Review of “Logic Primer, 2nd edition”

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Book Review


Not having had the pleasure of seeing the first edition to this book, I can’t compare the two. What I will do, then, is simply review this book on its merits without that comparison.

Let’s begin by saying that this is a good book for a first course in straight symbolic logic. Unlike many books used in logic classes, there are no chapters on such things as identifying arguments, categorical syllogisms, informal fallacies, inductive reasoning or probability theory. Logic Primer begins with sentential logic, goes through truth tables, predicate logic (including a system of natural deduction) and models.

In the spirit of minimal “chattiness”, Allen and Hand commence each chapter with a set of well-wrought definitions of terms important for the pages that follow. So, in the beginning of the first chapter, ‘argument’, ‘premises’, and ‘conclusion’ are defined as a team; then ‘validity’, ‘entailment’ and ‘soundness’ on their own. The definitions themselves are typically one-liners, with a comment or two to make an important point. For example, the definition of ‘soundness’ goes like this:

soundness

Definition. An argument is SOUND if and only if it is valid and all its premises are true.

Comment. It follows that all sound arguments have true conclusions.

Comment. An argument may be unsound in either of two ways: it is invalid, or it has one or more false premises.

Comment. The rest of the book is concerned with validity rather than soundness. (p.2)

This last comment proves that Allen and Hand are a little more chatty than they needed to be, since there seems no good pedagogical reason for including the concept of soundness unless this will be important for the student later in the book. Many authors of logic texts refer briefly to ‘soundness’ at one point or another early on, saying pretty much the same sorts of things and then let it go at that. One has to wonder what the point is of talking about soundness if we don’t do anything more with it than provide a definition. Perhaps we’ve all got an argumentum ad vericundiam going and don’t know it.

True to their word about this being a book on symbolic logic, the first occurrence of a special symbol is
on page 3, and the next four pages are very well organized as they lay out the further symbols and concepts of sentential logic. The definitions given are quick, to the point, and by and large, give just the right amount of information. I thought especially well of the author’s comments on ‘denial’. They write,

Definition. The DENIAL of a wff f that is not a negation is \( \sim f \). A negation, \( \sim f \), has two DENIALS: \( f \) and \( \sim \sim f \).

Example. \( \sim (P \supset Q) \) has one negation: \( \sim \sim (P \supset Q) \).

It has two denials: \( (P \supset Q) \) and \( \sim \sim (P \supset Q) \).

\( (P \supset Q) \) has just one denial: its negation, \( \sim (P \supset Q) \). (p. 7)

This is an excellent example to bring to mind the author’s idea that instructors might just want to provide most of the explanations and examples themselves, in class. Certainly a text must give the basic elements of the ideas and techniques to be taught, but it seems a capital notion to let the teacher teach. This book, then, cannot be used effectively by a teacher who will go strictly by the book. Logic Primer needs filling in – this is the intention of the Allen and Hand.

The first time I was given a copy of Patrick Hurley’s *A Concise Introduction to Logic*, I became convinced that he has the best chapter on translations available today. I still feel this way. Allen and Hand do a fair job of it, certainly, but a little more needs to be said, that is, more examples and explanations. They give a bare-bones sketch of translations, but nothing so detailed that someone coming to the book could do it very easily at all. But, again, perhaps this is the teacher’s job. I also find that the exercises in this section wouldn’t be very challenging, even for a novice.

Page 17 and we’re already ready for proofs. Now that’s what I call quick. As with the other sections, this one begins with the right definitions. Many of these definitions contain examples of the proofs the student is set to learn. In fact, the definitions and brief examples of proofs in them comprise the method of teaching out of this book.

The rules used are the usual. A few are:

ampersand-elimination = Simplification

wedge-introduction = Addition

wedge-elimination = Disjunctive Syllogism

arrow-introduction = Rule of Conditional Proof

reductio ad absurdum = Indirect Proof

One of the nice things about the proof system used by Allen and Hand is the “assumption set” for indicating the assumption(s) on which a given line of a proof depends. Fewer and fewer logic texts use assumption sets in their proofs. I’m not sure why this is, because many people still find this further way of “tracking” an enhancement to the rigor of a proof as well as a touch of elegance.

Chapter 2 is devoted exclusively to truth tables. Two words describe it: minimal, clean. A mere one example suffices for showing students how to construct a table for a sentence. No wasted space. What explanations there are for the techniques of truth tables for sentences, arguments, tautologies, and indirect tables for arguments (i.e., the short-cut method) are very clear and few students should have trouble understanding them. There are some potentially confusing typographical errors in the
exercise set for this section of the chapter, however, involving lack of informative
parentheses/groupers. This is mitigated somewhat by the fact that the answers are provided in the
back of the book for each item in the exercise set. So, for example, the student will have to go to
the answers to determine whether

'P v Q ® R v ~P' is a conditional or a disjunction. It turns out that the answers don’t help, at least
with this example. The sentence is reproduced there in the same form as in the text. In addition,
there are some typos in other places in the answers themselves.

There is one partial departure from the strictly symbolic theme of this book. The last section of the
chapter on truth tables is on "English Counterexamples". I say "partial" because the arguments the
authors use as subjects of the counterexamples are given in symbolic terms. So, a counterexample for

\[ P \lor Q, Q \land P \]

is

If Los Angeles is in Canada, then Los Angeles is in North America.
Los Angeles is in North America
Therefore, Los Angeles is in Canada. (p. 53)

Oddly enough, the exercises in this section get no answers in the back. Some of these should have
answers given, if only to indicate to the student whether he/she is on the right track. Again,
however, perhaps this is teacher’s responsibility.

Chapter 3, on predicate logic, begins with the ever instructive definitions and explanations. Included
here are names, letters, variables, and predicates, each of which may or may not have superscripts
and subscripts (though Allen and Hand don’t use them in the text following), identity, and the usual
definitions of quantifiers, sentences, and expressions. I was impressed by the authors’ layout of the
conditions for a well-formed formula. In fact, when I found a sentence they said was not a well-
formed formula which I thought would be, I went back to the conditions and discovered that I
hadn’t read carefully enough. I discovered my error very quickly.

The section on translating English into quantified well-formed formulas is quite nice, being detailed
enough to allow the student to get proficient at this skill. The explanations and examples are right
to the point. Also, with seventy entries in the exercise set, not all answered in the back, both
student and teacher have their work cut out for them.

The proof section has just about all the entries you can deal with in a course of this nature, with
many examples of correct as well as incorrect moves. This section includes identity introduction and
elimination, work on quantifier exchange, sequents, theorems, prenex form. Potential trouble: there
are many exercises, but many fewer answers given than in previously exercise sets.

The last chapter is given to models and countermodels. I found this material well rehearsed,
especially with regard to the definitions at the beginning. The more I dealt with the book, the more
I became convinced that providing thorough definitions at the outset can take away a lot of the need
for the abundance of examples later in the text. Not that further examples are unnecessary, but
rather the teacher can shape the examples to fit the needs of the students present. This should be a big draw.

The authors use a method of truth tables to complete the countermodels for arguments, which is interesting and follows nicely upon knowledge already acquired by the student. The few examples that are given in the text are very helpful and directly to the point under discussion. Each of the other sections in this chapter ("Finite Countermodels for Arguments with Many-Place Predicates without Identity", "Finite Countermodels with Identity" and "Infinite Countermodels") is well worth the time and effort spent.

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