IFL: Logicbite 11

Quotation

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Chapters 9 and 10 of *IFL* introduced PL languages. In Chapters 12 and 13 I will say more about their expressive power, before at last going on to put these languages to work in the formulation and assessment of arguments. In between, in Chapter 11, I pause to say something about quotation.

In just a bit more detail:

(1) PL languages have been the object of our investigations in the last couple of chapters; I've been talking about these languages in English, the language of the book. More generally in logic, we want to distinguish the *object language(s)* we are discussing, and the *metalanguage* we are discussing it in.[1] §11.1 says a little more about this distinction.

(2) When we are talking *about* elements of some language, a typical device is to use quotation marks, e.g. as in

> In PL languages, '$\vee$' expresses inclusive disjunction.

I briefly discuss quotation conventions in §11.2, and the distinction between 'use' and 'mention' (and mention what's going on with the sort of quotation marks I've just used!).

(3) A complication: In an expression like

> If α and β are wffs, so is $(\alpha \vee \beta)$

we have a mix of symbols from different languages – the Greek letters are added to Logician's English (our metalanguage) for handy shorthand purposes, the connectives belong to PL languages. Should we use some of quotation marks to distinguish which is which? §11.3 sorts things out.

(4) So far in *IFL*, I've been very punctilious about the use of quotation marks. The message of §11.4 is: for now on, *r–e–l–a–x*.

(5) In §11.5 I explain why I've chosen to use Greek letters as schematic letters ('metavariables'). OK, that's a stylistic choice, but I suggest a rationale for using a different alphabet to highlight an important difference in status from the casual 'A's and 'B's, 'n's and 'F's we met in early chapters of *IFL*.

(6) Finally, in §11.6, I take up that last point in talking more about the use of Greek-letter schemas to display the 'form' of PL wffs (and eventually of PL arguments).

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So at this point read *IFL* Chapter 11. There follow below a couple of afterthoughts – but come back to read those after you've looked at the chapter itself.

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One day, I'll need to sit down to consider whether I would do better to bring various remarks about the form(s) of PL wffs together in one place, rather than leave them slightly scattered. Or perhaps I should have some better linking between the relevant passages. But for now, just two comments on what I hope is a pretty straightfoward chapter.

[1] Why 'meta'? In a departure from the original meaning of the Greek '$\mu\epsilon\tau\acute{\alpha}$' ('after', 'beside', 'with', etc.), we have come to use meta-X to mean, roughly, something (often X) which is *about* X, as in 'metadata', which is data about data.

First, ask yourself, what – given our convention for quotation marks – does the following expression (1) denote?

> 'Bertrand' followed by a space followed by 'Russell'

Well, the great philosopher's name of course! It denotes the following expression:

> Bertrand Russell

Easy!

But hold on: we said that an expression enclosed in quotes is a quotation-name denoting that very expression. And (1) encloses in quotes the following expression (2):

> Bertrand' followed by a space followed by 'Russell

So is (1) ambiguous, also denoting the ill-formed (2)?!?

It was with this sort of thing in mind that in *IFL* §11.2 I cautiously stated the principle about quotation like this:

> Given an expression beginning with an opening quotation mark and ending with a matching closing quotation mark, the whole expression *including* the quotation marks is to be construed as referring to the word, sentence, or other expression displayed *inside* the quotes.

Note how I sneaked in the crucial 'matching'! Of course, as sensible readers, we take the opening quotation mark in (1) to be matched up with the closing quotation mark after 'Bertrand', not with the one at the end of the sentence. But note there is nothing in (1) as written which explicitly enforces this matching.

So this raises a nice question: can we give a convention for the use of quotation marks which always unambiguously makes it clear which quotation mark is matched to which (including when we have stray quotation marks inside quoted material)? Something for enthusiasts to think about![2]

In §11.3, I wrote that if we want to be super-punctilious in using expressions with a mix of Greek letters and PL symbols "we will have to introduce a new species of quotation marks – corner quotes, often called Quine quotes". That was careless (or downright wrong, depending how charitable you are feeling). OK, we need to introduce a new species of quotation marks *if* our punctiliousness is to be marked by using some kind of quotation mark! But there are other ways of keeping things straight.

Here's Alonzo Church, a paradigm of carefulness, in his *Introduction to Mathematical Logic*. He is here discussing theorizing about the syntax of formal languages like our PL languages: so his 'syntax language' in which we theorize is part of our metalanguage.

> In this book we shall be concerned with the task of formalizing an object language, and theoretical syntax will be treated informally, presupposing in any connection such general knowledge of mathematics as is necessary for the work at hand. . . . In such informal development of syntax, we shall think of the syntax language as being a different language from the object language.

Now, what resources do we need in our metalanguage in theorizing about syntax? We will need variables to generalize over object language expressions, syntactic variables like our Greek letters. But we also want particular constants to pick out particular items in the object language, like the connectives.

[2] There's a lovely paper by George Boolos, 'Quotational Ambiguity', reprinted in his *Logic, Logic and Logic*. Not really for beginners, though.

> As a preliminary to explaining the device to which we resort for syntactical constants, it is desirable first to consider the situation in ordinary English . . . [So] consider the use of English in making syntactical statements about the English language itself.
>
> Frequently found in practice is the use of English words *autonymously* (to adopt a terminology due to Carnap), i.e ., as names of those same words. Examples are such statements as "The second letter of man is a vowel," "Man is monosyllabic," "Man is a noun with an irregular plural." Of course it is equivocal to use the same word, man, both as a proper name of the English word which is spelled by the thirteenth, first, fourteenth letters of the alphabet in that order, and as a common name of featherless plantigrade biped mammals—but an equivocacy which, like many others in the natural languages, is often both convenient and harmless. Whenever there would otherwise be real doubt of the meaning, it may be removed by the use of added words in the sentence, or by the use of quotation marks, or of italics, as in: "The word *man* is monosyllabic" ; "'Man' is - monosyllabic"; "*Man* is monosyllabic."
>
> Following the convenient and natural phraseology of Quine, we may distinguish between *use* and *mention* of a word or symbol. In "Man is a rational animal" the word "man" is used but not mentioned. In "The English translation of the French word *homme* has three letters" the word "man" is mentioned but not used. In "Man is a monosyllable" the word "man" is both mentioned and used, though used in an anomalous manner, namely autonymously.
>
> Frege introduced the device of systematically indicating autonymy by quotation marks, and in his later publications (though not in the *Begriffsschrift*) words and symbols used autonymously are enclosed in single quotation marks in all cases. This has the effect that a word enclosed in single quotation marks is to be treated as a different word from that without the quotation marks—as if the quotation marks were two additional letters in the spelling of the word—and equivocacy is thus removed by providing two different words to correspond to the different meanings. Many recent writers follow Frege in this systematic use of quotation marks, some using double quotation marks in this way, and others following Frege in using single quotation marks for the purpose, in order to reserve double quotation marks for their regular use as punctuation.

But Church himself is not going to follow Frege here.

> To return to the question of syntactical constants for use in developing the syntax of a formalized object language, we find that there is in this case nothing equivocal in using the symbols and formulas of the object language autonymously in the syntax language, provided that care is taken that no formula of the object language is also a formula of the syntax language in any other wise than as an autonym. Therefore we adopt the following practice:
>
> > *The primitive symbols of the object language will be used in the syntax language as names for themselves, and juxtaposition will be used for juxtaposition.*
>
> This is the ordinary usage in mathematical writing, and has the advantage of being self-explanatory.

In other words, in the metalanguage, the vel symbol is used (not to express disjunction) but as a name for the vel symbol in a PL language. And similarly the left-hand bracket symbol is used (at least when talking about PL expressions) as a name for the left-hand bracket in a PL. Hence, when we write in our English metalanguage

> If α and β are wffs, so is $(\alpha \vee \beta)$

this means, by Church's convention and without needing quotation marks,

> If α and β are wffs, so is a left-hand bracket juxtaposed with α juxtaposed with a vel symbol juxtaposed with β juxtaposed with a right-hand bracket.

Which is what Quine-quotes give us but without the fuss. In short, we can be punctilious without Quine-quotes; we just need to officially and explicitly adopt Church's convention.