

Article Title: Susan Stebbing's Logical Interventionism

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Abstract: We examine a contribution L. Susan Stebbing made to the understanding of critical thinking and its relation to formal logic. Stebbing took expertise in formal logic to authorise logical intervention in public debate, specifically in assessing of the validity of everyday reasoning. She held, however, that formal logic is purely the study of logical form. Given the problems of ascertaining logical form in any particular instance, and that logical form does not always track informal validity, it is difficult to see how she could justify her belief in logical interventionism. Her answer to this problem is the contribution we explore here. It involves the view that although the logician's expertise is not sufficient to assess arguments made in everyday contexts on its own, it nevertheless plays a unique role in giving systematicity and direction to the critique of such arguments, in particular, in public debate.

Susan Stebbing's Logical Interventionism

1. Introduction

L. Susan Stebbing was a scholar of pragmatist philosophy, a philosopher of science, a formal logician, and public intellectual, devoted to the teaching of what might today be called 'critical thinking'. Although Stebbing's work was overlooked for a time, it is beginning to be studied usefully (*Beaney 2003; Milkov 2003; Chapman 2013; Beaney 2016; Janssen-Lauret 2017*). Questions remain about how her many projects relate to one another. Here we are concerned with the relation between her reflections on logic and her public teachings on critical thinking. According to Michael Beaney and Siobhan Chapman, Stebbing was 'an advocate of the relevance of logic to everyday questions and problems' (*Beaney and Chapman 2017, §1*). But it is not obvious what precise contribution logic can make to these problems, and certain difficulties arise for anyone proposing that it can help with them. We propose that one of Stebbing's overlooked contributions is a serious attempt to deal with these difficulties.

Stebbing takes logic both to be a purely formal science and to make a contribution to discourse on everyday questions and problems. She was adamant that, although (*Stebbing 1948*, 474):

We do not study logic in order to establish norms by reference to which the validity of reasoning may be tested [...] Nevertheless, this is the aspect that is important from the point of view of reflective thinking, and which makes the study of logic useful even for journalists and politicians.¹

But what can a purely formal science contribute to everyday questions and problems? In most of her explicit statements, Stebbing takes the study of logic, properly conceived, to focus on a formal consequence relation. '[A]ll deduction', she asserts, 'depends upon the *formal*, i.e. the *logical*, properties of the terms that enter into the reasoning' (*Stebbing 1948*, 165). Logicians are concerned to discover these formal properties that determine the valid deduction of one proposition from another. The logician's possible contribution to debates on everyday questions might then seem obvious: she can intervene to advance debates by assessing the validity of the reasoning of the disputants.

We might construe the procedure of such a logical intervention as follows. The logician possesses general knowledge of the logical consequence relation. This means she can construct sentences in an abstract language S; call these the *valid forms* of S. Because the valid forms of S map onto deductively valid arguments, knowledge of S suffices for knowledge of logical consequence.

In assessing the validity of a given argument A, the intervening logician proceeds thus: (i) Determine A's *logical form* F. (ii) Check whether S is capable of generating F. (iii) If it is, A is a valid argument; otherwise A is invalid. If, for instance, A is the argument 'The sun is out and the sky is blue, so the sun is out', and if it is determined to have the form $p \text{ \& } q, \text{ so } p$, and further if the sentence ' $p \text{ \& } q \mid - p$ ' is a theorem of S, then A is valid. The logician is thus able to use her expertise

¹ We refer throughout to the sixth edition of this work. The first edition was published in 1930.

to stand in a position of umpire with respect to arguments – ruling decisively on their deductive validity or invalidity.

This picture of logical interventionism appears to depend on two contentious assumptions:

- (1) Every argument has a unique discoverable logical form.
- (2) A given argument's validity or invalidity can be determined by its form.

We shall show how Stebbing appears to declare commitment to these assumptions at various times. Both of them, however, were subject to criticism by Stebbing's close contemporaries and colleagues, and today it is difficult to accept them as unproblematic. Does this restrict Stebbing's model of logical interventionism to being of mostly historical interest? We argue that it does not. It is not clear that Stebbing was *unqualifiedly* committed to the two assumptions.

This leads us to present a different model of logical intervention to be found in Stebbing's work. In this model, the logician can make a useful contribution to public discourse and the assessment of everyday arguments, but without standing in the position of umpire. Rather than identifying and then assessing the forms of arguments, the logician makes her contribution through ongoing, good-faith dialogue with the non-logician – very much, in fact, in line with Stebbing's own pattern of activity throughout her career. There is no reason to suppose this model to be of merely historical interest.

2. First Assumption: Every argument has a unique discoverable logical form

Stebbing asserts that logic is the study of form. In her *Introduction to Logic*, first published in 1930, she proposes that 'all deduction depends on the formal, i.e. the *logical*, properties of the terms that enter into the reasoning' (*Stebbing 1948, §10.1, 165*). Knowledge of form is what is required to assess the validity of an argument: 'Only when the form of the reasoning is [...] exhibited can the validity of

the reasoning [...] be tested' (*Stebbing 1948*, §25.3, 497).² These statements suggest commitment to the second assumption listed above: that the validity, at least the deductive validity, of an argument is a matter of its form. We shall discuss this assumption in the next section. They also suggest the first assumption – that every argument has a form. At least, Stebbing does not signal any doubt about whether a given piece of reasoning – an argument – *has* a form to be 'exhibited' so as to test its validity. Stebbing is also clear that formal logic applies to arguments in general, not just to arguments in a specific domain: 'the principles of symbolic logic are not peculiar to a special kind of study but are principles exemplified in everyday reflective thinking no less than in mathematical deductions' (*Stebbing 1948*, xii). It is for this reason, Chapman suggests, that her *Modern Introduction to Logic* 'is illustrated throughout with examples concerned with such mundane issues as the weight of a box of chocolates, the process of cooking meat, the difference between house prices in Donegal and Sussex and the exam scores of a class of schoolgirls' (*Chapman 2013*, 51). Does she, then, believe that every piece of human reasoning has a *discoverable* form?

Presumably what Stebbing means by the 'terms that enter into the reasoning' are propositions. Stebbing regards Aristotle as the first to properly recognise 'that propositions have form, and that it is their form that is important in reasoning' (*Stebbing 1948*, §25.2, 479). She considers Aristotelian syllogistic moods as a valid forms, and gives an example of finding one in an argument (*Stebbing 1948*, §10.1, 164):

Consider, for instance, the syllogism: *If all politicians are inconsistent and Baldwin is a politician, then Baldwin is inconsistent.* [...] If we believe that the premisses are true, we shall accept the conclusion as true. But the pure logician is not interested in their truth, or falsity; he is concerned only with the implication, that is, *the form*. If for 'Baldwin' we substitute 'Bernard Shaw', or 'my dog', or 'this desk', or any other given individual, the implication holds. Similarly for 'inconsistent' we could

² Although the quotation is specifically about scientific arguments, it is grounded on claims clearly meant to have universal application.

substitute ‘rich’ or ‘hopeful’ or ‘far’ or ‘trivial’; for ‘politicians’ we could substitute ‘sharks’ or ‘telegrams’ or ‘mice’, and the form would be unaltered.

Earlier Stebbing has argued that ‘the form of a proposition is what remains unchanged although the constituents of the proposition are altered’ (*Stebbing 1948*, §8.3, 126). If we take the example syllogism, and note which terms she proposes to alter, we end up with the form: *If all M are P, and S is M, then M is P* – the syllogistic mood *Barbara*, or something close to it.

Valid argument-forms are expressible as abstract sentences, with variables where non-logical constants would go, such as the example just given. These abstract sentences can be generated by a formal system of axioms and rules (*Stebbing 1948*, §10.4). There is a question of how the relevant formal system is to be chosen. Stebbing admits that the logician has some freedom of choice in selecting primitive axioms, but is nevertheless bound to select those that are ‘sufficient to yield the required results and [are] mutually consistent’ (*Stebbing 1948*, §10.4, 179). She disputes Ayer’s suggestion that ‘the principles of logic can be wholly an affair of convention’ (*Stebbing 1936*, 360). We do not intend to interrogate Stebbing’s method for deriving valid forms. She believes the syllogistic moods to be valid forms (*Stebbing 1915*), thus she includes chapters on traditional syllogistic in both her logic textbooks (*Stebbing 1948*, ch.6; 1943, ch.4). But she is clear that these do not exhaust the valid forms (*Stebbing 1948*, §25.2). The system taught in her logic textbooks is *polyadic* – it generates forms in which quantifiers fall within the scope of other quantifiers, whereas traditional syllogistic is *monadic*. Indeed, Janssen-Lauret points out, her *Introduction to Modern Logic* is ‘the world’s first accessible text on polyadic logic’ (*Janssen-Lauret 2017*, 9). Stebbing outlines the construction of her system in Chapters 10 and 11 of her *Modern Introduction*; it is a system that generates the syllogistic moods and countless other forms.

If it is, in principle, possible to know the form of any argument (the first assumption), it follows that the intervening logician will be in a good position to assess the validity of any argument. She need only determine if the form can be generated by an appropriate system. Given that the form

of an argument seems to consist of the forms of its constituent propositions, every argument will have a form so long as every proposition has a form. This Stebbing appears to hold: ‘Any determinate proposition exhibits a certain propositional form’ (*Stebbing 1948*, §10.3, 126), and Stebbing seems to mean that each proposition has and shows *one* propositional form, not only because of the ‘certain’, but also because in the previous sentence she calls the form ‘*the way in which the constituents are put together*’ (emphasis added).

We can gain some insight into what Stebbing means by speaking of the constituents of a presentation by looking at her article ‘The Method of Analysis in Metaphysics’. Here Stebbing makes a famous distinction between two sorts of analysis, which at this stage she calls *grammatical analysis*, of sentences, and *metaphysical analysis* of propositions. The difference between sentences and propositions is as follows (*Stebbing 1932*, 78):

The sentence is used to state a proposition. Sentences in various different languages may all make the same assertion, i.e., have the same meaning. The linguistic differences between these sentences are irrelevant to metaphysical analysis. Accordingly, philosophers often speak of analysing propositions, not of analysing sentences. The elements of a sentence are words; the elements of a proposition are constituents of the world; if the proposition is true, these constituents of the proposition are the elements of the facts to which the proposition refers.

Stebbing, as we saw, speaks of deductive validity as depending on the form of *propositions*, not of sentences. She is clearly aware that the grammatical form of a sentence can be highly misleading with respect to the logical form of the proposition it expresses (*Stebbing 1948*, 153; *Janssen-Lauret 2017*, 11; 2021). In the *Modern Introduction*, she asserts that when q can be validly deduced from p , p must *entail* q , and p *entails* q , in turn, when ‘ p could not be true and q false’ (*Stebbing 1948*, §12.4, 225-6). If deductive validity were a matter of the grammatical form of sentences, it would have to be the case that if p could not be true and q false then every pair of sentences expressing p and q would have to have grammatical forms that were logically valid. This seems highly improbable, given how rich and diverse languages can be. But if deductive validity is a matter of the form of *propositions*, and if (what

we saw Stebbing assert) each proposition has a unique form, then all that is required when p entails q is that the forms of the two *propositions*, p and q, constitute valid form when combined into an argument. This is not immediately improbable, though it is certainly contentious, as we shall now discuss.

3. Problems with the First Assumption: Does Each Proposition Have Just One Form?

The claim that consequence can be determined by formal validity is, again, the second assumption, to be discussed below. But even the claim that each proposition *has* a unique form, discoverable through analysis, is questionable, and was questioned in Stebbing's time. Stebbing was, as Michael Beaney reports, 'at the centre of the debate about the relationship between the Cambridge School and the Vienna Circle, which formed the two main traditions of analytic philosophy in the 1930s' (*Beaney 2003*, 339).³ One theme in these and related debates was whether there is such a thing as *the* form of a proposition.

Stebbing writes, as we saw, that 'the form of a proposition is what remains unchanged although the constituents of the proposition are altered' (*Stebbing 1948*, 126). This raises the question of what the constituents of a proposition are. Does the proposition expressed by the sentence 'Socrates is wise', for instance, have as constituents two terms, Socrates, wisdom, and a copula, as tradition had it?⁴ Does it, as W.V.O. Quine once suggested, have as constituents two *concepts*, the concept of *being Socrates* and that of *being wise*, to which some operator is applied (*Quine 1967*)? Or does it consist of a particular, Socrates, and a universal, wisdom? Again, the grammatical form of the

³ Some sources discussing Stebbing's views on analysis: *Milkov 2003*; *Beaney 2003*; *Janssen-Lauret 2017*, §5; *2021*.

⁴ Geach recounts and criticises the traditional view in its various forms (*Geach 1980*; *1962*).

sentence is little help here, since the same proposition, we take it, could be expressed by grammatically different sentences – ‘Wisdom obtains of Socrates’, ‘What socratises, is also wise’, etc.

Might this question might be settled by the analysis of sentences? In her 1933 lecture to the British Academy, Stebbing makes the important observation, which she believed G.E. Moore to have inadequately recognised, that ‘when we analyse a sentence expressing a proposition what we obtain is not another proposition but another expression’ (*Stebbing 1933*, 9). She then identifies four different types of analysis. These need not detain us; it is the fourth, which she calls ‘directional analysis’, that seems to have the best chance of identifying the form of a proposition. A directional analysis of a true sentence, ‘S’, produces a new sentence that ‘shows more clearly the structure of the fact expressed’ by the sentence. She goes on (*Stebbing 1933*, 32):

if the analysis were completed, the final resultant would have the same multiplicity as the fact expressed by “S” and by the resultant at each step. Thus the final resultant would reveal the form, the elements, and the mode of their combination.

It has been noted by several scholars that what Stebbing here calls ‘directional analysis’ corresponds to what she has earlier called ‘metaphysical analysis’ in ‘The Method of Analysis’ (*Beaney 2016*, 249; *Janssen-Lauret 2021*). In that earlier lecture, Stebbing refers to ‘the elements of the facts to which the [true] proposition refers’, as we saw (*Stebbing 1932*, 78). Thus if directional analysis produces a sentence with the same ‘multiplicity’ as the fact, revealing ‘the form, the elements, and the mode of their combination’, then it seems that directional analysis should produce a sentence with a grammatical form that matches the form of the proposition (and the fact, if the proposition is true). In this way we can use directional analysis to grasp the form of the proposition expressed by a sentence.

This opens a way to testing the first assumption. We can test the theory that each proposition has a unique form by observing the success or failure of directional analysis to display such forms. In a 1932 lecture to the Aristotelian Society, Max Black criticised Stebbing’s method of

what was then still called ‘metaphysical analysis’ in various ways (*Black 1932*). Stebbing analyses true propositions in terms of the *facts* to which they refer, but Black asks how we should then analyse false propositions (*Black 1932, 256*). Even in her later theory of directional analysis, as we saw, she proposes that the ‘final resultant’ of the analysis of a sentence, ‘S’, will have ‘the same multiplicity as the fact expressed by “S”’, and this is what reveals its form (*Stebbing 1933, 32*). So we can ask what happens if ‘S’ is false. Stebbing could reply that false sentences express *possible* facts – arrangements of objects that could obtain but do not. Black complains that ‘a possible fact is not a fact at all’ (*Black 1932, 256*). But this seems a superficial critique; we need only rewrite Stebbing’s explanations of analysis slightly to avoid it. Frederique Janssen-Lauret writes that Stebbing’s metaphysical or directional analysis: ‘is concerned to describe what kind of facts there are in the world if the sentence is true’ (*Janssen-Lauret 2021*). If the sentence *is* true, these will be actual facts, and if it is false they will be merely possible facts. Whether or not we admit possible facts as *facts*, so long as they are not nothing at all the disjunction seems clear enough, and Black’s criticism is not harmful to Stebbing’s account.

Black’s next critique concerns the question of whether Stebbing’s analyses preserve the meanings of analysed propositions (*Black 1932, 257*). As Beaney has argued, this appears to be decisively answered by Stebbing’s later and more elaborate distinction between types of analysis (*Beaney 2003, §§3-4; 2016, 251–52*). For our purposes, in any case, Black’s critique here is not relevant: the question is not whether a proposition can be analysed in a way that preserves its meaning but whether it can be analysed in a way that reveals a unique form. Another critique, by Eugene Bronstein, seems similarly irrelevant to our purposes. Bronstein challenges Stebbing’s distinctions between types of analysis, but he does not dispute the claim that analysis of some sort can reveal ‘the form of the fact, the elements of the fact, and the mode of combination of the elements of the fact’ (*Bronstein 1934, 13*).

But Bronstein raises another point, which seems more pertinent (*Bronstein 1934*, 13):

If we agree that we cannot refer to facts with perfect logical appropriateness but only with varying degrees of logical inappropriateness, why should we assert that in directional analysis ‘the final resultant would have the same multiplicity as the fact expressed by S and by the resultant at each step. Thus the final resultant would reveal the form, the elements and the mode of their combination?’

The relevance to our discussion is as follows. According to Stebbing, the method of directional analysis can identify the form of the proposition (and actual or possible fact) corresponding to a sentence, S, by analysing it to a new sentence that shows that form more clearly. Bronstein’s claim about ‘logical appropriateness’ seems to amount to the suggestion that no sentence can perfectly correspond to the form of the proposition.

If this is so – and Stebbing does not challenge Bronstein’s claim that we can only refer to propositions with varying degrees of inappropriateness (*Stebbing 1934a*) – the problem for the logical interventionist will be that it is impossible to precisely identify the forms of propositions, therefore of arguments. And so if deductive validity is a matter of the forms of propositions, we will not be able to decisively determine the validity of a given argument: a sentence might express a valid (or invalid) form without us being able to know that it does so. Stebbing’s reply on this point doesn’t help us out of our problem. She writes: ‘I can only say that I introduced the phrase ‘logically appropriate’ for the purpose of shewing how ordinary language may mislead us with regard to *logical* form. I was not there concerned with metaphysics’ (*Stebbing 1934a*, 36). This is puzzling because the logical form of a proposition, as Stebbing understands it, appears to be itself metaphysical, at least in the sense that it concerns the way in which objects are combined (at least in the case of true propositions).⁵ For example, she suggests that Socrates himself is the logical subject of the

⁵ Stebbing acknowledges that it takes work to determine what the objects constituting a proposition are; she discusses, for instance, Russell’s proposal that ordinary objects like tables are really ‘logical constructions’ out of sensory experiences in Appendix B of the *Modern Introduction* (*Stebbing 1948*, 502–5).

proposition expressed by the sentence ‘Socrates is wise’ (*Stebbing 1948*, §9.3, 153), so that the logical form of the proposition will somehow be Socrates’s combination with other constituents. In any case, if sentences are irreducibly ‘logically ambiguous’ – if we cannot decisively determine the logical forms of the propositions they express – then the fact that each proposition has a logical form will be of limited use for the logical interventionist. Everyday arguments, expressed in sentences, might amount to valid or invalid argument-forms without us being able to tell.

Certainly Stebbing acknowledges that it is not straightforward to extract the form of a proposition or argument from the sentence or sentences expressing it. In *Logic in Practice*, Stebbing notes that many arguments that might appear formally valid at the level of symbols are nevertheless invalid on account of ambiguities in the meaning of the symbols. She gives the example: ‘Of course Christians must seek peace, and not war. Christians are followers of Christ, and those who follow Christ certainly seek peace’ (*Stebbing 1934b*, 75). The argument looks formally valid if we read it as something like ‘Christians are followers of Christ, and all followers of Christ seek peace, therefore Christians seek peace’.⁶ But should we come across the argument in real life Stebbing notes (*Stebbing 1934b*, 75) that:

It is not at all unlikely that the middle term of this syllogism [‘followers of Christ’] is not used with the same reference in both premises; possibly, also, ‘Christians’ does not indicate in the conclusion what it was used to indicate in the premiss.

Earlier she states (*Stebbing 1934b*, 74) that:

If we were thinking *only about symbols* we could secure identity of reference, and thus freedom from ambiguity, by putting the right symbol in the right place. We should thus avoid undistributed middle, whilst [a symbol such as] ‘Y’ would appear in both premisses. But what looks like the same word may not have the same reference.

⁶ This looks like either a Barbara or a Darii syllogism, depending on whether the instances of ‘Christians’ are taken as particular or universal.

In itself, the sentence ‘Christians are followers of Christ, and those who follow Christ certainly seek peace’ may or may not express a compound proposition whose form involves *one and the same group* being Christians and seeking peace. It depends on the meanings of ‘followers of Christ’ and ‘those who follow Christ’, and these, Stebbing seems to be saying, can depend on context.

Moreover, Stebbing admits that knowing the meanings of the terms in a sentence cannot be reduced to any formal rules, even in a metalanguage (*Stebbing 1934b*, 77):

There are no *principles* which could guide us in avoiding ambiguity. Only in a context is a word ambiguous. That is why symbols – such as the X, Y, Z we have used – are unambiguous; they are cut free from a context. In this abstraction from a context lies the value of symbols in revealing the formal conditions; but therein lies also their limitation from the point of view of the material conditions of reasoning. The only advice that can be offered is to be on the look-out for ambiguities.⁷

This raises a challenge to the first assumption insofar as it raises the likelihood that certain terms in a given argument might remain irreducibly ambiguous – not fully resolved by semantic context – rendering it impossible to determine its unique form, supposing that it has one.

Finally, and most problematically for Stebbing, is that even if every sentence could be rendered without ambiguity, there are questions as to whether propositions themselves can be properly individuated. If they cannot be, then the very idea that a given sentence expresses a given proposition with a given logical form is incoherent. Janssen-Lauret points out the trouble that later philosophers – Ludwig Wittgenstein, Quine, and Susan Haack – found with the idea of ‘isolating individual statements and matching them with individual facts’ (*Janssen-Lauret 2017*, 13). These troubles cast doubt on the whole project of analysis as ‘uncovering the structure of facts, which are the referents of true sentences’ (*Janssen-Lauret 2017*, 13).

⁷ Similarly, Quine later explained that the ‘difficulty of establishing a mechanical routine for translating words into symbols’ is partly due to the existence of ‘ambiguous statements of ordinary language’ which ‘call for [a] sympathetic reading and an element of implicit psychologizing; and these are essential factors in translating words into rigorous symbolism’ (*Quine 1967*, 91).

Having said all of this, it is not even clear that Stebbing is wholeheartedly committed to the first assumption. Janssen-Lauret argues that in describing the project of analysis, Stebbing was aiming only ‘to set to set out the intellectual parameters of Moore and Russell’s conception of analysis, not to defend it’ (*Janssen-Lauret 2017*, 13). Moore and Russell were motivated by opposition to F.H. Bradley, who had claimed that reality ‘resists division into neat, individually cognisable chunks like facts or objects of singular reference’ (*Janssen-Lauret 2017*, 7). Whereas Moore and Russell set their teeth against this claim, Stebbing herself harboured ‘legitimate concerns for the idea that reality bottoms out into discrete, individually cognisable facts’ (*Janssen-Lauret 2017*, 15), favouring a more ‘foundherentist’ approach that has much in common with Quine and Haack.

Without going into detail about how Janssen-Lauret describes Stebbing’s foundherentism, there is enough here to suggest that Stebbing would not have accepted the first assumption without qualification. She might not have believed that each given argument possesses a unique and identifiable form, which the logician can then assess for validity. As such, we have motive to look for a way to understand her logical interventionism, without depending on this assumption.

4. Second Assumption: A given argument’s validity or invalidity can be determined by its form

Stebbing appears to endorse the second assumption at various points. In the *Modern Introduction*, she declares that ‘In order that the proposition q may be deduced, or formally inferred from p , there must be between p and q a relation such that q is a consequence of p ’ (*Stebbing 1948*, §12.2, 214-5). Later she explains logical consequence as *entailment*. One proposition, she holds, *entails* (*ent.*) another when the first cannot be true and the second false (*Stebbing 1948*, §12.2, 225):

We wish to maintain that if ‘ p *ent.* q ’ means ‘ p could not be true and q false’, then there is between p and q a relation such that q *follows logically*, or *formally* from p . No matter *what* p and q may be, if ‘ p *ent.* q ’ then q can be formally deduced from p .

Here Stebbing seems to align two conceptions of logical consequence: a semantic relation of entailment (p could not be true and q false) with a formal relation. When explaining her notion of entailment, she cites C.I. Lewis (*Stebbing 1948*, §12.2, 225) and later, in the *Modern Elementary Logic*, G.E. Moore (*Stebbing 1943*, 135).⁸ While Lewis's *Survey of Symbolic Logic*, which Stebbing consulted, does not identify entailment with formal consequence (Lewis 1918, 292), Moore seems to do so. First, he makes entailment a semantic relation of the same sort as Stebbing does: "In any possible world, a right angle must be an angle" is, I take it, just equivalent to " $(x) x$ is a right angle ent. x is an angle" (*Moore 1919*, 52). That is to say, ' p ent. q ' is equivalent to ' q holds in every possible world in which p holds'. But in the same lecture he defines 'ent.' as (*Moore 1919*, 54):

that relation which holds, for instance, between the two premisses of a syllogism in Barbara, taken as one conjunctive proposition, and the conclusion, equally whether the premisses be true or false; and which does not hold, for instance, between the proposition "Socrates was a man" and the proposition "Socrates was a mortal," even though it be in fact true that all men are mortal.

Here 'that relation' fails as a definite description.⁹ The conclusion of a syllogism is true in any possible world in which the *two* premisses are true, whereas it is not the case that 'Socrates was mortal' is true in any possible world in which only the one premise, 'Socrates was a man', is true. This then is one candidate for 'that relation' – namely, the relation between two propositions such that one is not false in any possible world in which the other is true. But the conclusion of a syllogism also follows *formally* from the two premisses, in formalised traditional syllogistic (and, for most moods, in standard first-order logic), and *this* relation also fails to hold between only the one premise, 'Socrates was a man', and the conclusion, 'Socrates was mortal'. Certainly Stebbing believes that syllogisms are formally valid (*Stebbing 1948*, §12.2). So 'that relation' could also be the relation of

⁸ For the profound lifelong influence of Moore on Stebbing, see Chapman 2013.

⁹ Ian Rumfitt discusses this point and its implications (*Rumfitt 2015*, ch. 2).

formal consequence. Failing to distinguish them, Moore suggests that he takes these two relations to be equivalent. And perhaps Stebbing, drawing upon Moore, also does so, thus: ‘No matter *what* p and q may be, if “ p ent. q ” then q can be formally deduced from p ’ (Stebbing 1948, 225).

At first this might seem highly implausible. In her dispute with Mercier, early in her career, Stebbing rebutted each of Mercier’s attempts to find a deductively valid argument that is not formally valid; each of his arguments, she showed, either implicitly instanced a syllogistic form or was not valid without a suppressed premise (Stebbing 1915; Chapman 2013, 32–33). But Mercier’s somewhat clumsy ventures are beside the point. Taking a simpler example from Steven Read (Read 1994a, 249), the proposition, ‘Iain is a bachelor’ entails, in Stebbing’s sense, ‘Iain is unmarried’: the first could not be true and the second false. The grammar of the sentences suggest the forms ‘ a is F ’ and ‘ a is G ’. But ‘ a is F , therefore a is G ’ does not look like a valid form. Here it is no help to speak of a suppressed premise, such as ‘all F s are G s’, since the *entailment* relation clearly holds between the two propositions on their own.

In 1935, Alfred Tarski presented a paper on logical consequence at a conference series of which Stebbing was an organiser (Stadler 2015, 172). The published version of his paper begins by criticising the belief of recent logicians that (Tarski 1956, 410):

Whenever a sentence follows from others, it can be obtained from them – so it was thought – in more or less complicated ways by means of the transformations prescribed by [formal] rules.

As John Etchemendy explains (Etchemendy 1999, 2):

Tarski begins his article by emphasizing the importance of the intuitive notion of consequence to the discipline of logic. He dryly notes that the introduction of this concept into the field ‘was not a matter of arbitrary decision on the part of this or that investigator’ (Tarski 1956, 409). The point is that when we give a precise account of this notion, we are not arbitrarily defining a new concept whose properties we then set out to study – as we are when we introduce, say, the concept of a group, or that of a real closed field. It is for this reason that Tarski takes as his

goal an account of consequence that remains faithful to the ordinary, intuitive concept from which we borrow the name.

But not only have Tarski's arguments that 'the formalized concept of consequence, as it is generally used by mathematical logicians, by no means coincides with the common concept' (*Tarski 1956*, 411) been widely accepted, Tarski's own attempts to precisify the intuitive concept have been declared at least a partial failure (*Etchemendy 1988; Read 1994b; Shapiro 1998; Etchemendy 1999; Dutilh Novaes 2005*). Read starkly concludes (*Read 1994a*, 264):

What must be acknowledged is that the belief that every valid argument is valid in virtue of a form is a myth, and exclusive concentration on the study of pure forms of argument does a disservice both to logic and to those who can be helped by it. Validity is a question of the impossibility of true premises and false conclusion for whatever reason, and there are arguments which are materially valid and where that reason is not purely logical.

One might infer from this that Stebbing's hope that formal validity can always track entailment – the impossibility of true premises and a false conclusion – belongs to a past era.

But before inferring this, however, we must remember that the forms relevant to logical consequence, for Stebbing, are those of *propositions*, not of sentences. And the forms of propositions are *combinations of the elements in the propositions*. Taking our case from above, 'Iain is a bachelor, therefore Iain is unmarried', the form of the first proposition might be *Iain belonging to a certain set*, and the form of the second, *Iain belonging to a superset of that set*. Then the consequence will be 'formal' after all, in the sense that it will be in virtue of the *forms* of the propositions – the arrangements of the real elements – that one cannot be true and the other false.

This brings us back to the question of the first assumption – does each proposition really have a unique, identifiable form? And, so far as logical interventionism is concerned, it must drive us to wonder how the logician can know these forms. Even if we accept that the form of a proposition is the configuration of elements, it is far from settled whether 'Iain is a bachelor' should be construed as the membership of a set by an element, or the inherence of a universal in a particular,

or a relation between two properties (one of which is misleading identified by a proper name), or any one of many other alternatives.

If we define formal consequence in terms of the forms of propositions in Stebbing's sense, where this means broadly the configuration of things, then it is hardly surprising that entailment should always be a matter of form. What is possible or impossible will surely always be in some sense a matter of the configuration of things. Read's point, in denying that entailment is always *formal* validity, is that deciding whether certain premises can be true and a conclusion false 'may be a complex issue in metaphysics, for example, or in mathematics' (Read 1994b, 264). Stebbing's definition of form is sufficiently broad that metaphysical and mathematical truths could be formal truths – truths about the possible combinations of objects. But Stebbing would then have reason to accept Read's conclusion, that 'the logician may need to go everywhere, into mathematics and even into metaphysics' in order to track entailments (Read 1994b, 264).

The upshot is that we might be able to interpret Stebbing's notion of formality broadly enough to sustain hope for a formal theory of consequence, even in light of post-Tarskian developments. But doing so will deal a serious blow to the idea of logical *expertise*. Nobody can attain to specialist knowledge of how the things we speak about – the constituents of the propositions expressed by our sentences, quite generally – can and cannot be configured. Stebbing herself possessed broad knowledge and versatile genius, ably commenting on physics (Stebbing 1944), history (Stebbing 1941a), contemporary politics (Stebbing 1941b), and a great many other topics.¹⁰ But her own ability to critically assess arguments in terms of a background knowledge of what is and is not possible in these domains is no evidence of the inherent ability of the *formal logician as such* to do so.

¹⁰ Chapman reports that Stebbing was reluctant to engage actively in politics, though she was called upon by others to do so (Chapman 2013, 121–22).

Moreover, the formal logician will not have any authority when it comes to extracting the forms of propositions underlying sentences. How the most ordinary propositions are to be *directionally* analysed involves the deepest questions of metaphysics. To know what proposition is expressed by ‘Socrates is wise’, we must know what objects must come together to make that true, and how. Since Quine, the distinction between metaphysics and the special sciences has been questioned, or as Quine put it, there has been ‘a blurring of the boundary between speculative metaphysics and natural science’ (Quine 1951, 20). Beyond this, anyone hoping to know the form of the proposition expressed by a sentence must resolve ambiguities, understanding what the terms in the sentence mean in the context in which they are used. This will involve knowledge of the particular idiolect of that particular context, and of the context itself. Again the logician cannot expect to have authoritative expertise here. Directional analysis would then have to be a collaborative and contentious enterprise, in which the formal logician as such can claim no special expertise. Thus even if we retain the second assumption in some way, we cannot sustain the original picture of logical interventionism, in which the logician is equipped to simply extract the form of a given argument and test it for validity.

5. Stebbing’s notion of *relevance*

What then are the resources in Stebbing to develop a modest conception of logical intervention, which does not depend on the two assumptions?

Here we might helpfully return to Stebbing’s repeated insistence on the importance of what she calls ‘relevance’. ‘To think logically’, she writes at one point, ‘is to think relevantly to the purpose that initiated the thinking’ (Stebbing 1941b, 11) – this is a candidate for the thesis-statement of *Thinking to Some Purpose*. A little later, she declares that ‘A distinguishing characteristic of intelligence is the ability to discern relevant connexions – to put together what ought to be conjoined and to

keep distinct what ought to be separated' (*Stebbing 1941b*, 24). A great deal of the rest of the book is devoted to pointing out instances where what *ought* to be separated is not kept distinct. Stebbing explains that 'ought', as she uses it, 'means "must, if rational."' This is the logical *ought*' (*Stebbing 1941b*, 24).

Many later examples in *Thinking to Some Purpose* are instances of thoughts that are connected *non-relevantly*. This is, in our view, a chief reason behind Stebbing's repeated insistence that thinking is an activity of the *whole personality*: 'We do not think with a part of ourself. Our thinking involves our whole personality. *How* I think is conditioned by the kind of person I am, whosoever 'I' may stand for' (*Stebbing 1941b*, 18–19). Because thinking involves our whole personality, we can be led from one thought to another not by any rational connections between them, but rather by prejudices, wishes, emotions, historical associations, and the like. Here we can find the beginnings of an explanation of how formal logic might connect with reasoning and arguing about everyday problems – one that does not depend on the two assumptions.

Most of *Thinking to Some Purpose* is devoted to examinations of various forms of what Stebbing clearly regards as improper thinking. In the *Modern Introduction* she takes a Dickensian example – one of Mrs. Nickleby's stream-of-consciousness speeches – and comments as follows (*Stebbing 1948*, 5–6):

An examination of Mrs. Nickleby's mental processes, as revealed in this passage, shows no sign of direction to an end. Clearly Mrs. Nickleby could observe, and she was able to recollect what she had observed. But her recollections were at the mercy of random associations; there is a connexion but it is the connexion of temporal contiguity. What happened is remembered and recorded *as* it happened. There is no selection, no omission under the influence of an explicit relevant interest. What she observes does not signify anything beyond itself; hence, its suggestive power is confined to what happened next, and then to what happened after that, and so on. There is no thinking here, for there is no direction to a conclusion.

Here the conclusion is very strong – Mrs. Nickleby is not thinking *at all*. But the distinguishing mark of this alleged non-thinking is a clue to how Stebbing regards the various sorts of bad thinking she criticises in her popular works. Again a central notion is that of *relevance*, which becomes somewhat clearer as Stebbing goes on (*Stebbing 1948*, 8):

We have seen that reflective thinking originates in a problem to be solved and is directed to its solution. Hence, reflective thinking has a natural end, the conclusion of the reflection. The various stages in this process are related to the conclusion as the grounds upon which it is based. These grounds may be called *premises*.

The reason Mrs. Nickleby's chatter fails to qualify as *thinking* is that it lacks logical connections among the component thoughts. Her thoughts are not *directed* towards an end because the earlier thoughts do not stand to later thoughts as premises to a conclusion. *Thinking to some purpose* means, roughly, thinking so that some of one's thoughts are rational consequences of others: so that one arrives at the 'conclusion of the reflection', i.e., a thought that is not only tokened as the psychological effect of tokening prior thoughts but also is the *rational consequence* of those prior thoughts. Stebbing puts this in terms of a theory of *inference*, which (*Stebbing 1948*, 211–12):

may be defined as a mental process in which a thinker passes from the apprehension of something given, the datum, to something, the conclusion, related in a certain way to the datum, and accepted only because the datum has been accepted.

Having understood this, we can interpret Stebbing's various warnings against biases of all sorts in *Thinking to Some Purpose* as explanations of various ways in which thoughts can run in series that lack rational connections. For instance, in her chapter on prejudices – 'A Mind in Blinkers' – she writes (*Stebbing 1941b*, 35):

'It is not emotion,' said André Malraux, 'that destroys a work of art, but the desire to demonstrate something.' I would say, somewhat similarly, that it is not emotion that annihilates the capacity to think clearly, but the urge to establish a conclusion in harmony with the emotion and regardless of the evidence. This urge is

incompatible with the impartial weighing of evidence which is an essential condition of ascertaining all the relevant facts and deducing conclusions from these facts alone.

In prejudiced thinking of this sort, the ‘conclusion’ will fail to be a genuine consequence of the premises – it will not be *relevant* to them. And so the connection of thoughts through the influence of prejudice will fail to track relations of consequence, entailment, relevance, or any relation of *inference*. Another example from her chapter on ‘potted thinking’ deals with phrases such as ‘milk-sop Christians’ (*Stebbing 1941b*, 59):

Such emotional language compresses into a phrase a personal reaction and an implicit judgment about a class of persons. To me at least it seems clear that their use results from potted thinking. Possibly I pay too high a compliment when I suggest that any thinking at all precedes their use. It may be that the notions expressed by one of these phrases have been associated together in such a way that the epithet has been tied to the noun it qualifies in a manner which makes it psychologically impossible for the speaker to think, for instance, of a Christian apart from the quality of being a milk-sop.

Here Stebbing seems to suggest that the connection of thoughts fails to be purposive – perhaps, like Mrs. Nickleby’s digressions, fails even to be thinking at all – because it is based on purely *psychological* relations. One thought might remind you of another without the second being inferred from the first; Stebbing distinguishes *inference* ‘from suggestion and recollection’ (*Stebbing 1948*, 211). It is possible to read much of *Thinking to Some Purpose* as a diagnosis of the various non-relevant ways in which thoughts can be connected by something other than a relation of inference. Throughout the book Stebbing finds newspaper articles and political speeches which begin with one thought and end with another, following a mere chain of psychological association. One thought prompts another through prejudicial association, by poor analogy, using tricks of language, by stirring up purely emotional reactions, etc.

Such thinking is not relevant thinking, in Stebbing’s judgment. It is not directed to a purpose by way of rational connectedness. Rather than ‘keeping distinct what ought to be separated’ it

connects it. Someone who agrees with the one is led to agree with the other, though rationally she ought not to be so led. This bad thinking can serve a purpose – Stebbing admits, for instance, that Oswald Mosley’s offensive anti-Semitic language well served his purpose ‘to stir people to action by arousing or fomenting hatred’ (*Stebbing 1941b*, 48). But it is not thinking *to* a purpose; it does not direct thinking from some thoughts to others – or perhaps, if the reasoning is practical, from some thoughts to actions – by way of inference.

We have seen here that relevance, a notion that Stebbing does not define in terms of logical form, is used as the basis for critique of the rationality of purported arguments – showing what propositions ought not be conjoined. Thus Stebbing’s sense of rational connection of thought is much broader than the purely formal. The question is then what intervention the formal logician can usefully make in instances where such rational connection is in question.

6. Stebbing’s modest, dialogical interventionism

Our answer will entail that logical intervention is possible, but we must surrender the logician-as-umpire model. Logical intervention works, rather, through dialogue and collaboration between the logician and others.

Our original question was: how can logic be at once a formal science, *and* be instructive for everyday thinking? The proposed answer is as follows. What ought to be separated – that is, the thoughts linked together in *irrelevant* thinking – is conversely what ought *not* to be conjoined. Insofar as the logician knows about *what ought to be conjoined* – that is, thoughts which are *relevantly* connected – she has an identifiable role in treating the various pathologies Stebbing diagnoses in *Thinking to Some Purpose* and similar works, such as *Logic in Practice*. But how can the logician know about *what ought to be conjoined*, when, as we have just seen, this is not simply a matter of logical form, which comprises the logician’s specialisation?

We can see the problem clearly by noting that the relation of *inference*, which Stebbing regards as the mark of relevant thinking, is broader than deduction in general. As she explains (*Stebbing 1941b*, 212):

...inference is the mental process in which a thinker passes from one or more propositions to some other proposition connected with the former in a certain way. As thus defined 'infer' is not equivalent to 'deduce'. These words have been used by some logicians as synonyms. But the correct synonym of 'deduce' is 'formally infer'. The word 'inference' is correctly used in a sense wide enough to include not only *deduction* or *formal inference*, but also any passage from a *datum*, A, to a *conclusion*, B.

We can recognise generally accepted forms of inference besides deduction. There are inductive inferences, which Stebbing treats as irreducible to deductions (*Stebbing 1948*, ch.21, §4; *1943*, 166).

There are what Charles Sanders Peirce called 'abductive' inferences – inferences to the best explanation. Peirce regarded these as part of formal logic (*Peirce 1934*, 5:189), but others have argued they belong to a class of non-deductive inferences, one that might admit of a variety of other forms.¹¹ There is no reason to assume that the formal logician should be expert on these. Stebbing herself wrote that 'not all relevance is logical' (*Stebbing 1948*, §24.1, 468). Thus we must ask, again, why the formal logician should be particularly qualified to intervene in judging thinking, as such.

In answering, we should first reflect that psychological associations are not ordinarily confused for chains of inference. When an old song makes me think of a distant lover, I do not suppose that I have logically concluded the lover from the song. It is only in certain cases where the psychological prompt that leads from one thought to another is mistaken for an inference. Should it not perhaps be the expert psychologist who determines when such a mistake is occurring? But there must be some sort of illusion that fosters the mistake in these cases: that of mistaking the

¹¹ A useful discussion is provided by Godfrey-Smith *2003*, 42–44.

psychological for the logical ‘must’. The psychologist, or any other expert, could be equally prone to falling for the illusion, if it is a powerful one.

The logician will be similarly prone. But her knowledge of logical forms gives her an advantage. Even if not all types of valid inference are reducible to logical forms, and even if it is not always straightforward matter to extract the form of an argument, the logician can be specially protected against illusions of logical relatedness by having at least a heuristic test for validity. She can take the putative argument and see if it at least *appears* to instance a form that is a theorem of some accepted formal system. If it fails to so appear, this does not show that it is not a valid inference, for all the reasons we have seen. But then there are three possibilities. Perhaps there is no inference at all – the psychological association of ideas merely gives the *illusion* of being ‘thinking’ in Stebbing’s sense. Perhaps it is an invalid inference: an inference of non-‘relevant’ thinking. Or perhaps it instances a type of validity – ‘relevance’ – not visible to the logician. Systematically presenting these possibilities might bring some new clarity to the person considering the association.

For instance, suppose the presented association runs: ‘Jones is a Christian; he is thus a soft-hearted milksop’. The logician might make this appear to instance a valid syllogism by supplying the extra premise ‘all Christians are soft-hearted milksops’. But anyone directly considering this premise will notice its implausibility; counterexamples abound unless ‘Christian’ is being used in some *ad hoc* or question-begging way. The logician can then try again with different forms and putative tacit premises. But if she can find no obvious candidate for a valid form instanced by the association, the burden falls back on the person presenting it to give reasons for claiming to *infer* the conclusion from the premise. For the reasons we have examined, the failure to present a valid form does not warrant the conclusion that the argument is not validly inferred. However, if the dialogue has gone for a while, a good deal of scepticism might have been aroused in those considering the association. Having witnessed the logician’s good-faith efforts to find some logical form validating the inference,

they might end up finding it more probable that the association is merely psychological and not inferential – a case of non-thinking or at least of non-relevant thinking. Combing finely over the logical forms that the association might instance provokes attention to it that might be enough to advance the discussion by exposing its misleading or even malicious character.

It is not that the logician herself is specially qualified to detect such a character. Nevertheless, she has a special skill or know-how in *framing the dialogue*.¹² Suppose that the logician renders the putative argument about Jones the Christian in the form given. If those who were convinced by the proposed argument accept that the premise ‘Most Christians are soft-hearted milksops’ is necessary to validate it, they can be challenged to present data to support such a claim. They might, perhaps at the logician’s suggestion, accept a weaker premise and accordingly weaken their conclusion: ‘I suppose I think that *many* Christians are soft-hearted milksops, and so I meant that Jones, as a Christian, is likely to be soft-hearted’. Or, perhaps being instructed by the logician that entailment is not always captured by form, take the offered way out: ‘*You* can’t see how it’s not possible for somebody to be a Christian without being a soft-hearted milksop – there is no logical form that explains this, but a proper expert in the matter will understand the impossibility’. But then it will be open to others to request that they demonstrate and explain this expertise. Or, finally, they might simply say to the logician: ‘Stop! I realise now that I was making my judgement on the basis of a psychological association, not a valid empirical generalisation’. In any case, the logician has contributed to a public process of weighing the matter, though she has not weighed it *on her own*.

This appears to match Stebbing’s own practice of intervention, at least in some cases. For example, in *Ideals and Illusions* she takes a sentence from one of Benito Mussolini’s speeches: ‘war alone brings up to their highest tension all human energies and puts the stamp of nobility upon the

¹² This version of logical interventionism is thus consistent with the dialogic conception of logic and reasoning that has been promoted in recent literature (*Sperber and Mercier* 2017; *Dutilh Novaes* 2020).

peoples who have the courage to meet it'. She then replaces terms to produce the extensionally equivalent sentence (*Stebbing 1941a*, 164):

Human beings who are engaged in an organized effort to kill, wound starve, or otherwise injure other human beings organized in the same way for the same sort of purpose will have all their specifically human energies raised to the highest tension, and this organized effort to kill, wound, starve, or otherwise injure other sets of human beings, similarly engaged, is admittedly noble if these human beings thus organized to kill, wound or otherwise injure other sets of human beings, similarly organized, meet with courage the organized efforts of the second set of human beings to kill, wound, starve, or otherwise injure them.

The second sentence sounds much less plausible, on the face of it, than the first. Stebbing nowhere claims that it is *invalid* or *illogical* for somebody to accept the first sentence and not the second. After all, it is not always true that co-extensional terms can be exchanged without changing the meaning of a sentence. There is no guarantee that the two sentences will express the same proposition nor any algorithm for determining the forms of the propositions. What Stebbing tells us, however, is that (*Stebbing 1941a*, 163):

If a sentence in which the main word is translated into an equivalent sentence in which this word is replaced by corresponding less abstract words, and if the new sentence thus obtained would be dissented from (or assented to) by someone who had formerly assented to (or dissented from) the original sentence, then the use of the abstract word in the original sentence was harmful.

It is not for the logician to decide that the justification given for the original sentence is illegitimate if it fails to justify the new sentence, nor that an argument using the original sentence as a premise is invalid if an argument using the new one is. This might, after all, be a context in which co-extensive terms are not harmlessly interchangeable. But changing the terms is a helpful *experiment*. Those who had assented to the original sentence might, if they dissent from the new one, reflect that they had been deceived by the emotive or rhetorical force of certain terms. This could happen if this turns out *not* to be a context in which exchanging co-extensive terms is expected to make a difference. It is up to those who know the linguistic context to decide on this; once the experiment is made only

they can decide on its ultimate results. Still, the logician has used her expertise to *frame* the experiment. Somebody trained in formal logic is far more likely to think of exchanging co-extensional terms, and to know how to do so properly, than somebody not so trained; Chapman points out that ‘Stebbing’s proposal to “translate” [Mussolini’s sentence] owes much to her background in logical analysis, going right back through Cambridge analysis to Russell and his attempts to dispense with troublesome linguistic elements such as definite descriptions’ (*Chapman 2013*, 153). So here again is a case where the formal logician, *qua* formal logician, makes a unique contribution to a process of judging the validity of a certain sort of public argument.

The crucial point here is that the logician’s contribution to public argument occurs only *in dialogue* with non-logicians. The mere testing and manipulation of forms does not decide the case, but it can lead the public to consider what it was that made the putative argument seem compelling. The public can then bring in its understanding of psychology, of scientific method, and of all the other broad forms of understanding involved in interrogating the rhetoric of politicians, journalists, and others who present associations of thought in the guise of logical arguments. Proper criticism will always depend on the public’s possession of a wide range of critical skills, going far beyond the specialised skill of the logician. Nevertheless, the logician can guide the public in directing those critical skills effectively to the purpose at hand.

This, we propose, is the modest role Stebbing saw for herself as a logical interventionist: a trained logician attempting to help the public think critically about the vast volume of often manipulative rhetoric we are routinely fed.¹³ She could use her expertise in the assessment of logical forms to give useful systematicity and direction to public criticism. Her arguments suggest that thinking to some purpose is a collaborative and dialogical exercise in which the logician’s role is

¹³ Jane Duran argues for the ongoing relevance of Stebbing’s work in this regard (*Duran 2019*).

unique and indispensable. Without making the two assumptions we began with, it is difficult to justify the belief that the logician can use her knowledge of form to judge the validity or invalidity of any argument, simply by examining the words in which the argument is made. That is to say, it is difficult to justify the picture of the logician as a reliable umpire of arguments. But we have argued that Stebbing has the resources to commit to a more modest conception of logical interventionism, in which the logician is party to a dialogue about validity rather than being an authoritative umpire. This requires no commitment to the two assumptions – a commitment that, we have seen, Stebbing might not have even made.

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