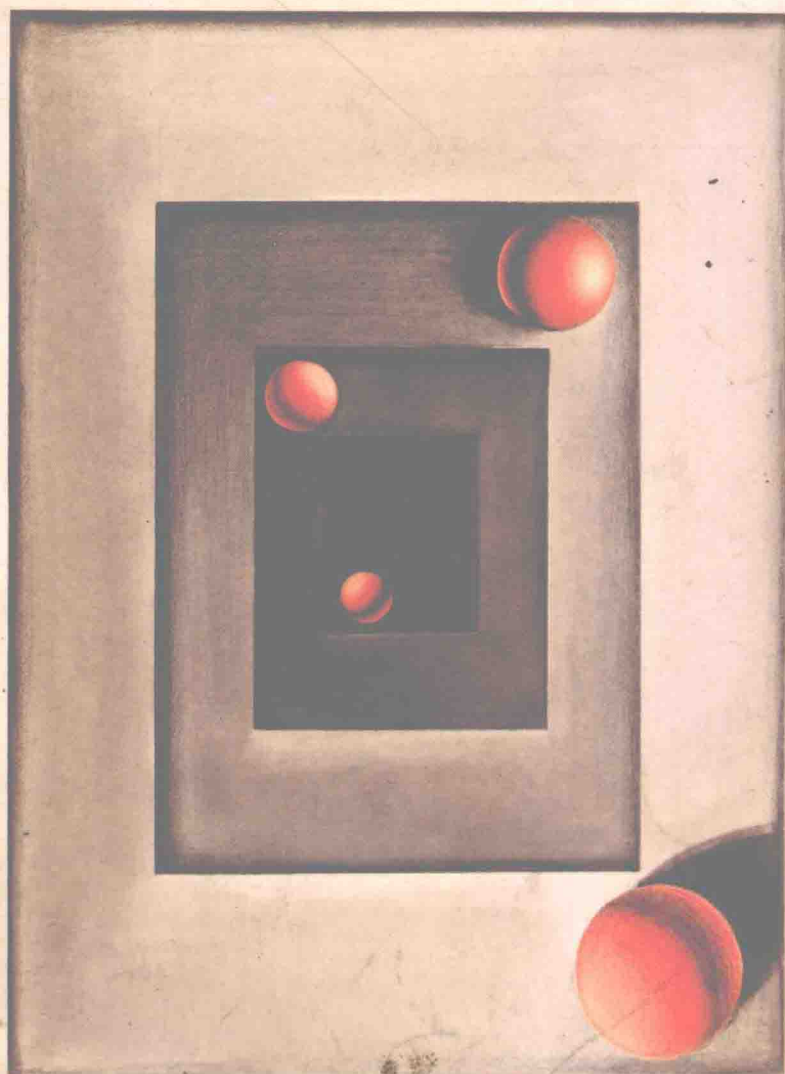


INFORMAL LOGIC

Possible Worlds and Imagination



John Eric Nolt

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INFORMAL LOGIC

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and Imagination

*To my parents,
Herbert J. Nolt and Jane E. Nolt*

Preface

Interest in informal logic has increased rapidly over the last decade or so. This seems to be due to a coincidence of two factors: (1) the realization that even the sophisticated formalisms of the twentieth century are of limited utility in practical reasoning and (2) a growing demand for a logic which does work efficiently in practice. The inadequacies of formal logic have long been evident to many; they formed a central theme of the ordinary-language school of philosophy which flourished in the 1950s and 1960s. But it was only in the late 1960s and early 1970s, with the wave of strident calls for a curriculum "relevant to life," that many logicians began to look anew at the problem of application.

An early pioneer in this direction was Monroe Beardsley, whose *Practical Logic* (1950) introduced the argument-diagramming technique now used in many informal logic texts. But Beardsley's technique did not achieve widespread attention until after the appearance of Steven N. Thomas' groundbreaking book *Practical Reasoning in Natural Language* (1973). Thomas revised and expanded Beardsley's method and deftly demonstrated its flex-

ibility and breadth, showing that informal logic met an unmistakable need. Thomas' book is now a classic; had it not been unavailable for a brief period between editions, I might not have been motivated to begin this one. My debt to Thomas will be obvious to anyone familiar with his work.

A new text can be justified only if it offers substantial innovations. The present work offers several. Most fundamental is the introduction of the apparatus of possible worlds as a comprehensive framework for organizing and clarifying major logical concepts. This provides unity and rigor beyond the standard customary in informal logic. It also gives the reader early familiarity with ideas now indispensable in advanced logic and analytic philosophy. New techniques for argument evaluation, less haphazard and subjective than the usual informal methods, emerge smoothly from this conceptual framework (see Chapter 3).

A second innovation, too often neglected in introductory texts, is a discussion of argument construction (Chapter 9). Skill in formulating rationally persuasive arguments is no less important than skill in argument analysis and evaluation, and an introduction to logic should neglect neither.

Finally, in recognition of the fact that informal logic is not an isolated discipline, but complements and merges with more formal studies, I have included a chapter on formal logic (Chapter 10). For readers who wish to advance into the formal realm, Chapter 10 should ease the transition.

On the negative side, I have omitted much that is standard in traditional introductions to logic. There is, for example, no extensive discussion of categorical syllogisms. The main reason, of course, is that syllogistic logic is formal, not informal. But even in the chapter on formal logic, categorical syllogisms receive only cursory treatment. This is because for nearly a century now we have had something far more comprehensive and efficient—the predicate calculus. Continuing to teach logic by syllogisms is like continuing to teach arithmetic by Roman numerals.

Though I discuss correlations and causes extensively (Sections 6.7 and 6.8), there is no explicit discussion of Mill's methods. Instead, causes and correlations are dealt with as they occur in actual arguments. I believe that this approach is more readily applicable than Mill's rather artificial techniques.

Definitions of major concepts used in this book are frankly stipulative and sometimes at variance with tradition. I define a fallacy, for example, as an argument such that even if its premises were true, its conclusion, based on these premises, would not be probable, and I stick to this definition very strictly. The traditional concept is a hodgepodge under which are included some valid arguments (e.g., begging the question), some rhetorical tricks (e.g., complex questions), some arguments with false premises (e.g., false dilemmas), and some genuine faulty reasoning. Lumping these diverse errors into a single category blunts understanding of their differences and, in my experience, creates endless confusion. Where I have thus departed from tradition, my aim has always been to fashion a conceptual system which is maximally clear, coherent, and useful.

Logical possibility, perhaps the most central concept in this system, is defined as coherent conceivability or imaginability, abstracting from the mental limitations of particular individuals. This provides the reader a natural passage into logical thought from ground which is already intimately familiar—his or her own imagination. Indeed, the role of imagination in logic is this book's leading theme, as its subtitle indicates.

Logically sophisticated readers will notice many points at which fine details, ambiguities, and nuances are passed over without comment. Though undoubtedly my own shortsightedness is often at fault, in many cases the omissions are deliberate. This is an introductory work, designed for readers with no previous acquaintance with logic, and too much detail rapidly overburdens a novice's understanding and capacity for interest. Thus, though I have always striven for accuracy, I have sometimes sacrificed thoroughness to more pressing pedagogical needs.

The progression of ideas is generally linear, later chapters presupposing earlier ones. But there is more material here than can easily be covered in a quarter or, probably, even in a semester, so that for classroom use some omission or rearrangement of topics will often be desirable. The following table indicates the extent to which this is possible:

<i>Chapter</i>	<i>Presupposes Sections</i>
2	1.1–1.6
3	1.1–2.8
4	1.1–3.7
5	1.1–4.2
6	1.1–4.2, 5.1–5.2, 5.5 (first part)
7	1.1–3.7, 4.1–4.2, 6.1–6.3
8	1.1–3.7, 4.1–4.2
9	1.1–3.6
10	1.1–3.7, 4.1–4.2, 5.1–5.2, 5.5 (first part)

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Contents

<i>Preface</i>	xi
CHAPTER 1 THE NATURE OF ARGUMENT	1
1.1 Argument Structure	1
1.2 Argument Strength	4
1.3 Recognizing Arguments	11
1.4 Small Interjectory Sermon	16
1.5 Arguments without Indicator Expressions	17
1.6 Explanations and Causal Descriptions	18
CHAPTER 2 DIAGRAMING ARGUMENTS	23
2.1 Bracketing and Diagraming Arguments	23
2.2 Split-Support Arguments	31

viii

2.3	Repeated Statements	35
2.4	Nested and Incomplete Statements	36
2.5	Irrelevant Statements	39
2.6	Premises Used in More than One Inference	40
2.7	Multiple Conclusions	41
2.8	Obscure Arguments	43

CHAPTER 3 EVALUATING ARGUMENTS 52

3.1	Truth or Falsity of Basic Premises	52
3.2	Possible Worlds and the Test for Validity	54
3.3	Probability and the Test for Inductiveness	59
3.4	Evaluating the Reasoning of Simple Arguments	64
3.5	Evaluating the Reasoning of Complex Normal Arguments	70
3.6	Evaluating Overall Argument Strength	75
3.7	Evaluating Split-Support Arguments	89
3.8	Self-Weakening and Fortuitous Strength	92

CHAPTER 4 IMPLICIT PREMISES AND CONCLUSIONS 97

4.1	Criteria for Adding Premises and Conclusions	97
4.2	Applying the Criteria	106
4.3	Rewriting Arguments	116
4.4	Lengthy Passages of Reasoning	137

CHAPTER 5 DEDUCTIVE ARGUMENTS 141

5.1	Validity and Argument Form	141
5.2	Conditionals	148
5.3	Conditional Proof	151
5.4	Reductio ad Absurdum	158
5.5	Logical Necessity, Contingency, and Inconsistency	169
5.6	Begging the Question	176

CHAPTER 6 INDUCTIVE ARGUMENTS 181

6.1	Statistical Syllogism and Related Arguments	182
6.2	Suppressed Evidence	186
6.3	Kinds of Probability	192
6.4	Statistical Generalization	197
6.5	The Principle of the Uniformity of Nature	204

6.6	Induction by Analogy	211
6.7	Correlation	216
6.8	Causation	222
6.9	Scientific Theories	235

CHAPTER 7 FALLACIES 245

7.1	Appeals to the Actions or Opinions of Others	245
7.2	Arguments against the Person	251
7.3	The Aesthetic Fallacy	253
7.4	The Argument from Ignorance	256
7.5	Fallacies of Composition and Division	257
7.6	Fallacies of Ambiguity	260
7.7	Fallacies of Vagueness	267
7.8	Slippery-Slope Fallacies	270

CHAPTER 8 FALSEHOOD, DECEPTION, AND EMOTION 278

8.1	Varieties of Falsehood	278
8.2	Straw Man Arguments	282
8.3	False Dilemmas	283
8.4	Domino Arguments	284
8.5	Gobbledygook	287
8.6	Emotion	288
8.7	Definitions, Good and Bad	290

CHAPTER 9 ARGUMENT CONSTRUCTION 297

9.1	The Nature of Insight	297
9.2	Formulating the Conclusion	299
9.3	Finding Common Ground: The Socratic Method	301
9.4	Clarity	311
9.5	Organization	317

CHAPTER 10 INTRODUCTION TO FORMAL LOGIC 321

10.1	Negation, Conjunction, and Disjunction	322
10.2	Conditionals	333
10.3	Biconditionals	337
10.4	Necessity, Contingency, and Inconsistency Revisited	340

X

10.5 The Truth-Table Test for Validity	342
10.6 A Brief History of Logic	348
<i>Suggestions for Further Study</i>	354
<i>Appendix: The Paradoxes of Inductive Probability</i>	356
<i>Answers to Selected Exercises</i>	358
<i>Acknowledgments</i>	417
<i>Index</i>	419

1

The Nature of Argument

Logic is the study of arguments. This is not to say that logicians study heated emotional confrontations—the kind that result in red faces, clenched fists, raised voices, and occasionally combat. That isn't what the word "argument" means in logic, though it's what it usually means in daily life. In logic, an argument is a process of giving evidence—a process which, fortunately, is best pursued in a calmer state of mind.

1.1 ARGUMENT STRUCTURE

Suppose someone asserts to you that during certain periods of history sorcerers and witches have wielded genuinely supernatural power. Your first inclination, unless you've already made up your mind on the subject, may be to say something like, "Really? What makes you think so?" This reply is a request for evidence—that is, a request for an argument. Perhaps the response would be something like this: "Because a number of historical

documents say so, and these documents are accurate." Just how good is this evidence? Should you believe this person or not? That's the sort of question logic tries to answer.

Let's look more closely at this argument. We see at once that it is composed of two parts: (1) the conclusion, "Sorcerers and witches have wielded genuinely supernatural power," and (2) two sentences expressing the evidence for this conclusion, "A number of historical documents say so," and "These documents are accurate." Each of these sentences is declarative in form. The argument is not composed of questions, commands, exclamations, or the like, but only of sentences which make statements. This is characteristic of arguments. An argument, in fact, may be defined as a sequence of declarative sentences, one of which, called the conclusion, is intended to be evidentially supported by the others, called premises. An argument may have any number of premises, from one on up; but as the definition indicates, it has only one conclusion. In ordinary conversation or writing, the conclusion may occur anywhere in the sequence—at the beginning, in the middle, or at the end. But to avoid confusion it is often convenient to write arguments in a standard form. We'll adopt the convention of writing premises first and the conclusion last. Thus, the standard form of the argument we're discussing is this:

A number of historical documents say that sorcerers and witches have wielded genuinely supernatural power.

These documents are accurate.

∴ Sorcerers and witches have wielded genuinely supernatural power.

The three dots in front of the conclusion mean "therefore." It's customary to put them there.

Note the presence of the phrase "is intended to be" in the definition of "argument." It's there because not all arguments really do evidentially support their conclusions. The purpose of logic is to determine which ones do and which ones don't. To make this determination, we need to answer two questions: (1) Are the premises true? (2) How strong is the reasoning; that is, how likely would the conclusion be if the premises were true? Logic, as we'll see in Chapter 3, deals mainly with the second of these; but we'll begin with the first, using the argument about sorcerers and witches as an illustration.

You've probably already noticed that this argument is not likely to change anyone's mind on the subject. This is because anyone who doubts the conclusion is also likely to doubt the second premise. The first premise, of course, is undeniably true. Such documents exist. There are, for example, extensive records of witch trials in Europe and America; there are even whole books on the subject—such as *Malleus Maleficarum*, written at the end of the fifteenth century by James Sprenger and Heinrich Kramer. But

the accuracy of such sources is surely subject to doubt. Does this mean that they are true for the people who think they're true and false for those who don't? Of course not! There *is* a fact of the matter, regardless of what people think. Believing something does not make it so. You can believe as strongly as you like that you can sprout wings and fly to the moon, but you won't be able to do it. (If you doubt this, experiment! You won't succeed even if you resort to such extravagant means as chanting mantras or frying your brain with hallucinogens. You might feel like you're doing it, but you're not—as anyone watching you could see.) It is worth recalling that at the time *Malleus Maleficarum* was written, nearly everyone believed that the earth was stationary and flat. The earth, however, ignored them. It just rolled on majestically through the heavens in its own self-contained, roughly spherical fashion. In the same way, there are (or were) facts which determine the truth or falsity of *Malleus* itself and similar historical documents, regardless of what anyone believes.

But how can we ascertain these facts? The rational way is to seek further evidence. We might begin by asking the argument's author for his or her reasons for believing the second premise. Once again, our query is a request for an argument. Now suppose the author replies, "I can tell that these documents are accurate because they are remarkably detailed." This is a new argument, which has as its conclusion the second premise of the original argument:

The documents in question are remarkably detailed.

∴ These documents are accurate.

This new argument links with the first to form a **complex argument**, a chain of reasoning in which some premises are supported by others. The simple arguments which make up the links of this chain are called **inferences**. An inference may contain any number of premises, from one on up; but each inference has only one conclusion, and each inference is simple, in the sense that it is not composed of further inferences. Our current example, which now consists of two inferences, can be written in standard form as follows:

The documents in question are remarkably detailed.

∴ These documents are accurate.

These documents say that sorcerers and witches have wielded genuinely supernatural power.

∴ Sorcers and witches have wielded genuinely supernatural power.

The first two statements make up the first inference, and the last three constitute the second. The second statement is a part of both inferences, being the conclusion of the first and a premise of the second. Notice that to keep each inference together as a unit, I switched the order of the premises

in the second inference. This is harmless, since the order of premises within a given inference is irrelevant; and it gives a clearer indication of the argument's structure.

Though the second statement is the conclusion of the first inference, from the point of view of the argument as a whole it is merely a premise. An argument, you should recall, has only one ultimate conclusion, and the conclusion of this one is "Sorcerers and witches have wielded genuinely supernatural power." Statements like the first and third, which have no additional premises supporting them, are called **basic premises** or **assumptions**. Statements like the second, which function as a conclusion of one inference and a premise of the next, are called **nonbasic premises** or **intermediate conclusions**. Nonbasic premises are the points at which the inferences constituting a complex argument link together.

1.2 ARGUMENT STRENGTH

Now that we've surveyed the structure of our argument, let's return to the question of how good it is. This question, as I noted earlier, breaks into two components: (1) Are the premises true? (2) How good is the reasoning? I've already talked a bit about question (1), but now I need to be more precise. The premises relevant to answering question (1) are just the basic ones. As we'll see shortly, if the basic premises are true and the reasoning is fairly strong, then we'll have good evidence for the conclusion. So in answering question (1) we are concerned only with basic premises. The basic premises are:

The documents in question are remarkably detailed.

and

These documents say that sorcerers and witches have wielded genuinely supernatural power.

Both are true. Thus there are no grounds for objection with respect to question (1).

So let's turn to the second question, How strong is the reasoning? In other words, how likely is the conclusion, given the truth of the basic premises? The answer to this question will not be a simple yes or no. Strength of reasoning is a matter of degree, as the following examples illustrate:

All elves drink stout.

Olaf is an elf.

∴ Olaf drinks stout.

95 percent of elves drink stout.

Olaf is an elf.

∴ Olaf drinks stout.

A few elves drink stout.

Olaf is an elf.

∴ Olaf drinks stout.

In the first case, the truth of the premises guarantees the truth of the conclusion. If Olaf is an elf and all elves drink stout, then it *has to be* that Olaf drinks stout. There's no getting around it. In other words, it's impossible for the argument's basic premises to be true and its conclusion false. Such an argument is called a **valid argument** or **deductive argument** (the two terms may be used interchangeably).¹

The second argument is an **invalid argument**; that is, it is possible for its basic premises to be true and its conclusion false. Even if it's true that Olaf is an elf and 95 percent of elves drink stout, Olaf might still be among the 5 percent who don't. But though the basic premises, if true, do not guarantee the truth of the conclusion, they nevertheless make it probable. The reasoning here is still strong, though not as strong as in the first example. We'll call this sort of argument an **inductive argument**.² "Probable" in this

¹Though most logicians agree on the definition of "valid," some define a deductive argument as any argument whose conclusion is *intended to be* certain, given the truth of the basic premises. But in informal reasoning it is usually both pointless and impossible to tell whether this is the intention. So we'll avoid unnecessary complication by using these terms synonymously.

²Sometimes inductive arguments are defined as arguments whose conclusions are *intended to be* merely probable, given the truth of their basic premises. Arguments whose conclusions really would be probable if their basic premises were true (i.e., those which are inductive by the definition I gave) are then termed "inductively correct," "inductively strong," or even "inductively valid." But this distinction, like the corresponding one for deduction (see footnote 1, above) creates more problems than it solves in informal reasoning. Therefore, although we'll recognize degrees of inductive strength (a set of premises which makes a conclusion 97 percent probable constitutes stronger reasoning than one that makes a conclusion only 60 percent probable), we'll ignore the generally unfruitful question of how strong the reasoning is *intended to be*. We're interested, rather, in how strong it really is.

Some readers may be familiar with other, still older, sets of definitions. Arguments used to be considered inductive if they moved from specific premises to general conclusions and deductive if they moved from general premises to specific conclusions. But this definition is now widely rejected. If you are already familiar with one of these other conceptions, note now that it is quite different from the one used in this book. Here we'll stick strictly to the definition I gave above.