the ground. That description also fits good thinkers. They are able to entertain the boldest ideas, the undreamed-of solutions to problems—yet they are also able to fit their ideas to the exacting demands of reality. They are not only imaginative but practical as well. We have examined the former, creative phase of thinking. Now we will examine the latter, critical phase.

Critical thinking, as we define it here, means reviewing the ideas we have produced, making a tentative decision about what action will best solve the problem or what belief about the issue is most reasonable, and then evaluating and refining that solution or belief.

WHY CRITICISM IS NECESSARY

The role of criticism in problem solving is important for two reasons. First, no solution is ever perfect. However creative it may be, there is always room for improvement. Even the best ideas seldom occur in refined form. Like fine gems, they must be cleaned and polished before their potential worth is realized. Second, in many cases solutions cannot just be put into effect; they must first be

approved by others. Ideas for the improvement of the office or factory, for example, may require the approval of an employer or supervisor. Ideas about overcoming difficulties in family relationships may depend on the cooperation of other family members. And creative solutions to social problems often require the support of government leaders or the endorsement of the voters. In such cases, the best idea in the world is of little value until others are persuaded of its worth.

Criticism is equally important in resolving issues. A viewpoint may seem eminently reasonable, the ideal ground for compromise between opposing views, yet contain subtle flaws. Sometimes these become evident only when the idea is translated into a course of action.

In the early 1970s, for example, in response to the issue of fairness in divorce settlements, the idea of "no-fault" divorce became law in California, and in subsequent years, in most other states. It was considered at the time an ingenious way to permit a marriage to be dissolved easily and fairly, without squabbling and bitter accusations. Later, many critics identified an effect of no-fault divorce that no one anticipated when it was instituted: the impoverishment of divorced women and their children.[1]

Although there can never be a guarantee that even the most thorough criticism will reveal every flaw in an idea, your responses to issues are more likely to be reasonable if you subject your ideas to rigorous evaluation before reaching a judgment. Critical thinking reduces your chance of error.

FOCUS ON *YOUR* IDEAS

The focus of this and the following chapters is not on criticism of other people's solutions. It is rather on a much more difficult, even painful, criticism: that of *your own* solutions. Like everyone else, you are vulnerable to a variety of errors. You may receive inaccurate reports from others, including the media. In addition, you may misunderstand accurate reports, fall prey to rumor and hearsay, let emotion color your judgment, and suffer lapses in logic. For these reasons, the ideas you produce need criticism.

Ironically, though you are undoubtedly ready to criticize others' ideas freely, like most people you are probably blind to the need for criticism of your own thinking. There are at least two reasons for this. First, your ego is inclined against self-criticism. Once you have settled on an idea, you feel a proprietary interest in it. "It is mine," you tell yourself, "so it must be good." And once in that frame of mind, you are ready to defend the idea against all attack, even the attack that your own good judgment might mount against it. The situation is something like that of a dog with a bone. The dog will cling to it tenaciously and growl and snarl when anyone approaches, not because the bone is worth anything (it may long since have been chewed out), but simply because it is the dog's possession.

Another reason you will be reluctant to evaluate your own ideas is that their familiarity makes it difficult to see flaws in them. The longer you work on a problem or an issue, the more accustomed you become to its details. And once your effort yields a solution, you may be so enamored of it that you have difficulty seeing it objectively.

OVERCOMING OBSTACLES TO CRITICAL THINKING

This blindness toward imperfections in your ideas will make it tempting to approach criticism of your ideas with, at best, mock analysis followed by a vigorous nod of approval. There are two ways you can safeguard against this mistake. The first is to say to yourself, before you begin to take a critical look at any idea, "I know this idea is going to look good to me and that I am going to feel it's pointless to look for flaws. That's natural. I thought of it, so I want it to be perfect. *But I'm going to disregard this reaction and force myself to examine it critically.*"

The second safeguard is to use your ego to advantage. Whenever you find yourself ready to stop evaluating your idea before you really should, reflect for a moment on how it would feel to have a serious flaw pointed out by someone else, particularly by someone you don't much care for. Visualize the situation; imagine yourself squirming with embarrassment and awkwardly offering face-saving excuses. Such a mental picture ought to motivate you to continue evaluating your idea.

APPLYING CURIOSITY

We have seen how curiosity increases awareness of problems and issues, enabling you to feel dissatisfactions and annoyances more consciously and to regard them more productively as challenges and opportunities. We have seen, too, that curiosity keeps your mind dynamic and contributes to the playfulness Einstein regarded as "the essential feature of productive thought." That same curiosity is also a valuable aid to critical thinking.

Perhaps you've had the experience of adding up a column of figures and getting the same answer—the *wrong* answer—again and again. Psychologists have long recognized that when we travel a particular mental route a second or third time, we often follow our earlier footsteps without realizing that we are doing so. That's what happened when you added up those figures. You had the impression that each new total was fresh and independent. In reality, though, you were trapped by your initial miscalculation.

That same kind of mistake can occur when you examine your ideas critically. You can look at an idea again and again and still not see its flaws. To be effective, you need to examine the idea from different perspectives. That's where curiosity comes in. By approaching criticism inquisitively—asking "How will my idea work when it is applied?" and "How will others react to it?"—you will increase your chances of finding the imperfections and complications that need to be addressed.

AVOIDING ASSUMPTIONS

To assume is to take something for granted, to expect that things will be a certain way because they have been that way in the past or because you want them to be that way. It's natural to make assumptions. Everyone makes them continually.

You assume, for example, that your professor will be in class when class is scheduled, that the cafeteria will not serve lunch two hours early, that your car is safe from vandalism in the college parking lot, that the bank that has always cashed your checks will continue to do so, and that the elevator is really going up when the indicator says it is. Making such assumptions is reasonable, even if on occasion they prove to be incorrect.

Nevertheless, it is important to be careful about what you assume. And when you are evaluating and refining your ideas, you should make a special effort to identify assumptions you may not have detected previously. The reason is not only that unexpected outcomes can cause you embarrassment but also, and more importantly, that *what you take for granted you will not examine critically.* Assumptions obstruct the evaluation process.

It would be impossible to list all the assumptions it is possible to make. However, the following assumptions occur often enough, and interfere with critical thinking seriously enough, to warrant special mention.

1. *The assumption that others familiar with the problem or issue will share your enthusiasm for your ideas.* Although this might seem to be a reasonable expectation, it seldom is. The more familiar people are with a problem or issue, the more likely they are to have their own ideas.

2. *The assumption that small imperfections in your idea will not affect people's acceptance of it.* When other people's ideas differ from yours, they are likely to magnify flaws in your ideas without even realizing it because, subconsciously, they are looking for an excuse to reject your ideas. Small imperfections may provide that excuse.

3. *The assumption that if your idea is clear to you, it will be clear to others.* If you've ever sat in a classroom and heard a teacher offer an explanation that didn't make the slightest sense to you, you should appreciate the confusion this assumption can cause. *Your* understanding of what you are expressing does not constitute clarity. If you want the solution and its presentation to be clear, you must *construct* it to be so and not just assume that it is.

4. *The assumption that the people who stand to benefit most from your idea will accept it automatically without any persuasion on your part.* This assumption has caused creative people incalculable grief. For example, when Elias Howe invented the sewing machine, he knew it would be a boon to the garment industry by revolutionizing garment construction and making the clothing business much more profitable. He may very well have assumed that the mere unveiling of his invention would be sufficient to have the leaders of that industry praise it and him. But reality didn't match that assumption. Howe couldn't get a single American firm interested enough to buy the machine. He was forced to go to England to find a favorable reception. To spare yourself disappointment, never assume that the value of your ideas will be universally recognized. Expect to have to persuade other people.

REFINING YOUR SOLUTIONS TO PROBLEMS

Refining your solutions means making good ideas even better—that is, making the results of your creative thinking more effective, more workable, more attractive. Although much of what you will be doing in this stage is finding flaws and complications, the emphasis is not negative but positive. Your aim is to *improve* your ideas.

Not every idea, of course, requires refinement. With the problem of the string that slips out of your sweatpants, for example, there is little or no need for refinement and no need to present the solution for others' approval. Once you have decided on a solution, you can just implement it. Most of the important problems and issues you will encounter, however, are more demanding.

Later chapters will develop the refinement and presentation of ideas more fully. The basic approach that follows will enable you to begin using these steps and developing skill in applying them even while you are studying each in greater depth. The approach consists of asking and answering these four questions.

1. How exactly will your solution be applied? List all steps and all important details.
2. What difficulties could arise in its implementation, and how would these best be overcome?
3. What reasons might others find for opposing this solution? What modifications could you make to overcome their opposition?
4. Who, specifically, will have to be persuaded of the merit of your solution? What kind of presentation would be most likely to persuade them?

A SAMPLE PROBLEM

The following problem was included in Chapter 9's applications.

> You are the editor of the college newspaper. Your staff consists of two other people who limit their work to a few hours a week. To get the paper out each week, you've had to spend many more hours than your course load permits. On several occasions, you've stayed up all night and slept through the next morning's classes. You've tried putting ads in the paper to get more staff members, but no one answers them.

Let's say you identified the problem as "How to reward students for joining the staff." (This is one good expression of the problem, though not, of course, the only one.) Let's say further that after investigating the problem and producing a number of possible solutions, you chose *giving some form of college credit*

CHAPTER

11

Refine Your Solution to the Problem

This chapter takes a closer look at the application of critical thinking in *solving problems.* (Issues are treated in Chapter 12.) In this chapter you will learn how to work out the details of your solution, how to find imperfections and complications, and how to improve the solution so that it can withstand other people's criticism.

How might the human voice be carried over distances beyond the normal range of hearing? That was the problem facing Alexander Graham Bell. The solution, as we all know, was the telephone. But how did Bell actually invent it? Most of us probably have the vague notion that once he got his creative idea, he merely retired to his workshop, built a model of the machine, sold it, and became rich and famous. In fact, it wasn't that simple. Although Bell was an expert in sound, he knew virtually nothing about electricity. Before he was able to make his idea a reality, he had to learn all about electricity and then put his knowledge to work and solve the technical problems.

The refinement of solutions to problems does not always demand learning an entirely new field, but it is seldom the easy matter many people assume. As Eliot Hutchinson explains:

> There is nothing trifling, incidental or dilettantish about this business of [refining solutions]. It is work, days and nights of it, months and years of it, the perspiration that is nine-tenths genius. And it tires, discourages, exhausts . . . . The history both of art and of science is largely the history of man's personal endurance, his acceptance of labor as the price of success. To be sure, some men dash off a brilliant piece of work, spread themselves for a time. But 90 percent of reputable authors, no matter how sure their technique, and well-nigh all reputable scientists

revamp their work until what was given in insight is so overlaid with secondary material that it is hardly to be recognized. Elaboration is for the mature only; it is for the rigorous, the exacting, the profound.[1]

THREE STEPS IN REFINING

Because refinement can spell the difference between success and failure, you should approach it very seriously. Yet there is no reason to be frightened by the task. It usually requires no special gift or talent. Rather, it is achievable by anyone who is willing to work hard and patiently. Three steps are involved: working out the details of the solution, finding imperfections and complications, and making improvements.

Step 1: Working Out the Details

The first step means determining exactly how your solution will be applied. It's easy to overlook this step or to ignore its significance. After all, most of the things we use every day and take for granted—the concepts, the processes and systems, the products and services—appear to us in refined form. We seldom have occasion even to imagine how they appeared in rough form or to appreciate the difficult challenges their refinement posed for their creators.

Consider the ballpoint pen. It was first conceived of in the United States in 1888 by John Loud. He even obtained a patent for his idea of using a rotating ball to deliver the ink to the paper. Yet he never was able to refine the pen enough to make it write cleanly. In 1919, Laszlo Biro of Hungary reinvented this pen, but he was unable to complete his design and market his idea until 1943—and even then the ink came out in splotches. Finally, Franz Seech of Austria worked out the basic difficulties in 1949 (the key to his pen's performance was fast-drying ink) and marketed his pen successfully. Thus, *61 years* elapsed from conception to refinement.[2]

When William Addis, a prisoner in a British jail, got the idea for the first toothbrush in 1870, he faced a number of challenges to his ingenuity. (In case you didn't know, before 1870 people cleaned their teeth by rubbing them with a rag.) What would be the right size for the invention? What shape would be best? What should it be made of? What kind of bristles would work best? How should they be held together? What could be used to contain the bristles? Addis saved a bone from his supper; bored tiny holes in it; obtained some bristles from his prison guard; cut, tied, and glued them together; and inserted them into the bone. When he was released from prison, he marketed his invention and became a business success.[3]

The refinement of the typewriter posed even greater challenges. How to place the keys, how to arrange the keyboard, how to make the keys strike, how to hold the paper, how to make the carriage move so that the keys wouldn't strike the same place over and over, how to move from line to line without turning the carriage by hand, how to ink the keys—these were just some of the details that had to be worked out. In light of such numerous and complex

problems, it is perhaps not surprising that before Christopher Sholes and Samuel Soulé completed their first working model in 1867, *51 other inventors* had tried and failed.[4]

We could cite many other examples of the refinement difficulties facing the originators of most new ideas. The point is that even the most creative idea does not become useful until the details of its application are worked out. The following approach will help you work out the details of your solutions more effectively:

If your solution involves *doing* something (as, for example, in a new process), answer these questions.

- How exactly is it to be done, step-by-step?
- By whom is it to be done?
- When is it to be done? (According to what timetable?)
- Where is it to be done?
- Who will finance it?
- What tools or materials, if any, are to be used?
- From what source will they be obtained?
- How and by whom will they be transported?
- Where will they be stored?
- What special conditions, if any, will be required for the solution to be carried out?

If your solution involves *making* something (as in a new product), answer these questions.

- How will it work? Explain thoroughly.
- What will it look like? Be specific as to size, shape, color, texture, and any other relevant descriptive details.
- What material will it be made of?
- What will the product cost to make?
- Who will pay for it?
- How exactly will it be used?
- Who will use it? When? Where?
- How will it be packaged?
- How will it be delivered?
- How will it be stored?

Step 2: Finding Imperfections and Complications

After you have worked out the details of your solution, your next step is to examine those details for imperfections. Remember that despite the normal tendency to regard your solution as perfect and to view this step as unnecessary, it is almost certain that your solution, like any other, contains at least minor flaws. Remember, too, that your success in persuading others of your solution's value will depend in no small part on your willingness to improve your idea in any way you can.

Until you are experienced in examining solutions critically, the biggest difficulty you are likely to encounter is knowing what kinds of imperfections and complications to look for and how to go about looking for them. The following four approaches will prove helpful both in overcoming that initial difficulty and in ensuring that your analysis will be comprehensive.

1. *Check for common kinds of imperfections.* The following areas are the ones in which imperfections most commonly occur. (Not every one, of course, will apply to every type of solution.) Although the list is not exhaustive, and therefore you should not limit yourself to it, it is an excellent starting point for examining most solutions.

   - *Clarity:* Is the solution difficult to understand?
   - *Safety:* Does the solution create any danger for those who use it or those for whom it is used?
   - *Convenience:* Is the solution awkward to use or implement?
   - *Efficiency:* Does using the solution involve significant delays?
   - *Economy:* Is the solution too costly to build or implement?
   - *Simplicity:* Is the solution unnecessarily complex in design or format?
   - *Comfort:* Is the solution uncomfortable to use?
   - *Durability:* Is the solution likely to break or malfunction?
   - *Aesthetics:* Will most people find the solution ugly or unappealing?
   - *Compatibility:* Does the solution clash with any other product or process it should harmonize with?

2. *Compare the solution with competing ones.* Examine the existing product or process your solution is designed to replace, or study another proposed solution competitive with yours. Determine how the existing product, process, or competing solution is superior to yours. (Although your solution should be superior in most major respects, it may be inferior in one or two minor respects. Any such area should be considered an imperfection.)

3. *Consider what changes your solution will cause.* Ask yourself what will occur if your solution is implemented. Don't overlook even minor changes. Decide which of them, if any, will cause complications.

4. *Consider the effects your solution will have on people.* Look among the physical, moral, emotional, intellectual, and financial areas of life to see how any would be affected. Be sure to consider even the remote effects that might occur on any person or group. Most of the changes you list will undoubtedly be beneficial. But those that are in any way undesirable will often signal imperfections or complications in your solution.

Step 3: Making Improvements

The third and final step in refining your solution is to make improvements that will eliminate imperfections. Here, classified according to the types of solutions they are usually associated with, are the kinds of improvements you will find applicable in most situations.

For a new or revised concept:

- Change the terminology—make it simpler, easier to remember, more eye-catching.
- Change the way it is explained—use different illustrations, analogies, and so on.
- Change the application—use it in different situations or in different ways.

For a new or revised process, system, *or* service:

- Change the way it is done, the step-by-step approach.
- Change who does it.
- Change the place where it is done.
- Change the tools or materials used.
- Change the source from which the tools or materials are obtained.
- Change the place the tools or materials will be stored.
- Change the conditions required.

For a new or modified product:

- Change its size, shape, color, texture, and so on.
- Change its composition (the material it is made of).
- Change the way it is used.
- Change who will use it or when or where it will be used.
- Change the way it is packaged or delivered.
- Change the way it is stored.

Whenever you address an imperfection and are trying to think of ways to improve your solution, be sure to consider using the approaches for producing ideas explained in Chapter 9. Specifically, you should consider *forcing uncommon responses, using free association and analogy, looking for unusual combinations,* and *visualizing the possibilities.* Each imperfection and complication is, after all, a mini-problem in itself and will therefore respond to the creative process much as the larger problem did.

Most important, be sure not to settle for the first improvement that occurs to you. Instead, extend your effort to produce ideas, and withhold judgment of any one idea until you have produced a generous number of possibilities.

Occasionally, you will encounter an imperfection that requires you to return to the second stage of the creative process and investigate the matter more deeply—much as Alexander Graham Bell did when he took time out to master the principles of electricity. In extreme cases, you may even find that your solution is too badly flawed to be workable. At such times, you will feel as if all your efforts were wasted. But they will not really have been wasted. *To find out what does not work is an important step toward determining what does.*

TWO SAMPLE PROBLEMS

The First Problem

Now let's apply this approach to some cases and note how it works. The first case concerns Rocco, the manager of the movie theater. His problem was discussed in Application 7.4: "In recent years, a number of competitors have cut

CHAPTER

12

Evaluate Your Argument on the Issue

In this chapter you will learn how to identify and overcome errors in reasoning. This is a special step that applies only to issues because resolving issues involves finding the most *reasonable* belief.

Two broad kinds of errors are examined—errors affecting the truth of your ideas and errors affecting the quality of your reasoning. A step-by-step approach to evaluate arguments is also included.

Because your main objective in addressing an issue is not to find the most effective action but to determine the most reasonable belief, your main task in refining an issue is to evaluate your argument to be sure that it is free of error. Two broad kinds of error must be considered. The first affects the *truth* of the argument's premises or assertions. The second affects the argument's *validity*—that is, the legitimacy of the reasoning by which the conclusion was reached. A sound argument is both true and valid.

ERRORS AFFECTING TRUTH

Errors affecting truth are found by testing the accuracy of the premises and the conclusion as individual statements. The first and most common error in this category is simple factual inaccuracy. If we have investigated the issue properly and have taken care to verify our evidence whenever possible, such errors should not be present. We will therefore limit our consideration to the more subtle and common errors:

- Either/or thinking
- Avoiding the issue
- Overgeneralizing
- Oversimplifying

- Double standard
- Shifting the burden of proof
- Irrational appeal

Either/Or Thinking

This error consists of believing that only two choices are possible in situations in which there are actually more than two choices. A common example of either/or thinking occurs in the creationism-versus-evolution debate. Both sides are often guilty of the error. "The biblical story of creation and scientific evolution cannot both be right," they say. "It must be either one or the other." They are mistaken. There is a third possibility: that there is a God who created everything but did so through evolution. Whether this position is the best one may, of course, be disputed. But it is an error to ignore its existence.

Either/or thinking undoubtedly occurs because, in controversy, the spotlight is usually on the most obvious positions, those most clearly in conflict. Any other position, especially a subtle one, is ignored. Such thinking is best overcome by conscientiously searching out all possible views before choosing one. If you find either/or thinking in your position on an issue, ask yourself, "Why must it be one view or the other? Why not both or neither?"

Avoiding the Issue

The attorney was just beginning to try the case in court when her associate learned that their key witness had changed his mind about testifying. The associate handed the attorney this note: "Have no case. Abuse the other side." That is the form avoiding the issue often takes: deliberately attacking the person with the opposing view in the hope that the issue itself will be forgotten. It happens with lamentable frequency in politics. The issue being debated may be, for example, a particular proposal for tax reform. One candidate will say, "The reason my opponent supports this proposal is clear: it is a popular position to take. His record is filled with examples of jumping on the bandwagon to gain voter approval." And so on. Of course, what the candidate says may be true of the opponent, and if it is, then it would surely be relevant to the issue of whether the opponent deserves to be elected. But it is not relevant to the issue at hand, the tax reform proposal.

Avoiding the issue may not necessarily be motivated by deceit, as the preceding examples are. It may occur because of unintentional misunderstanding or because of an unconscious slip to something irrelevant. But it is still error, regardless of its innocence. To check your reasoning, look closely at each issue, and ask whether your solution really responds to it. If it doesn't, make it do so.

Overgeneralizing

Overgeneralizing means taking a valid idea and extending it beyond the limits of reasonableness. Here are some examples.

- Women who have abortions are poor and unmarried.
- Politicians are corrupt.

- Conservative Christians are intolerant.
- Men have trouble expressing their feelings.

Each of these statements could be true at times. That is, we could find examples of poor, unmarried women who have had abortions; corrupt politicians; and so on. Yet, in each case, we could also find examples that do not fit the assertion. That is what makes these statements overgeneralizations. (The fact that your overgeneralizations do not take the most extreme form—stereotypes, which we discussed in Chapter 3—should not make you complacent about correcting them. They still mar your arguments, usually significantly.)

To find overgeneralizations in your arguments, be alert to any idea in which *all* or *none* is stated or *implied*. (That is the case in each of the preceding four examples.) Occasionally, you will find a situation in which *all* or *none* is justified, but in the great majority of cases, critical evaluation will show that it is not. To correct overgeneralizations, decide what level of generalization is appropriate, and modify your statement accordingly. For example, in the four cases discussed, you would consider these possibilities:

Some Many Most All A specific number of	. . . women who have abortions are poor and unmarried.
Some Many Most All Certain types of	. . . politicians are corrupt.
Some Many Most All In certain cultural conditions	. . . conservative Christians are intolerant.
Some Many Most All In certain cultural conditions	. . . men are incapable of expressing their feelings.

Oversimplifying

There is nothing wrong with simplifying a complex reality to understand it better or to communicate it more clearly to others. Teachers simplify all the time, especially in grade school. Simplification is only a problem when it goes too

far: when it goes beyond making complex matters clear and begins to distort them. At that point, it ceases to represent reality and misrepresents it. Such oversimplification is often found in reasoning about causes and effects. Here are three examples of this error.

- The cause of voter dissatisfaction in the 2010 election was high unemployment.
- The American Nazi Party has a beneficial effect on the intellectual life of the country. It reminds people of the constitutional rights of free speech and assembly.
- A return to public executions, shown on prime-time television, would make crime less glamorous and thus, in time, make us a less brutal, more civilized society.

These statements contain an element of truth. Yet they do not fairly or accurately represent the reality described. They focus on one cause or effect as if it were the only one. In fact, there are others, some of them significant.

To find oversimplifications in your arguments, ask what important aspects of the issue your statements ignore. To correct oversimplifications, decide what expression of the matter best reflects the reality without distorting it.

Double Standard

Applying a double standard means judging the same action or point of view differently depending on who performs the action or holds the point of view. It can often be recognized by the use of sharply contrasting terms of description or classification. Thus we may attack a government assistance program as a welfare handout if the money goes to people we don't know or don't identify with but defend it as a necessary subsidy if it goes to our friends. Similarly, if one country crosses another's border with a military force, we may approve the action as a "securing of borders" or condemn it as "naked aggression," depending on our feelings toward the countries involved.

Be careful not to confuse the double standard with the legitimate judgment of cases according to their circumstances. It is never an error to acknowledge real differences. Accordingly, if you find you have judged a particular case differently from other cases of the same kind, look closely at the circumstances. If they warrant different judgments, you have not been guilty of applying a double standard. However, if they do not warrant different judgments—if your reasoning shows partiality toward one side—you have committed the error and should revise your judgment to make it fair.

Shifting the Burden of Proof

This error consists of making an assertion and then demanding that the opposition prove it false. This is an unreasonable demand. The person making the assertion has the burden of supporting it. Though the opposing side may accept the challenge of disproving it, it has no obligation to do so. Suppose, for example, you said to a friend, "There was widespread voter fraud in the last election," your friend disputed you, and you responded, "Unless you can disprove my claim, I am justified in believing it." You have shifted the burden of proof.

Having made the assertion about voter fraud, you have the obligation to support it. To overcome this error in your arguments, identify all the assertions you have made but not supported, and provide adequate support for them. If you find you cannot support an assertion, withdraw it.

Irrational Appeal

This error bases your position on an unreasonable appeal. The most common forms are the appeal to *common practice* ("Everyone does it"), the appeal to *tradition* ("We mustn't change what is long established"), the appeal to *fear* ("Awful things could happen"), the appeal to *moderation* ("Let's not offend anyone"), and the appeal to *authority* ("We have no business questioning the experts"). Of course, there is nothing necessarily wrong with defending common practice or tradition, warning about dangers, urging moderation, or supporting the views of experts. It is only when these appeals are used as *a substitute* for careful reasoning—when they aim at an audience's emotions rather than their minds—that they are misused. To correct irrational appeals, refocus your argument on the specific merits of your ideas.

ERRORS AFFECTING VALIDITY

Errors affecting validity do not occur within any individual premise or within the conclusion. They occur instead in the reasoning by which the conclusion is drawn from the premises. Therefore, to determine whether an argument is valid or invalid, we must examine the relationship between the premises and the conclusion. The logical principles governing validity are the substance of *formal logic*, the area of logic concerned with the various forms of argument. Since a detailed treatment of formal logic is beyond the scope of this book, we will focus on an essential error that commonly occurs in controversial issues: the *illegitimate conclusion*.

An illegitimate conclusion is one that does not follow logically from the premises preceding it. Before examining an illegitimate conclusion, let's first look at a *legitimate* one.

> Anything that shortens people's attention span harms their concentration. Television commercials shorten people's attention span. Therefore, television commercials harm people's concentration.

This conclusion is legitimate because if anything that shortens people's attention span harms concentration, and if television commercials do shorten that span, they therefore must harm people's concentration. Commercials, after all, are a thing, so they fit in the *anything* specified in the first premise. When we are checking for the validity of the reasoning, remember, we are not checking for the truth of the premises or conclusion. That concern is a separate matter. Thus even a ludicrous argument could be technically valid. Here is an example.

> Anything that gives people indigestion harms their concentration. Television commercials give people indigestion. Therefore, television commercials harm people's concentration.