Preface

We intend that, like the first edition of *The Craft of Research*, this second edition meet the needs of all researchers, not just beginners, or advanced graduate students, but even those in business and government who are assigned research on any topic, technological, political, or commercial. Our aim is to

- guide you through the complexities of organizing and drafting a report that poses a significant problem and offers a convincing solution;
- show you how to read your drafts as your readers might so that you can recognize passages they are likely to find unnecessarily difficult and then revise them effectively.

Other handbooks touch on these matters, but this one differs in many ways. Most current guides agree that researchers never move in a straight line from finding a topic to stating a thesis to filling in note cards to drafting and revision. Real research loops back and forth, moving forward a step or two, going back and moving ahead again, anticipating stages not yet begun. But so far as we know, no previous guide has tried to explain how each part of the process influences all the others—how asking questions about a topic prepares the researcher for drafting, how draft-

ing reveals problems in an argument, how writing an introduction can send you back to the library.

THE COMPLEXITIES OF THE TASK

Because research is so complex, we have tried to be explicit about it, including matters that are usually left implicit as part of a mysterious creative process, including these:

- how to turn a vague interest into a problem worth posing and solving;
- how to build an argument that motivates readers to accept your claim;
- how to anticipate the reservations of thoughtful but critical readers and then respond appropriately;
- how to create an introduction and conclusion that answer that toughest of questions, *So what?*;
- how to read your own writing as others may, and thereby learn when and how to revise it.

Central in every chapter is our advice to side with your readers, to imagine how they judge what you have written. Meeting their expectations is not, however, the only reward for mastering the formal elements of a research report. When you learn those formal matters, you are better able to plan, conduct, and evaluate the process that creates one. The elements of a report—its structure, style, and methods of proof—are not empty formulas for convincing readers to accept your claims. They help you test your work and discover new directions in it.

As you can guess, we believe that the skills of doing and reporting research are not just for the elite; they can be learned by all students. Though some aspects of advanced research can be learned only in the context of a specific community of researchers, the good news is that even if you don't yet belong to such a community, you can create something like it on your own. To

that end, in our "Postscript for Teachers," we show you (and your teachers) ways that a class can create such a community.

We should note what we do not address. We do not discuss how to incorporate narratives and "thick descriptions" into an argument. Nor have we examined how arguments incorporate recordings and other audio forms of evidence. Both are important issues, but too large for us to do justice to them here. There are also advanced techniques for Internet searches and other ways of gathering data that we do not have space to cover. Our bibliography suggests a number of sources for guidance in those areas.

ON THE SECOND EDITION

In revising the first edition, we have naturally been grateful to all those who praised it, but especially to those who used it. We hoped for a wide audience, but didn't expect it to be as wide as it turned out to be, ranging from first-year students in composition classes to advanced graduate students to advanced researchers (including more than a few tenured professors, if we can believe our e-mail). We are particularly thankful to all those users who shared their suggestions for improvement.

Because the reception of the first edition was so positive, we were at first uneasy about doing a second. We didn't want to lose whatever it was that readers of the first found useful. Yet we had learned some things in the last ten years, and we knew the book had places that could be improved. (Besides, the three of us always hope for the chance to do one more draft of everything we write.)

We have cleaned things up in every chapter, cut repetitions, and fixed sentences that were less than felicitous. We have expanded our comments on how computers have changed research. We have extensively revised the chapters on argument to explain a number of issues more clearly. We have also made a crucial distinction that we missed in the first edition—the difference between reasons and evidence. (How we let that one get by, we'll never know; it is small comfort that few if any other books on research arguments make that distinction either.) We have

modified what we said about *qualifications* and *rebuttals*, which we now call *acknowledgment* and *response*. We have also redone the chapter on the visual representation of data. Finally, we have rearranged the order of chapters a bit. Throughout, we have tried to preserve the tone, the voice, the sense of directness that so many of you thought was important in the first. We have revised to make things better, but sometimes revisions make them worse. We hope we have made them better.

A True Story

As we were preparing this second edition, Booth got a call from a former student who, as had all of his students, been directed again and again by Booth to revise his work. Now a professional in his mid-forties, he called to tell Booth about a dream he had had the night before: "You were standing before Saint Peter at the Pearly Gate, hoping for admission. He looked at you, hesitant and dubious, then finally said, 'Sorry, Booth, we need another draft.'"

OUR DEBTS

We want again to thank the many without whose help the first edition could never have been realized, especially Steve Biegel, Jane Andrew, and Donald Freeman. The chapter on the visual presentation of data was improved significantly by the comments of Joe Harmon and Mark Monmonier. We would also like to thank those who helped us select and edit the "Appendix on Finding Sources": Jane Block, Diane Carothers, Tina Chrzastowski, James Donato, Kristine Fowler, Clara Lopez, Bill McClellan, Nancy O'Brien, Kim Steele, David Stern, Ellen Sutton, and Leslie Troutman. We are also indebted to those at the University of Chicago Press who, when we agreed to undertake this project almost a decade ago, kept after us until we finally delivered.

For this second edition, we'd like to thank those whose thoughtful reviews of the first edition and our early revisions of it helped us see opportunities we would otherwise have missed: Don Brenneis, University of California, Santa Cruz; John Cox, Hope College; John Mark Hansen, University of Chicago; Richard Hellie, University of Chicago; Susannah Heschel, Dartmouth College; Myron Marty, Drake University; Robert Sampson, University of Chicago; Joshua Scodel, University of Chicago; W. Phillips Shively, University of Minnesota; and Tim Spears, Middlebury College.

We are also grateful to Alec MacDonald and Sam Cha for their invaluable help tracking down details of all sorts, and to Adam Jernigan for his careful reading of the manuscript. All three were quick and reliable.

We are again indebted to those at the University of Chicago Press who supported the writing of this revision.

From WCB: I am amazed as I think back on my more than fifty years of teaching and research by how many students and colleagues could be cited here as having diminished my ignorance. Since that list would be too long, I'll thank mainly my chief critic, my wife, Phyllis, for her many useful suggestions and careful editing. She and my daughters, Katherine Stevens and Alison Booth, and their children, Robin, Emily, and Aaron, along with all those colleagues, have helped me combat my occasional despair about the future of responsible inquiry.

From GGC: I, too, have been blessed with students and colleagues who have taught me much—first among them the hundreds of grad students who shared with me their learning to be teachers. They, above all, have shown me the possibilities in collaborative inquiry. What I lean on most, though, are home and family: Sandra, Robin, Karen, and Lauren. Through turbulent times and calm, they gave point and purpose to it all. Before them was another loving family, whose center, Mary, still sets an example to which I can only aspire.

From JMW: The family has grown since the first edition, and I am ever more grateful for their love and support: Ol, Chris, Dave and Patty, Megan and Phil, Joe and Christine, and now Lily and the twins, Nicholas and Katherine. And at beginning and end, Joan, whose patience, love, and good sense flow still more bountifully than I deserve.

PART I

Research, Researchers, and Readers

Prologue

STARTING A RESEARCH PROJECT

If you are beginning your first research project, the task may seem overwhelming. *How do I find a topic? Where do I find information on it? What do I do with it when I find it?* Even if you have written a research paper in a writing class, the idea of another may be even more intimidating if this time it's supposed to be *the real thing*. Even experienced researchers feel anxious when they tackle a new project, especially when it's of a new kind. So whatever anxiety you may feel, most researchers have felt the same. (It's a feeling that we three know well.) The difference is that experienced researchers know what lies ahead—hard work, but also the pleasure of the hunt; some frustration, but more satisfaction; periods of confusion, but confidence that, in the end, it will all come together.

MAKING PLANS

Experienced researchers also know that research most often comes together when they have a plan, no matter how rough. Before they start, they may not know exactly what they are looking for, but they know in general what they will need, how to find it, and what it should look like when they do. And once they assemble their materials, they don't just start writing, any more than competent builders just start sawing; they make a plan—maybe no more than a sketch of an outline, not even on paper.

But shrewd researchers don't let their plan box them in. They change it if they run into a problem or discover in some byway something more interesting that leads in a new direction. But they do start with a plan.

A newspaper reporter, for example, follows a plan when she writes her story as an inverted pyramid, putting the salient information first. But she doesn't do that just for her own benefit, to make her job of drafting easier, but so that *readers* can find the gist of the news quickly, then decide whether to read on. An accountant knows how to plan an audit report, but that plan also lets investors quickly find the information they need to decide whether the company is an Intel or another Enron. Within these forms, of course, writers are free to take different points of view, emphasize different ideas, and put a personal stamp on their work. But they also know that when they follow a standard plan, they make it easier for themselves to write and their readers to read efficiently and productively.

The aim of this book is to help you create, execute, and if necessary revise a plan that lets you not only do your own best, most original thinking, but draft a report that meets your readers' needs and their highest expectations.

THE VALUE OF RESEARCH

But first a candid question: Why do research at all? Aside from a grade, what's in it for you?

For those new to research, there are immediate and practical benefits. Learning to do research will help you understand the material you cover as no other kind of work can match. You can evaluate what you read most thoughtfully only when you have experienced the uncertain and often messy process of doing your own research. Writing a report of your own will help you understand the kind of work that lies behind what you find in your textbooks and what experts tell the public. It lets you experience firsthand how new knowledge depends on which questions are

asked and which aren't; how the standard forms for presenting research shape the kinds of questions you ask and answers you offer.

More distantly, the skills you learn now will be crucial when you do advanced work in whatever field you choose to study. Even more distantly, the skills of research will pay off long after you leave school, especially in a time aptly named the "Age of Information" (or, too often, of *Mis*information). Sound research reported clearly has immense value now that the Internet and cable flood us with more information than we can absorb, much less evaluate, especially when so much of it is based on research that we rely on at our peril. And though some might think it idealistic, a final reason for doing research is the pleasure it offers in solving a puzzle, the satisfaction of discovering something that no one else knows and that contributes to the wealth of human knowledge and understanding.

Research, though, is not the sort of thing you learn once and for all. Each of the three of us has faced research projects that forced us to take a fresh look at how we do our work. Whenever we've addressed our research to a new research community, we've had to learn its principles to help us focus on what is important to its members. But even then, we could still rely on some common principles that all research communities follow, principles that we describe in this book. We think these principles will be useful not only now but through the years as your circumstances change and your research assignments (and your readers) become increasingly demanding.

But we must be candid: Doing research carefully and reporting it clearly are hard work. They consist of many tasks, often competing for your attention at the same time. However carefully you plan, research follows a crooked path, taking unexpected turns, even looping back on itself. As complex as that process is, though, we will work through it step-by-step. When you can manage the parts, you can manage the whole and then look forward to more research with greater confidence.

Floods of Misinformation

Since the 9/11 attack on the World Trade Center, the U.S. government has been challenged not only to root out terrorism but to counter bizarre claims that have circulated in the Middle East, especially on the Internet: no Muslims were among the hijackers; Jews had advance notice and stayed home; the attacks were the work of the CIA. These claims have been widely believed to be true, even though no evidence backs them up.

Before we feel superior, however, we should recall some bizarre stories believed by many Americans: the CIA started the AIDS epidemic to kill homosexuals and African Americans; the government still hides the bodies of aliens in Area 51; bar codes are a UN conspiracy to take over the world. Every society succumbs to outlandish beliefs, but we all can learn to see through them and to make a case for what we believe is true. It won't convince everyone, but it might convince some, including ourselves.

HOW TO USE THIS BOOK

The best way to deal with the complexity of research (and its anxiety) is to read this book twice. First skim it to see what lies before you (skip ahead when you feel confused or bored). Then as you begin your work, read carefully the chapters relevant to the task at hand. If you are wholly new to research, start rereading from the beginning. If you are in an intermediate course but not yet at home in your field, skim part I, then concentrate on the rest. If you consider yourself an experienced researcher, you will probably find chapter 4 and parts III and IV most useful.

In part I, we address what those of you undertaking your first project have to think about consciously: why readers expect you to write up your research in particular ways (chapter 1), and why you should think of your project not as solitary work but as a conversation with those whose work you read and then with those who will read yours (chapter 2).

In part II, we discuss how to frame and develop your project. We explain

- how to carve out a topic from an interest, then how to focus and question it (chapter 3);
- how to transform those questions into a research problem (chapter 4);
- how to find sources to guide the search for answers (chapter 5);
- how to use those sources and think through what you find (chapter 6).

In part III, we discuss how to assemble a sound case in support of your claim. That includes

- an overview of the elements of a research argument (chapter 7);
- what counts as a significant claim (chapter 8);
- what count as good reasons and sound evidence (chapter 9);
- why and how you must acknowledge questions, objections, and alternatives and respond to them (chapter 10);
- how you justify the logic of your argument (chapter 11).

In part IV, we lay out the steps in producing your report:

- how to plan and write a first draft (chapter 12);
- how to test and revise it (chapter 13);
- how to write an introduction and conclusion that convince readers that your report is worth their time (chapter 14);
- how to present complex quantitative evidence clearly and pointedly (chapter 15);
- how to edit your style to make it clear, direct, and readable (chapter 16).

In an afterword, "The Ethics of Research," we reflect on a matter that goes beyond professional competence. Doing and re-

porting research is a social activity with an ethical dimension. We all know of recent scandals about the dishonest research of historians, scientists, stock analysts, and others, and we see plagiarism spreading among writers at all levels of achievement, from secondary school students to those at the top of their professions. Such events emphasize the importance of hard thinking about what constitutes *ethical* research and its reporting.

Between some of the chapters you will find "Quick Tips," brief sections that complement the chapters. Some Quick Tips are checklists; some discuss additional considerations for advanced students; several address matters not raised in the chapters. But all add something new.

At the end of this book, there is a brief survey of recent work in the issues we address in this book, an essay aimed at those who teach research, and a bibliography of sources for beginning researchers and for those getting into particular fields.

Research is hard work, but like any challenging job done well, both the process and the results can bring real personal satisfaction. No small part of that satisfaction comes from knowing that your work supports and sustains the fabric of your community. That sense of contributing to a community is never more rewarding than when you discover something that you believe can improve your readers' lives by changing what and how they think.

CHAPTER ONE

Thinking in Print

THE USES OF RESEARCH, PUBLIC AND PRIVATE

In this chapter, we define research, then discuss how you will benefit from learning to do it well, why we value it, and why we hope you will learn to value it too.

Whenever you read about a scientific breakthrough or a crisis in world affairs, you benefit from the research of those who reported it, who themselves benefited from the research of countless others. When you stand in the reading room of a library to pursue your own work, you are surrounded by centuries of research. When you log on to the Internet, you have access to millions of research reports. All those reports are the product of researchers who have posed endless questions and problems, gathered untold amounts of information, worked out answers and solutions, and then shared them with the rest of us.

Teachers at all levels devote their lives to research. Governments spend billions on it, and businesses even more. Research goes on in laboratories and libraries, in jungles and ocean depths, in caves and in outer space. It stands behind every new technology, product, or scientific discovery—and most of the old ones. Research is in fact the world's biggest industry. Those who cannot reliably do research or evaluate the research of others will find themselves on the sidelines in a world that increasingly depends on sound ideas based on good information produced by trustworthy inquiry.

In fact, research reported by others, in writing, is the source of most of what we all believe. Of your three authors, only Williams has ever set foot in Australia, but Booth and Colomb are

porting research is a social activity with an ethical dimension. We all know of recent scandals about the dishonest research of historians, scientists, stock analysts, and others, and we see plagiarism spreading among writers at all levels of achievement, from secondary school students to those at the top of their professions. Such events emphasize the importance of hard thinking about what constitutes *ethical* research and its reporting.

Between some of the chapters you will find "Quick Tips," brief sections that complement the chapters. Some Quick Tips are checklists; some discuss additional considerations for advanced students; several address matters not raised in the chapters. But all add something new.

At the end of this book, there is a brief survey of recent work in the issues we address in this book, an essay aimed at those who teach research, and a bibliography of sources for beginning researchers and for those getting into particular fields.

Research is hard work, but like any challenging job done well, both the process and the results can bring real personal satisfaction. No small part of that satisfaction comes from knowing that your work supports and sustains the fabric of your community. That sense of contributing to a community is never more rewarding than when you discover something that you believe can improve your readers' lives by changing what and how they think.

CHAPTER ONE

Thinking in Print

THE USES OF RESEARCH, PUBLIC AND PRIVATE

In this chapter, we define research, then discuss how you will benefit from learning to do it well, why we value it, and why we hope you will learn to value it too.

Whenever you read about a scientific breakthrough or a crisis in world affairs, you benefit from the research of those who reported it, who themselves benefited from the research of countless others. When you stand in the reading room of a library to pursue your own work, you are surrounded by centuries of research. When you log on to the Internet, you have access to millions of research reports. All those reports are the product of researchers who have posed endless questions and problems, gathered untold amounts of information, worked out answers and solutions, and then shared them with the rest of us.

Teachers at all levels devote their lives to research. Governments spend billions on it, and businesses even more. Research goes on in laboratories and libraries, in jungles and ocean depths, in caves and in outer space. It stands behind every new technology, product, or scientific discovery—and most of the old ones. Research is in fact the world's biggest industry. Those who cannot reliably do research or evaluate the research of others will find themselves on the sidelines in a world that increasingly depends on sound ideas based on good information produced by trustworthy inquiry.

In fact, research reported by others, in writing, is the source of most of what we all believe. Of your three authors, only Williams has ever set foot in Australia, but Booth and Colomb are

certain that it exists, because for a lifetime they have read about it in reports they trust and seen it on reliable maps (and heard about it from Williams). None of us has been to Venus, but we believe that it is hot, dry, and mountainous. Why? Because that's what we've read in reports we trust. Whenever we "look something up," our research depends on the research of others. But we can trust their research only if we can trust that they did it carefully and reported it accurately.

1.1 WHAT IS RESEARCH?

In the broadest terms, everyone does research: we all gather information to answer a question that solves a problem. You do it every day.

PROBLEM: You need a new head gasket for a '65 Mustang.
RESEARCH: You call auto parts stores or get on the Internet to see who has one in stock.

PROBLEM: You want to know where Michael Jordan was born.
RESEARCH: You go to the library and look in a biographical dictionary. Or you call up Google.com and then sort through the 410,000+ references to him.

PROBLEM: You want to learn more about a discovery of a new species of tropical fish.
RESEARCH: You search the Internet for articles in newspapers or magazines.

Though we all do that kind of research, we don't all write it up. But we do rely on those who did: the auto parts suppliers, Jordan's biographers, and the fish discoverers—all wrote up the results of their research because they anticipated that one day someone would have a question that their data would answer.

In fact, without trustworthy and tested published research available to all of us, we would be locked in the opinions of the moment, either prisoners of what we alone experience or dupes to everything we hear. Of course, we all want to believe that our opinions are sound; yet mistaken ideas, even dangerous ones,

flourish because too many people accept too many opinions on not very good evidence. And those who act on unsound opinions can lead themselves, and others, to disaster. Just ask the thousands who invested in the failed energy giant Enron because they heard so many good opinions of it from analysts and the media. Only after Enron's deceptive bookkeeping was exposed and analyzed in writing did they see how those high opinions were based on bad, sometimes even faked research.

That's why in this book we will urge you to be amiably skeptical of most of the research you read, to question it, even as you realize how thoroughly you depend on it. Are we three authors 100 percent drop-dead certain that reports of Venus being hot, dry, and mountainous are true? No, but we trust the researchers who have published reports about it, as well as the editors, reviewers, and skeptical readers who have tested those reports and published their own results. So we'll go on thinking that Venus is hot and dry until other researchers report better evidence, tested by other researchers, that shows us otherwise.

If you are reading this book because a teacher has assigned you a research project, you might be tempted to treat it as just a chore or an empty exercise. We hope you won't. You have practical reasons to take the work seriously: you will learn skills that pay off in almost any career you choose. Beyond that, your project invites you to join the oldest and most esteemed of human conversations, one that has been conducted for millennia among philosophers, engineers, biologists, social scientists, historians, literary critics, linguists, theologians—the list of researchers is endless.

Right now, you may feel that the conversation seems one-sided, that you have to listen more than you can speak, and that in any event you have little to contribute. That may be true for the moment. But at some point you will be asked to join a conversation that, at its best, can help you and your community free yourselves from ignorance, prejudice, misunderstanding, and the half-baked ideas that so many charlatans try to impose on us. The world changes every day because of research, not always for

the better. But done well, research is crucial to improving every facet of our lives. It is no exaggeration to say that your research and your reports of it can improve perhaps not the whole world, but at least your corner of it.

1.2 WHY WRITE IT UP?

For some of you, though, the invitation to join the conversation of research may still seem easy to decline. If you undertake it, you will face demanding tasks in finding a good question, searching for sound data, finding and supporting a good answer, and then writing it all up. Even if you turn out a first-rate report, it will likely be read not by an eager world, but only by your teacher. *And, besides,* you may think, *my teacher knows all about my topic. If she just told me the answers or pointed me to the right books, I could concentrate on learning what's in them. What do I gain from writing up my research, other than proving I can do it?*

Here are some answers.

1.2.1 Write to Remember

Researchers write up what they find just to remember it. A few lucky people can retain information without recording it, but most of us get lost when we think about what Smith found in light of Wong's position, and compare both to the odd data in Brunelli, especially as they are supported by Boskowitz—*But wait a minute. I've forgotten what Smith said!* Most researchers can plan and conduct their project only with the help of writing—by listing sources, assembling research summaries, keeping lab notes, making outlines, and so on. What you don't write down you are likely to forget or, worse, to misremember. That's why careful researchers don't wait until they've gathered all their data to start writing: they write from the beginning of their project so that they can hold as much of it in their minds as clearly as they can.

1.2.2 Write to Understand

A second reason for writing is to understand. When you arrange and rearrange the results of your research in new ways, you discover new connections, contrasts, complications, and implications. Even if you could hold in mind everything you found, you would need help to line up arguments that pull in different directions, plot out complicated relationships, sort out disagreements among experts. *I want to use these claims from Wong, but her argument is undercut by Smith's data. When I compare them, I see that Smith ignores this last part of Wong's argument. Aha! If I introduce it with this part from Brunelli, I can focus on the part of Wong's argument that lets me question Smith.* Writing supports thinking, not just by helping you understand better what you have found, but by helping you find in it larger patterns of meaning.

1.2.3 Write to Gain Perspective

The basic reason for writing, though, is to get your thoughts out of your head and onto paper, where you can see them in the clearer light of print, a light that is always brighter and usually less flattering. Just about all of us, students and professionals alike, think our ideas are more coherent in the dark warmth of our minds than they turn out to be in the cold light of day. You improve your thinking when you encourage it with notes, outlines, summaries, commentary, and other forms of thinking on paper. But you can't know what you really *can* think until you separate specific ideas from the swift and muddy flow of thought and fix them in an organized, coherent form.

In short, you should write so that you can remember more accurately, understand better, and see what you think more clearly. (And as you will discover, the better you write, the more critically you will read.)

1.3 WHY A FORMAL REPORT?

Even if you agree that writing is an important part of learning, thinking, and understanding, some of you may still wonder why you can't write it your own way, why you must satisfy the formal constraints imposed by a research community, particularly one that you may not yet belong to (or even want to). The constraints imposed by writing for others often vex students who believe they

have no reason to conform to the practices of a conversation they did nothing to create. *I don't see why I should adopt language and forms that are not mine. What's wrong with my own language? Aren't you just trying to turn me into an academic like yourself? If I write as my teachers expect me to, I risk losing my own identity.*

Such concerns are legitimate (students should raise them more often). But it would be a feeble education that did not change you at all, and the deeper your education, the more it will change the "you" that you think you are, or want to be. That's why it is so important to choose carefully what you study and with whom. But it would be a mistake to think that learning to write sound research reports must threaten your true identity. Learning to do research will not turn you into a clone of your teachers. It will change the way you think, but only by giving you more ways of thinking. You may be different, but you will also be freer to choose who you want to be and what you want to do next.

Perhaps the most important reason for learning to report research in ways readers expect is that you learn more about your ideas and about yourself by testing them against the standards and values of others. Writing for others demands more from you than writing for yourself. By the time you fix your ideas in writing, they are so familiar to you that you need help to see them not for what you want them to be but for what they really are. You reach that end only by imagining, and then meeting, the needs and expectations of others: you create a kind of transaction between you and your readers—what we like to call a *rhetorical community*.

That's why traditional forms and plans are more than empty vessels into which you pour your findings. Those forms have evolved to help writers see their ideas in the brighter light of their readers' expectations and understanding. You will understand your own work better when you explicitly try to anticipate your readers' questions: *How have you evaluated your evidence? Why do you think it is relevant? How do your claims add up? What ideas have you considered but rejected? How can you respond to your readers' predictable questions, reservations, and objections?* All researchers can recall a moment when writing to meet their readers' expectations revealed a flaw or a blunder, or even a great opportunity that escaped them in a first draft written for themselves.

Traditional forms embody the shared practices and values of a research community, matters that contribute to the identity not only of that community but of each of its members. Whatever community you join, you'll be expected to show that you understand its practices by reporting your research in ways that have evolved to communicate it. Once you know the standard forms, you'll have a better idea about your particular community's predictable questions and understand better what its members care about, and why. But what counts as good work is the same in all of them, regardless of whether it is in the academic world or the world of government, commerce, or technology. If you learn to do research well now, you gain an immense advantage, regardless of the kind of research you will do later.

1.4 CONCLUSION

Writing a research report is, finally, thinking in print, but thinking from the point of view of your readers. When you write with others in mind, you give your ideas the critical attention they need and deserve. You disentangle them from your memories and wishes, so that you—and others—can explore, expand, combine, and understand them more fully. Thinking in written form for others can be more careful, more sustained, more attuned to those with different views—more thoughtful—than just about any other kind of thinking.

You can, of course, choose the less demanding path: do just enough to satisfy your teacher. This book can help you do that. But you will shortchange yourself if you do. If instead you find a topic that you care about, ask a question that *you* want to answer, your project can have the fascination of a mystery whose solution rewards your efforts in finding it. Nothing contributes more to a successful research project than your commitment to it.

We wish we could tell you how to balance your belief in the worth of your project with the need to accommodate the demands of teachers and colleagues, but we cannot. If you believe in what you're doing and cannot find anyone else who shares your belief, all you can do is put your head down and press on. With our admiration.

Some of the world's most important research has been done by those who persevered in the face of indifference or even hostility, because they never lost faith in their vision. The geneticist Barbara McClintock struggled for years unappreciated because her research community considered her work uninteresting. But she believed in it and pressed on. When her colleagues finally realized that she had already answered questions that they were just starting to ask, she won science's highest honor, the Nobel Prize.

CHAPTER TWO

Connecting with Your Reader

(RE)CREATING YOUR SELF AND YOUR AUDIENCE

Your research counts for little if no one reads it. Yet even experienced researchers sometimes forget to keep their readers in mind as they plan and draft. In this chapter we show you how to think about readers as you begin your research. We also explain one of the best ways to anticipate how readers will respond—working in collaboration with others.

Most of the important things we do, we do with others. Some students think that research is different: they imagine a solitary scholar reading alone in a hushed library or peering into a microscope surrounded only by glassware and computers. But no place is more filled with voices than a library or lab. Even when you work alone, you silently converse with others when you read a book or call up a website. Every time you go to a source for information, you renew a relationship between writers and readers that may be centuries old. And when you report your own research, you can hope that other voices will respond to yours, so that you can in turn respond to them. And so it goes.

But conversation is a social activity. Both sides have to understand what each expects of the other, what "social role" each is expected to play. And that's especially true when the conversation is in writing and among professional colleagues.

2.1 CREATING ROLES FOR WRITERS AND READERS

When we talk with others in person, we judge them by how well they play the roles expected of them: do they listen carefully, make claims thoughtfully, answer questions directly? It's the same when you read: *Hmmm. Abrams is modest but not careful about this evidence. Quincy has good data but overgeneralizes.* (Right

now, we three expect that you are judging us.) But just as in conversation, these judgments go both ways: readers judge a writer, but a thoughtful writer has in advance also judged her readers, by imagining who they are, what they are like, what they know, what they need and want. And then she uses that judgment to shape what she writes.

For example, the writer of these next two passages judged that she was addressing readers with different levels of knowledge about the chemistry of heart muscles. So she imagined herself in very different relationships with them:

> 1a. The control of cardiac irregularity by calcium blockers can best be explained through an understanding of the calcium activation of muscle groups. The regulatory proteins actin, myosin, tropomyosin, and troponin make up the sarcomere, the basic unit of muscle contraction.

> 1b. Cardiac irregularity occurs when the heart muscle contracts uncontrolably. When a muscle contracts, it uses calcium, so we can control cardiac irregularity with drugs called calcium blockers. To understand how they work, it is first necessary to understand how calcium influences muscle contraction. The basic unit of muscle contraction is the sarcomere. It consists of four proteins that regulate contraction: they are actin, myosin, tropomyosin, and troponin.

In (1a) the writer seems to cast herself and her readers in the roles of equally knowledgeable expert colleagues; in (1b) she casts her reader as someone who knows nothing about the subject and herself as the patient expert, slowly explaining a complicated issue. If she judged correctly, her readers will judge her favorably. But when a writer miscasts readers, she can lose their trust and often their willingness to read. Had she switched audiences for those passages, the nonexpert would likely think (1a) indifferent to his needs and her expert colleagues would judge (1b) to be condescendingly simpleminded.

In fact, writers cannot avoid creating a role for their readers. That's why, in writing this book, we tried to imagine you—what you're like, what you know about research, whether you even care about it. We cast you in a role, created a *persona* for you that we hoped you would comfortably adopt. Then we imagined ourselves in our own persona, talking to the "you" that we imagined you would be willing to be. That was not easy, because there are so many "you's" out there, all different. We hoped to speak as comfortably to those of you starting your first serious research project as to those well into your careers. Only you can judge how well we've managed to talk to and with all of you.

These personas and the relationship you create with your own readers are so important that they are worth thinking about well before you envision a first draft. If you miscast readers, you will leave so many traces in your early drafts that you won't easily fix them in the final one.

2.2 CREATING A RELATIONSHIP WITH YOUR READER: YOUR ROLE

Few people read research reports just for fun. So you have to know what you can offer readers to create a relationship that makes them want to read your report. Beginning researchers too often offer a relationship that caricatures a bad classroom exchange: *Teacher, I know so much less than you, who will give me a grade. So my role is to show you how much information I dug up, and yours is to decide whether I've found enough.* That's a big mistake. Not only does it demean both you and your teacher, but it makes your project just one long, pointless drill. Worst of all, it casts you in a role exactly opposite to that of a true researcher.

In a research report, you have to reverse the roles of teacher and student. As a researcher, you have to adopt the role of someone who knows what others need to know and to cast your reader as someone who doesn't know but needs to. That will be easier if you find a research question that you want to answer and your teacher can't, without your help. (In fact, your teacher is likely to know less than you about your specific question.) But even if

not, you have to step into the kind of relationship researchers have with their readers, one that goes beyond *Here are the facts I've dug up about medieval Tibetan weaving. Did I get them right?*

So your first step in establishing a sound *research* relationship with readers is to offer them more than a collection of known facts. There are three such offers that experienced researchers typically make; the third is most common in academic research. As you begin, imagine that you will offer and your readers will accept one of the three following relationships, but most likely the third.

2.2.1 I've Found Something Really Interesting

You take a step beyond mere data-grubbing when you can say to your readers, *Let me share some information about medieval Tibetan weaving that I think is really interesting.* If you have learned something that interests you and you can demonstrate that interest in your report, that's the best start you can make in learning to do sound research. In an introductory writing course, the interest you seem to take in your work will roughly predict the interest your teacher will take in it.

Ideally, of course, you want her to be as interested in Tibetan weaving as you are, and if you are in a class in Asian art, she may be. But even if not, you still have to cast yourself in the role of someone who has found something interesting, maybe even new and important, *at least to yourself*, and to cast your reader in the role of someone equally interested. As you become more experienced, you'll also be responsible for actually finding an audience who shares those interests. But at the start, you must at least find a role for yourself that shows your own interest, even enthusiasm for what you've found.

2.2.2 I've Found a Solution to a Practical Problem Important to You

You take a bigger step toward focused research when you can imagine saying to readers not just *I have information that might interest you*, but *My information will help you solve a problem you care about.* That is the kind of research that people in business,

commerce, and government do every day. They confront problems whose solutions require research, first just to understand them, and then to figure out how to solve them, problems ranging from homelessness to falling profits to terrorism.

To help you learn that role, teachers sometimes invent "real world" scenarios: an environmental science professor might assign you to write a report for the director of the state Environmental Protection Agency on what to do about cleaning up toxins in a local lake. In this scenario you are not a student dumping data on a teacher, but someone who must play the role of a scientist giving practical, pragmatic advice to someone who needs it. To make your report credible, you have to play the role of a dispassionate expert, able to use the right terminology, cite the right sources, find and present hard evidence, and so on. But most of all, you have to design your report around a specific *intention* that shapes your role: to advise a reader about what he must *do* to solve his problem. That kind of research report is common in the world at large, but is much less common in the academic world than the following one.

2.2.3 I've Found an Answer to a Question Important to You

Although academic researchers sometimes offer advice to people like EPA directors, their most common role is that of the scholar, someone who answers questions so that a research community can simply understand its area of special interest better. Others might later use those answers to solve a practical problem—an arcane discovery about the distribution of prime numbers, for example, helped cryptologists design an unbreakable code. But the research itself aimed primarily at solving not a practical problem, but a *conceptual* one, one defined by incomplete knowledge or flawed understanding. Some researchers call this "pure" as opposed to "applied" research.

Teachers occasionally invent "real world" scenarios based on conceptual problems: a political science professor asks you to play the role of a senator's intern researching the effect of TV on children's intellectual growth. But more typically they expect you to

imagine yourself as what you are learning to be—a researcher who can address an academic research community interested in a question that its members want to understand better. Your report on medieval Tibetan weaving, for example, might help explain some larger question not entirely understood, perhaps how medieval Tibetan art influenced modern Chinese art.

2.3 CREATING THE OTHER HALF OF THE RELATIONSHIP: THE READER'S ROLE

When you adopt one of those three roles, you create one half of the relationship between you and your readers. You create the other half when you write in a way that casts your readers in a complementary role, one giving them a specific reason to read your report. To do that, you have to imagine them as the kind of readers who expect you to do what you in fact intend to do. In creating those roles, you offer your readers a social contract: *I'll do my part if you do yours.* If you cast them in a role that they accept, but then you create one for yourself that doesn't match, you seem not to be upholding your end of the bargain. But if you offer them a role they are unwilling to adopt, you are likely to lose them entirely.

For example, suppose you are a researcher who is an expert on blimps and zeppelins. You have been invited to share your research with three different groups that have three different reasons for wanting to know what you know.

2.3.1 Entertain Me with Something Interesting I Don't Know

Imagine that the first group that has invited you to speak is the local Zeppelin Club. Its members are fascinated with zeppelins, and though they know a lot about them, they are not experts, just ordinary folk who have made zeppelins their hobby. You decide to share some new facts you've dug up and to tell an entertaining tale or two. You read a letter from Great-Uncle Otto to your father describing a trip on a zeppelin in 1936, and you pass around some photographs and menus he saved.

In planning that report, you judge that not much is at stake

in it other than a diverting hour of zeppelin lore. If so, you fulfill your side of the bargain when you tell them something about zeppelins that is new and interesting to *them*, even unsubstantiated folklore—and you don't bring along overheads, data tables, or footnotes to substantiate your sources. Your audience fulfills its role by listening with interest, maybe by sharing their own anecdotes. You don't expect them to challenge the authenticity of the letter or the menu or ask skeptical questions about how the photos and menus should change their wider understanding of the social history of zeppelins.

Some beginning researchers imagine their readers are like the Zeppelin Club -eager to hear any information new to them. While that sometimes works for experts who find the right audience (see the box below), it rarely works for students learning to do and report research. Your teachers assign you research projects to see not just what you can find, but what you can make of it.

2.3.2 Help Me Solve a Practical Problem

Now imagine that you have been invited to meet with the public relations department of Hotair.com. They suffer from low name recognition and want to use a blimp to get their logo before the public, flying it at sporting events, outdoor concerts, and other large gatherings. But they don't know whether that's a practical solution. So they have hired you as a consultant to tell them how much it will cost, how many days the weather is good enough to fly, and so on. For this group, you won't mention what Great-Uncle Otto had for dinner on his zeppelin flight in 1936. To succeed in this relationship, you must offer them a solution to their problem and only those facts that back it up.

That is the kind of situation you are likely to face if you have a job or internship, or if your teacher creates one of those scenarios for a "real world" writing assignment—you are an environmental scientist advising the state EPA about the polluted lake. Academic researchers do sometimes write on practical problems, but conceptual ones are far more common, even in applied disci-

plines like engineering. So pose a practical problem *only* if your teacher has created a specific scenario for one or you have checked with her first. (We'll discuss practical problems in more detail in the next chapter.)

2.3.3 Help Me Understand Something Better

Now imagine that your audience is the faculty of Zeppo University's Department of Lighter-than-Air Studies (with the same standing as, say, your departments of English or physics). They study the history of blimps and zeppelins, do research on their economics and aerodynamics, and participate in a worldwide conversation about their cultural history and social significance. They compete with one another in producing new knowledge and new lighter-than-air theories that they publish in lighter-than-air journals and books read by everyone in their field.

These scholars have invited you to talk about your specialty: transatlantic zeppelin flights in the late 1930s. They don't want you just to amuse them (though they will be happy if you do) or to help them do something (though they would be pleased to learn how to get consulting work with Hotair.com). What they most want is for you to tell them something they don't know about zeppelins, not just for its own sake, but so that they can better understand something new about them.

Because these lighter-than-air scholars are interested in the Truth about zeppelins, you know they will expect you to be objective, rigorously logical, faithful to the evidence, able to see every question from all sides. You also know that if you don't nail down the facts, they will hammer you during the question period afterward and during cocktails after that, not just to be contentious or even nasty (though some will be), but to get as close as they can to the Truth about zeppelins. If you offer something new, like Great-Uncle Otto's menus, they will want to know where and how you got them, and how those items contribute to their understanding of the topic. And to be sure they're the real thing, they will question you closely about how you know they are authentic.

More important, they will take an interest in those menus only if you can show them how they help answer a question important to their understanding of zeppelins, especially if you can convince them that they do not understand something about zeppelins as well as they thought. If you don't, they will ask you the most vexing question of all. *So what? Why should I care about your menus?*

So you begin your talk:

> As we all have been led to believe by a number of studies on the food service on transatlantic zeppelin flights in the 1930s (especially Schmidt 1986 and Kloepfer 1998), shellfish and other highly perishable items were never served because of fears regarding health. However, I have recently discovered a menu from the July 12, 1936, crossing of the *Hindenburg* indicating that oysters were served at dinner. . . .

That is the kind of conversation you join when you report research to a community of scholars, whether lighter-than-air or not. When you enter into this relationship with them, you must imagine them having this conversation with you in their minds: *Never mind whether your style is graceful (though I will admire your work more if it is); don't bother me with amusing anecdotes about your great-uncle Otto (though I like hearing them if they help me understand your ideas better); ignore whether what you know will make me rich (though I would be happy if it did). Just tell me something that I don't know so that I can better understand the topic of our common interest.*

Since your particular readers will be strongly inclined to adopt this third role, they will think you have fulfilled your side of the bargain only when you meet their expectations and answer their questions, only when you treat them as who they think they are. To be sure, the faculty over in chemistry or philosophy probably won't care much about your views on zeppelins, much less their meal service. *Who cares about the trivia they study over in the Lighter-than-Air Department?* But then you don't have much interest in their issues, either. You are concerned with your *particular* community of readers, with their particular interests and expecta-

tions. The trick is to get your research community to recognize and accept not only the role you've adopted for yourself, but the role you have cast for them—which means you first have to learn what kinds of roles they are willing to play. Several of the following chapters show you how to do that.

Who Cares about *That*?

Academic researchers are regularly chided for their esoteric interests. That charge is usually unfair, but some researchers do seem to have a blinkered fascination with narrow objects of study. Williams once attended the dissertation defense of a Ph.D. candidate who had discovered reels and reels of silent film shot by European anthropologists in Africa and Asia in the early part of the twentieth century. No one had known that those films existed. These new data fascinated most of the examiners, film scholars who never questioned their worth. But when Williams asked, "But how does this discovery improve or even correct our understanding of movies then or *now*?" the candidate had no answer. She merely described again the specific content of the films, concluding, "And no one has ever seen this footage before." Williams asked his question in different ways but never got a better answer. The film scholars, on the other hand, were untroubled, because they, no doubt, were already thinking about how the footage might change their thinking about early film. Besides, they all love the movies. So sometimes new data alone are enough to interest the right readers. But if that candidate hopes to write a research report that gets anyone but a small group of specialists to care about her work, she will have to make an offer better than *Here's some new stuff.*

2.4 WRITING IN GROUPS

One of the best ways to see how the reader-writer relationship works in person is to share your writing in an organized group. A group is better at anticipating what your intended readers will expect and at predicting their responses. A group can also be more critical of its collective work than any individual can. Moreover, a group can bring more resources to bear on a project than someone working alone. So if your teacher does not set up writing groups, ask her to consider doing so. Or form a group on your own. At

the least, recruit some friends to respond to your drafts as surrogate readers. (If you are trapped into working entirely alone, skip to 2.5, p. 30.)

2.4.1 Three Keys for Working Together Successfully

TALK A LOT. Create conditions that get you talking a lot. Set regular meeting times, share e-mail addresses and fax numbers: do what you can to ensure that you talk regularly. At your first meeting, work on telling your "elevator story"—how you would describe your project to a stranger in an elevator as it goes from the first to the twentieth floor. It should describe your question or problem, the kind of claim you expect to offer, and the kind of evidence that supports it. Practice your elevator story at every meeting (even with outside friends), until you can explain your project in a way that everyone thinks is clear and interesting. (You will find the next two chapters particularly useful for this.)

You should also talk about your intended readers. What do they know already, what is important to them, what do you want them to do with your report? Use our checklists to share ideas about readers (pp. 32–33), to ask questions systematically (pp. 45–49), and to reformulate them as a problem (pp. 49–52). The more your group talks together, the better you will write together. You will need to talk less if (like the three of us) you have already worked together and can anticipate how the others think. Yet in writing this book, we three still made scores of phone calls, exchanged hundreds of e-mail messages, and sat together a dozen times (sometimes traveling hundreds of miles to do so).

AGREE TO DISAGREE. Don't expect to agree 100 percent on every issue. You will differ over particulars, sometimes heatedly. In resolving those differences, your group can do its best thinking if everyone is explicit about what each believes and why. On the other hand, nothing impedes progress more than someone's insisting on *his* wording or on including only *her* data. If the first rule of writing in a group is to talk a lot, the second is to keep disagreements in perspective. When you disagree over minor issues with little impact on the whole, forget it.

ORGANIZE AND PLAN. The group should appoint a moderator, facilitator, coordinator, organizer—the job has different names and can either rotate or be permanently assigned. That person keeps track of the schedule, checks progress, moderates discussions, and when the group seems deadlocked, decides which way to go. Someone else should maintain a common outline that is updated regularly, first as a topic outline (p. 187), then as an outline of your argument (p. 139), and finally an outline of your points (p. 188). If your project needs lots of data, someone should maintain a schedule to gather them and a list of sources consulted and still to be consulted, annotated by how useful each source has been or might be. Everyone can stay up to speed if your updated outlines, notes on sources, and comments are put up on a website available to all.

2.4.2 Three Strategies for Working in Groups

Groups can organize their work in three ways, each of which has benefits and risks. Most groups combine these strategies.

DIVIDE AND DELEGATE. This strategy works best when tasks are parceled out to make best use of the special talents of each member. A group working on a survey, for example, might decide that two people are good at gathering data, two others at analyzing them and producing graphics, two more at drafting, and all will take a turn at revising. (Working on this revision, for example, one of us—of course, the youngest—was assigned responsibility for explaining how to use the Internet.) This strategy crucially depends on each member finishing tasks on time. If one fails, all fail.

A risky strategy is to assign whole sections of a document to different members to research, draft, and revise. That works only when the parts of a report are independent, but even then someone has to make the parts hang together, and that can be difficult if members have failed to consult along the way. And if one fails to meet a deadline, all fail.

WORK SIDE BY SIDE. Some groups share all the work all the way. This works best with a small, tightly knit group working on a clearly defined project with ample time, like four engineering students devoting a semester to one design project. The disadvantage is that some people are uncomfortable talking about half-formed ideas before they work them out in writing. Others find it even more difficult to share drafts. To follow this strategy, members must be tolerant with one another. Too often, the most confident person ignores the feelings of others, dominates the process, and blocks progress.

TAKE TURNS. Once all the data have been gathered and an outline agreed on, some groups take turns drafting and revising, so that a text slowly evolves toward a final version. This strategy works when differences among members complement rather than contradict one another. For example, in a group working on a history of stories about the Alamo, one person might be interested in the clash of cultures, another in political consequences, and a third in the role of narrative in popular culture. After sharing what they find, they take turns working on the whole draft. One writer does a rough draft with enough structure so that others can see the shape of the argument. Each member in turn takes over the draft, adding ideas that seem important. The group must agree that the person working on the draft "owns" it while she has it and can change it however she wishes, so long as the changes reflect a common understanding of the main point the whole project supports.

This approach runs two risks. First, the final draft might zigzag from one interest to another. A group that works by turns must agree on a final goal and shape of the whole, and each member must respect the perspectives of the others. Second, you can lose track of who has revised what version of a draft. To avoid confusion, round-robin the drafts so that only one person is working on any one part of a draft at any one time and it is clear who gets the draft next.

Some groups use different strategies at different stages. In early planning, they work side by side until they form a general sense of their problem, then for data-gathering, they divide up the work, then take turns for revision. That's what we did in writ-

ing this book. Early on, we worked side by side until we had an outline, then assigned ourselves separate chapters. When the process stalled, we worked side by side again to revise our plan (that happened three times). Most often, though, each of us drafted individual chapters, then circulated drafts round robin style. As a result, all of the chapters differ from the ones originally drafted, most quite a bit.

Whatever your strategy, the greatest risk is lack of coordination, so be clear who is supposed to do what and when. Then write it down and give everyone a copy. Working in groups is hard work, and it can be especially hard on the ego, but it can also reward those willing to listen to the sometimes harsh but usually helpful judgment of others.

2.5 MANAGING THE UNAVOIDABLE PROBLEM OF INEXPERIENCE

All researchers start as novices. We all face the uneasiness of trying to establish ourselves in a field whose basic rules we don't fully understand, much less all the subtle and unspoken rules that go into acting and writing like a member of our research community. Then, much to our surprise, we feel that novice anxiety again when we begin a new project on a topic that we don't know much about. We three authors have felt those anxieties, not just starting out, but long after our hair had grayed. No one can avoid feeling overwhelmed and anxious at times, but there are some things you can do about it:

- First, be aware that there are uncertainties and anxieties that you cannot avoid. You can learn something about them from a first quick reading of this book. Get over those you can, but don't hold it against yourself when you feel anxious. It is not a sign of incompetence but of inexperience.
- Second, get control over your topic by writing about it along the way. Don't just retype or photocopy sources: write summaries, critiques, questions. The more you write as you go, no matter how sketchily, the more confidently you will face that intimidating first draft.

- Third, understand the whole process by breaking it into manageable steps, but be aware that those steps are mutually supportive. Once you find a topic and formulate a good question, you'll draft and revise more effectively. Conversely, if you anticipate how you will draft and revise, you can more effectively find a problem now.
- Fourth, count on your teacher to understand your struggles. Good teachers want you to succeed, and you can expect their help. (If they don't help, look for other mentors whom you might consult.)

Finally, set realistic goals. You do something significant when you wind up your project feeling that you have changed what you think and that your readers think you did it soundly, even if they don't agree. Most important, recognize the struggle for what it is—a learning experience. To overcome the problems that all beginners face, do what successful researchers do, especially when discouraged: press on, confident that it will turn out OK. Perhaps only "OK—considering." But perhaps even better than OK.

QUICK TIP: *A Checklist for Understanding Your Readers*

Think about your readers from the start, knowing that you'll understand them better as you work through your project. Answer these questions early on, then revisit them when you start planning and again when revising.

1. Who will read my report?
   - Professionals?
   - General readers who are well informed?
   - General readers who know little about the topic?
2. Do they expect me to do what I intend to do? Should I
   - entertain them?
   - provide new factual knowledge?
   - help them understand something better?
   - help them do something to solve a practical problem in the world?
3. How much can I expect them to know?
   - What do they know about my topic?
   - What special interest do they have in it?
   - What are they likely to expect me to discuss?
   - Is the problem one that they already recognize?
   - Is it one that they have but haven't yet recognized?
   - Is the problem not theirs, but only mine?

   - Will they automatically take the problem seriously, or must I labor to convince them that it matters?
4. How will readers respond to the solution/answer in my main claim?
   - Will it contradict what they already believe? How?
   - Will they know some standard arguments against my solution?
   - Will they want to see the steps that led me to the solution?
   - Do they expect my report to follow a standard format? If so, what is it?

PART II

Asking Questions, Finding Answers

Prologue

PLANNING YOUR PROJECT

If you've skimmed this book once, you're ready to begin your project. If you already have a question and know how to answer it, review the next two chapters; then before you start drafting, read the remaining chapters carefully. If, on the other hand, you are starting from scratch, with no clear direction, not even an assigned topic, you may feel bewildered. But you can manage if you have a plan to guide you through your project, one step at a time.

Unfortunately, no plan can lead you straight to that finished report. Early on you may have to spend time reading randomly just to discover what interests you. You may wander up blind alleys or lose yourself in heaps of data. But if you have a plan, it can guide you through that confusion (or even help you avoid it).

Your first four steps in planning are these:

1. Find a topic specific enough to let you master a reasonable amount of information on it: not, for example, *the history of scientific writing*, but *essays in the Proceedings of the Royal Society (1675–1750) as precursors to the modern scientific article*; not *doctors in seventeenth-century drama*, but *Molière's mockery of doctors in his early plays*.

2. Ask questions about that topic until you find some that catch your interest. For example, *How did early Royal Society*

authors guarantee the reliability of their evidence? Or, *How do the differences between their procedures and modern ones reflect differences in the social structure of science?* Or, *Why were doctors objects of Molière's mockery?*

3. Determine what *kind* of evidence that your readers will expect in support of your answer. For example, will they accept data from secondary sources, or will they expect you to consult primary sources as well? Will they expect quantitative data or quotations from authorities?

4. Determine whether you can find sources that have those data.

Once you see in the data that you find at least a plausible answer to your question, you'll be ready to start shaping your materials into an argument (the subject of part III), then to draft and revise it (the subjects of part IV).

Expect to do lots of writing along the way. Much of it will be routine note-taking, but you should also spend time writing to understand: make preliminary outlines; disagree with what you have read; draw diagrams to connect disparate facts; summarize sources, positions, and schools; record even random thoughts. You never know what will pay off. You probably won't include much of this preliminary writing in your final draft: you may even discard it all and start over. But if you *write as you go*, you'll encourage your own best critical thinking, understand your sources better, and draft more effectively when that time comes.

You will discover, however, that you cannot move through those four steps in the neat order we presented them. You'll probably think of a tentative answer and outline a supporting argument before you have all the evidence you need. And when you think you have an argument worth making, you'll probably decide that you need more and maybe different evidence from new sources. You may even modify your topic. Doing research is not like strolling along a well-marked path to a familiar destination; it's more like struggling through overgrown woods, searching for

something you won't know until you find it. But no matter how indirect your path, you can feel confident that you are steadily getting closer to an answer if you manage each step of the way to anticipate the predictable problems.

What Are Your Data?

No matter their field, researchers collect information to use as evidence in support of their claims. But researchers in different fields call that information by different names. Here, we use the term *data*. By *data* we mean more than the numbers that natural and social scientists collect. We mean anything you find "out there" that might support your answer to a question or solution to a problem. The term is rarely used by researchers in the humanities, but they, too, gather data in the form of quotations, historical facts, and so on. Data are inert, however, until you use them as *evidence* to support a *claim*. If you have not collected more data than you can use, you haven't found enough. (Incidentally, remember that *data* is plural; a single bit of data is a *datum*).

CHAPTER THREE

From Topics to Questions

In this chapter we discuss how to explore your interests to find a topic, narrow it to a manageable scope, question it to find the makings of a problem, then turn it into a problem that guides your research. If you are an experienced researcher or already know what topics you want to pursue and why, you might skip to chapter 4. But if you are starting your first project, you will find this chapter useful.

If you are free to research any topic that interests you, that freedom can be frustrating—so many choices, so little time. At some point, you have to settle on a topic, but beyond a topic, you also have to find a reason beyond your assignment to devote weeks or months pursuing it and writing up what you find, then to ask readers to spend their time reading your report.

As we've said, your readers expect you to do more than just mound up and report data; they expect you to report it in a way that continues the ongoing conversation between writers and readers that creates a *community* of researchers. To do that, you must select from all the data you find just those data that support an answer to a question that solves a problem your readers think needs solving. In all research communities, some problems are already "in the air," widely debated and deeply researched, such as whether personality traits like shyness or an attraction to risk are genetically inherited or learned. But other questions may intrigue only the researcher: *Why do cats rub their faces against us? Why do the big nuts end up at the top of the can?* That's how a lot of research begins—not with a "big" question known to everyone in a field, but with a mental itch that only one researcher feels the need to scratch.

If you have such an itch, good. But as we've said (and will say

again), at some point, you have to decide whether the answer to your private question is also significant to others: to a teacher, colleagues, other researchers, or even to a public whose lives your research could change. At that point, you aim not just to answer a question, but to pose and solve a *problem* that others also think is worth solving.

Now that word *problem* is itself a problem: commonly, a problem means trouble, but among researchers it has a meaning so special that we devote all of the next chapter to it. It raises issues that few beginning researchers are able to resolve entirely and that can vex even advanced ones. But before you can address a research problem, you have to find a topic that might lead to one. We'll start there, with finding a topic.

3.1 FROM AN INTEREST TO A TOPIC

Most of us have more than enough interests to pursue, but beginners often find it hard to locate among theirs a topic focused enough to support a research project. A research topic is an interest defined narrowly enough for you to imagine becoming a local expert on it. That doesn't mean that you already know a lot about it or that you will have to learn more about it than your professor has. You just want to know more than you do now.

If your assignment leaves you free to explore any topic within reason, we can offer only a cliché: Start with what interests you most deeply. Nothing contributes to the quality of your work more than your commitment to it. Start by listing two or three interests that you'd like to explore. If you are undertaking a research project in a course in a specific field, skim a recent textbook, talk to other students, or consult your teacher. You might try to identify an interest based on work you are doing or will do in a different course.

If you are still stuck, you can find help either on the Internet or in your library. The Internet may seem the easier way, but it's more likely to lead you astray, especially if you are new to research. Start with the standard guides:

- For a project in a general writing course, start in the library. Look at the headings in a general bibliography such as the *Reader's Guide to Periodical Literature*. If you already have a general focus, use more specialized guides such as the *American Humanities Index* or the *Chicano Index*. (We discuss using these resources in chapter 5 and list many of them on pp. 298–315.)

Scan headings for topics that catch your interest. They will provide not only possible topics, but up-to-date references on them. If you already have an idea for a topic, you can check out the Internet, but if you have no idea what you are looking for, what you find there may overwhelm you. Some indexes are available online, but most don't let you skim only subject headings.

- For a first research project in a particular field, skim headings in specialized indexes, such as the *Philosopher's Index*, the *Psychological Abstracts*, or *Women's Studies Abstracts*.

Once you identify a general area of interest, use the Internet to find out more about it and to help you narrow your topic. (If you are really stuck, see the Quick Tip at the end of this chapter.)

- If you are doing an advanced research project, you might look first for what resources are easily available *before* you settle on a topic.

If you pick a topic and then discover that sources are hard to find, you may have to start over. If you *first* identify resources available in your library or on the Internet, you can plan your research more efficiently, because you will know where to start.

At first, you may not know enough about a general interest like *the use of masks in religious and social contexts* to turn it into a focused topic. If so, you have to do some reading to know what to think about it. Don't read randomly: start with entries in a general encyclopedia, then look at entries in a specialized encyclopedia or dictionary, then browse through journals and websites until you have a grip on the general shape of your topic. Only then will you be able to move on to these next steps.

3.2 FROM A BROAD TOPIC TO A FOCUSED ONE

At this point, you risk settling on a topic so broad that it could be a subheading in an encyclopedia: *Space flight, history of; Shakespeare, problem plays; Natural kinds, doctrine of.* A topic is usually too broad if you can state it in four or five words:

Free will in *War and Peace*	The history of commercial aviation

With a topic so broad, you may be intimidated by the idea of finding, much less reading, even a fraction of the sources available. So you have to narrow it, like this:

Free will in *War and Peace*	→	The conflict of free will and historical inevitability in Tolstoy's description of three battles in *War and Peace*
The history of commercial aviation	→	The crucial contribution of the military in the development of the DC-3 in the early years of commercial aviation

We narrowed those topics by adding words and phrases, but of a special kind: *conflict, description, contribution,* and *development.* Those nouns are derived from verbs expressing actions or relationships: *to conflict, to describe, to contribute,* and *to develop.* Without such words, your topic is a static thing—*free will in War and Peace, the history of commercial aviation.* But when you use nouns derived from verbs, you move your topic a step closer to a *claim* that your readers might find significant.

Note what happens when these topics become statements. Topics (1a) and (2a) change almost not at all:

TOPIC		CLAIM
1a. Free will and historical inevitability in Tolstoy's *War and Peace*	→	There is free will and historical inevitability in Tolstoy's *War and Peace*.
2a. The history of commercial aviation	→	Commercial aviation has a history.

Topics (1b) and (2b), on the other hand, are closer to claims that a reader might find interesting:

1b. The *conflict* of free will and historical inevitability in Tolstoy's *description* of three battles in *War and Peace*	→	In *War and Peace*, Tolstoy *describes* three battles in a way that makes free will *conflict* with historical inevitability.
2b. The *crucial contribution* of the military in the *development* of the DC-3 in the early years of commercial aviation	→	In the early years of commercial aviation, the military *crucially contributed* to the way the DC-3 *developed*.

Such claims will at first seem weak, but you will develop them into more specific ones as you develop your project.

A more specific topic also helps you see gaps, puzzles, and inconsistencies that you can ask about when you turn your *topic* into a research *question* (more about that in a moment). A specific topic can also serve as your working title, a short answer when someone asks you what you are working on.

Caution: Don't narrow your topic so much that you can't find enough data on it:

TOO MANY DATA AVAILABLE	TOO FEW DATA AVAILABLE
The history of commercial aviation:	The decision to lengthen the winglips on the DC-3 prototype because the military wanted to use the DC-3 as a cargo carrier

3.3 FROM A FOCUSED TOPIC TO QUESTIONS

In taking this next step, researchers often make a beginner's mistake: they rush from a topic to a data dump. Once they hit on a topic that feels promising, something like *the political origins and uses of legends about the Battle of the Alamo*, they go straight to searching out sources—different versions of the story in books and films, Mexican and American, nineteenth century and twentieth. They accumulate a mound of summaries of the stories, descriptions of their differences and similarities, ways in which they conflict with what modern historians think happened. They write all that up and conclude, "Thus we see many interesting differences and similarities between . . ."

Most high school teachers would give such a report a passing grade, because it shows that the student can focus on a topic, find data on it, and assemble those data into a report—no small achievement for a first project. But in any advanced course, including a first-year writing course in college, such a report falls short because it offers only random bits of information. If the writer asks no *question* worth pondering, he can offer no focused answer worth reading. Readers of research reports don't want just information; they want the answer to a question worth asking. To be sure, those fascinated by a topic often feel that *any* information about it is worth reading for its own sake: collectors of Japanese coins or Elvis Presley movie posters will read anything about them. Serious researchers, however, do not report data for their own sake, but to support the answer to a question that they (and they hope their readers) think is worth asking.

The best way to find out what you do not know about a topic is to barrage it with questions. First ask the predictable ones of your field. For example, a historian's first questions about the Alamo stories would concern their sources, development, and accuracy. Also ask the standard journalistic questions *who, what, when,* and *where,* but focus on *how* and *why.* Finally, you can systematically ask four kinds of analytical questions about the composition, history, categorization, and values of your topic. Record the questions, but don't stop for answers. (And don't worry about fitting the questions into the right categories; use the categories only to stimulate you to ask them and to organize their answers.)

3.3.1 Identify the Parts and How They Interrelate

- What are the parts of your topic, and how do they relate to one another?

  In stories about the Alamo, what are the themes, the plot structure, the main characters? How do the characters relate to the plot, the plot to the actual battle, the battle to the characters, the characters to one another?

- How is your topic part of a larger system?

  How have politicians used the story? What role does it have in Mexican history? What role does it have in U.S. history? Who told the stories? Who listened? How does their nationality affect the story?

3.3.2 Trace Its Own History and Its Role in a Larger History

- How and why has your topic changed through time, as something with its own history?

  How have the stories developed? How have different stories developed differently? How have audiences changed? How have the storytellers changed? How have their motives to tell the stories changed?

- How and why is your topic an episode in a larger history?

  How do the stories fit into a historical sequence of events? What caused them to change? How did they affect national identity in the United States? In Mexico? Why have they endured so long?

3.3.3 Identify Its Characteristics and the Categories that Include It

- What kind of thing is your topic? What is its range of variation? How are instances of it similar to and different from one another?

  What is the most typical story? How do others differ? Which is most different? How do the written and oral stories differ from the movie versions? How are Mexican stories different from those told in the States?

- To what larger categories can your topic be assigned? How does that help us understand it?

  What other stories in U.S. history are like the story of the Battle of the Alamo? In Mexican history? How do the stories compare to other mythic battle stories? What other societies produce similar stories?

3.3.4 Determine Its Value

- What values does your topic reflect? What values does it support? Contradict?

  What moral lesson does the story teach, if any? Whose purposes does each story serve? Who is praised? Who blamed? Why?

- How good or bad is your topic? Is it useful?

  Are some stories better than others? More sophisticated than others? What version is the best one? The worst one? Which parts are most accurate? Which least?

3.3.5 Evaluate Your Questions

When you run out of questions (or think, Enough!), it's time to evaluate them. First, set aside questions whose answers you could look up in a reference work. Questions that ask *who*, *what*, *when*, or *where* are important, but they may ask only about matters of settled fact (though not always). Questions that ask *how* and *why* are more likely to invite deeper research and lead to more interesting answers.

Next, try to combine smaller questions into larger, more significant ones. For example, several Alamo questions revolve around the issue of the interests of the storytellers and their effects on the stories:

> How have politicians used the story? What role does it have in U.S. history? How have the storytellers changed? How have their motives to tell the stories changed? How did the stories affect national identity in the United States? How do the stories compare to other mythic battle stories? Is its moral lesson worth teaching? Whose purposes does each story serve?

Many of these can be combined into a larger, more significant question:

> How and why have tellers of the Alamo story given a mythic quality to the event?

Once you settle on a question or two, you have a guide to doing your research more systematically. A question narrows your search to only those data you need for its answer. And once you have an answer you think you can support, you know it's time to stop hunting. But when you have only a topic, the data you can find on it are, literally, endless; worse, you will never know when you have enough.

Through all this, though, the most important goal is to find questions that challenge you or, better, arouse your intense curiosity. Of course, you can't be sure where any particular question will lead, but this kind of questioning can send you in directions you never imagined, opening you up to new interests, new worlds of research. Finding good questions is an essential step in any project that goes beyond fact-grubbing. With one or two in mind, you are ready for the next steps.

3.4 FROM A MERELY INTERESTING QUESTION TO ITS WIDER SIGNIFICANCE

Even if you are an experienced researcher, you might not be able to take this next step until you are well into your project. If you are a beginner, you may feel that this step is still deeply frustrating even when you've finished it. Nevertheless, once you have a question that grabs your interest, you must pose a tougher question: *Why should this question also grab my readers? What makes it worth asking?*

Start by asking, *So what?* At first, ask it for yourself:

> So what if I don't know or understand how snow geese know where to go in the winter, or how fifteenth-century violin players tuned their instruments, or why the Alamo story has become myth? So what if I can't answer those questions?

Eventually, you will have to answer this question not just for yourself but for your readers. Finding its answer vexes all researchers, beginners and experienced alike, because it's so hard to predict what will really interest readers. Instead of trying to answer instantly, though, you can work toward an answer in three steps.

3.4.1 Step 1: Name Your Topic

If you are just beginning a project, with only a topic and maybe the glimmerings of a few good questions, describe your topic in a sentence as specific as you can make it (glance back at pp. 43–45):

> I am trying to learn about (working on, studying) _____.

Fill in the blank with your topic. Be sure to use some of those nouns based on verbs or adjectives:

I am studying *diagnostic processes* in the *repair* of cooling systems.

I am working on Lincoln's *beliefs* about *predestination* in his early speeches.

3.4.2 Step 2: Add a Question

As soon as you can, add to that sentence an indirect question that specifies something that you do not know or understand about your topic but want to:

1. *I am studying X*
   2. *because I want to find out* who/what/when/where/whether/why/how _____

1. *I am studying* diagnostic processes in the repair of cooling systems
   2. *because I am trying to find out how* expert repairers diagnose failures.

1. *I am working on* Lincoln's beliefs about predestination in his early speeches
   2. *because I want to find out how* his belief in destiny influenced his understanding of the causes of the Civil War.

When you add that *because-I-want-to-find-out-how/why* clause, you state why you are pursuing your topic: to answer a question important to you.

If you are doing one of your first research projects and you get this far, congratulate yourself, because you have framed your project in a way that moves it beyond the kind of aimless collection and reporting of data that afflicts too much research. But now go one step more, if you can.

3.4.3 Step 3: Motivate Your Question

This step is a hard one, but it lets you know whether your question is not just interesting to you but possibly significant to others. To do that, add another indirect question, a bigger and more general one that explains why you are asking your first question.

Introduce this second implied question with *in order to help my reader understand* how, why, or whether:

1. *I am studying* diagnostic processes in the repair of cooling systems
   2. *because I am trying to find out how* expert repairers analyze failures.
      3. *in order to help my reader understand how* to design a computerized system that can diagnose and prevent failures.

1. *I am working on* Lincoln's beliefs about predestination in his early speeches
   2. *because I want to find out how* his belief in destiny and God's will influenced his understanding of the causes of the Civil War.
      3. *in order to help my reader understand how* his religious beliefs may have influenced his military decisions.

It's your answer to the third step that will give you a claim on your readers' interest. If that larger question touches on issues important to your field, even indirectly, then you have reason to think that your readers should care about its answer, and so care about your answer to the smaller, prior question you raise in step 2.

A few researchers can flesh out this whole pattern even before they start gathering data, because they are working on a well-known question, some widely investigated problem that others in their field are already interested in. In fact, advanced researchers often begin their research with questions that others have asked before but not answered thoroughly or maybe even correctly. But many researchers, including at times the three of us, find that they can't flesh out these steps until they're nearly finished. And too many write up their research results without having thought through these steps at all.

At the beginning of your project, you may not be able to get past the first step of naming your topic. But regularly test your progress by asking a roommate, relative, or friend to *force* you to

question your topic and to flesh out those three steps. Even if you can't take them all confidently, you'll know where you are and where you still have to go.

To summarize: Your aim is to explain

1. what you are writing about—your topic: *I am studying . . .*
2. what you don't know about it—your question: *because I want to find out . . .*
3. why you want your reader to know about it—your rationale: *in order to help my reader understand better . . .*

If you are just beginning serious research, don't be discouraged if you never get past that second step. As long as your question is interesting to you, plow ahead. Your teacher should be satisfied, because you have changed the terms of your project from simply gathering data to asking and answering a question.

If you are a graduate student doing advanced research, however, you must take that last step, because answering that last question will help you create the relationship you are working to establish with the rest of your research community. It's your ticket into the conversation.

In the following chapters, we will return to those three steps and their implied questions, because as you'll see, they are crucial not just for finding good specific questions that you want to answer, but for finding and then expressing the problem that you want your readers to recognize and value.

QUICK TIP: *Finding Topics*

If you have experience in your field but are stuck for a topic, you can find one with some quick research. Read recent articles and review essays and, if they are available, recent dissertations. Look closely at the conclusions: they often suggest further lines of research. You can also browse the archives of an Internet discussion list in your field: look for points of current controversy.

But if you are a beginner and your teacher has not suggested specific topics, start with our suggestions about skimming bibliographical guides (pp. 298–315). If you still draw a blank, try these steps.

FOR GENERAL TOPICS

1. What special interest do you have—sailing, chess, finches, old comic books? The less common, the better. Investigate something about it you don't know: its origins, its technology, how it is practiced in another culture, and so on.
2. Where would you like to go? Surf the Internet, finding out all you can about it. What particular aspect surprises you or makes you want to know more?
3. Wander through a museum with exhibitions that appeal to you—artworks, dinosaurs, automobiles. If you can't get there in person, browse a "virtual museum" on the Internet. Stop when something catches your interest. What more do you want to know about it?
4. Wander through a shopping mall or store, asking yourself, *How do they make that?* or, *I wonder who thought up that product?*
5. Leaf through a Sunday newspaper, especially its features sections, until something catches your eye. Skim reviews of books or movies, in newspapers or on the Internet.

6. Browse a large magazine rack. Look for trade magazines or those that cater to specialized interests. Investigate whatever catches your interest.

7. If you can use an Internet newsreader, look through the list of "all" newsgroups until you find one that sounds interesting. Read the posts, looking for something that surprises you or that you disagree with.

8. Tune into talk radio or interview programs on TV until you hear a claim you disagree with. Or find something to disagree with on the websites connected with well-known talk shows. See whether you can make a real case to refute it, instead of just shouting back.

9. Use an Internet search engine to find websites about something people collect. (Narrow the search to exclude dot-com sites.) You'll get hundreds of hits, but look only at the ones that surprise you.

10. Is there a common belief that you suspect is much too simplistic, or just plain wrong? Or a common practice that you detest? Don't just pronounce the belief or practice wrong, but instead probe for something you can show about it that might lead others to reconsider.

FOR TOPICS FOCUSED ON A PARTICULAR FIELD

1. Browse through a textbook of a course that is one level beyond yours or a course that you know you will have to take some time in the future. Look especially hard at the study questions.

2. Attend a lecture for an advanced class in your field, and listen for something you disagree with, don't understand, or want to know more about.

3. Ask your instructor about the most contested issue in your field.

4. Find an Internet discussion list in your field. Browse its archives, looking for matters of controversy or uncertainty.

5. Surf the websites of departments at major universities, including class websites. Also check sites of museums, national associations, and government agencies, if they seem relevant.