Normative Logic and Psychology: Peirce on Dewey
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1. Peirce's response to Dewey's logic

> There are three sciences according to me to which Logic ought to appeal for principles, because they do not depend upon Logic. They are Mathematics, Phenomenology, and Ethics. There are several sciences to which logicians often make appeal by arguments which would be circular if they rose to the degree of correctness necessary to that kind of fallacy. They are Metaphysical Philosophy, Psychology, Linguistics … History etc. (Charles Sanders Peirce in a letter to John Dewey, April 1905. CP8.242)[1]

This essay explores two episodes in the history of a continuing debate about whether logic and epistemology can draw on information from psychology, history, biology and other special sciences, or whether logic must be the 'pure' study of a priori knowable, necessary laws of possible thought. The first episode involves Hermann Lötze and John Dewey. The former was a rationalist, a champion of *pure logic* who insisted that logic and psychology must be sharply separated; and the latter, in a series of four papers, subjected Lötze's views to relentless criticism, advocating the view that logic was the 'natural history of thought'; and proposing a rapprochement between logic and psychology. It is

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[1] Peirce's choice of Metaphysics, Psychology, Linguistics and History as examples of disciplines that Logicians often (and fallaciously) makes sense when we notice that they are the fourth, fifth, sixth, eighth and eleventh of thirteen different methods that are employed in logic in part of the first chapter of his unpublished *Minute Logic* (CP 2.18-78). His evaluations of some of them will be discussed in section five below.

through Dewey's work that pragmatism has come to be associated with the naturalistic view that there are no discontinuities between philosophical disciplines like logic and the natural sciences.

The second episode involves Dewey and his fellow pragmatist Charles Sanders Peirce. The passage quoted above is part of Peirce's response to Dewey's four papers. While acknowledging that Lötze's own account of logic could not be defended, he insisted that what he called 'normative logic' (CP 8.190) was wholly independent of, for example, psychology, metaphysics, linguistics and history. Moreover, he claimed that Dewey's view of logic as 'the natural history of thought' (CP8.190) was a recipe for 'render[ing] the laws of reasoning lax' and a 'debauch of loose reasoning' (CP8.240). Warming to his theme, he added that the work of Dewey and his students was 'penetrated with this spirit of intellectual licentiousness that does not see that anything is so very false.' (CP8.241) The debate between pure logic and what might be called call 'naturalistic logic' thus surfaces within the ranks of the pragmatists.

My primary interest is in the second episode, and the discussion of Dewey's response to Lötze is included to provide a context for his embracing of a naturalistic approach to logic. Peirce's response to Dewey is interesting for several reasons. First, there is some intrinsic interest in understanding the differences between the positions of the classical pragmatists, and comparison can help us to understand their contrasting views. This is particularly important because it was evident that Dewey did not anticipate Peirce's antipathy to his positions. Second, as Peirce's rhetoric may suggest, there appear to be parallels with contemporary attacks upon neo-pragmatists such as Richard Rorty. Third, the distinction between those disciplines that depend upon logic and those that are free of such dependence is extremely important in Peirce's work after around 1902.

Peirce's claim that logic should draw its principles from disciplines that do not depend upon logic, and his diagnoses of the problems we face if we allow logic to depend upon psychology and other special sciences, are given an important role in his attempts to write a logic text, *The Minute Logic*. In manuscripts from 1902 and later, Peirce provided a detailed system of architectonic, a map of our knowledge which identifies mathematics, phenomenology, aesthetics and ethics as disciplines which can be used in constructing our logical theories (See EP2: 258-62, Short 2007: 6105, Kent 1987: passim). He also provided a systematic account of the different branches of logic in order to show how logical knowledge was possible and to show how it can be employed in carrying out inquiries effectively and responsibly. In subsequent years, he sought for a defence of his pragmatist maxim which suited its standing as a logical or methodological principle. Its correctness was to be established without relying upon 'principles' or 'data' drawn from psychology, linguistics, history and the other disciplines that depend upon logic. This means that when we try to understand and evaluate Peirce's criticisms of Dewey's new logic, we have to engage with doctrines that are fundamental to his philosophical concerns in the first decade of the twentieth century.

The paper begins by introducing Lötze's rationalist approach to logic (section 2) and nature of Dewey's 'instrumentalist' or naturalistic response to it (section 3). The remainder of the paper explores Peirce's criticisms of Dewey. We begin by reviewing Peirce's criticisms (section 4), and then identify Peirce's fundamental reasons for denying that normative logic can draw on information from psychology and other special sciences (section 5). We then try to evaluate Peirce's criticisms (section 6) and outline Peirce's positive proposals about how a normative logic is possible (section 7). In the remainder of this introductory section, we shall explain some of the context of Peirce's response to Dewey, and

clarify a concept which has an important role here, the concept of logic.

Dewey had sent Peirce a copy of *Studies in Logical Theory* (1903), a collection of essays by his students in Chicago. As intimated above, Dewey himself had contribute four essays to the collection in which he attacked Hermann Lötze's influential endorsement of 'pure logic', of a logical theory that made no use of information from psychology and the other special sciences at all. Logical laws had to be a priori knowable, self-evident necessary truths. Instead Dewey advocated that logical theory should be developed as a 'natural history of thought', which would rely upon ideas from evolutionary biology and psychology. We have two sources of information about Peirce's reaction to it. In June 1904, he wrote a letter whose tone was sympathetic to what Dewey was achieving but also expressed anxieties about his approach to logic (CP8. 239-242).; and he also published a review in *The Nation* (CP8.188-190) which developed further these criticisms of Dewey's 'conception of the business of the logician'. (CP8.188) There is a later letter to Dewey, dated April 1905 and probably not sent. This is a response to a letter from Dewey expressing his admiration of Peirce's paper 'What pragmatism is', and it is harsher in its criticisms, expressing surprise at Dewey's admiration because *Studies in Logical Theory* 'certainly forbids all such researches as those which I have been absorbed in for the last eighteen years.' (CP8.243).[2] Peirce evidently saw Dewey's conception of logic as dramatically different from his own, although the differences may not have been obvious to the latter.

The use of the word 'logic' in the writings of both Lötze and Dewey may strike some readers as unusual. Following nineteenth century practice, Dewey uses 'logic' for the study of how we employ normative standards in solving problems and settling beliefs; it identifies norms for the conduct of inquiry and standards employed

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[2] The quotation at the beginning of this paper is taken from this second letter.

for determining whether beliefs are justified, and so on. Many of the discussions cover topics closer to those which are currently treated under such titles as 'theory of knowledge', 'philosophy of science' and 'epistemology'. Moreover, just as 'logic' has a contemporary usage which differs from that most often found in writings from, say, the late 1800s, the same holds for expressions like 'theory of knowledge' and 'epistemology'. David Sullivan has remarked that in the second half of the nineteenth century, 'theory of knowledge' was part of empirical psychology and not a discipline that engaged with normative matters (2008). And Dewey used 'epistemology' as a name for a discipline which engaged with abstract metaphysical issues about how far thought-as-such adequately corresponded to reality-as-such, issues which Dewey described as 'metaphysical in the bad sense'. A version of metaphysical realism which allowed for the intelligibility of a sceptical gap between thought and reality would, I suggest, be called 'epistemological' by Dewey because it requires us to engage with the epistemological problem. Sometimes I shall follow Peirce, Lötze, and Dewey in talking about 'logic', and sometimes I shall talk more generally about theory of inquiry. But I shall generally assume that nothing turns on which terminology is actually 'correct'.

2. Dewey and Lötze

Dewey's four contributions to *Studies in Logical Theory* all have a title beginning 'Thought and its subject matter', a subtitle indicating its primary topic. The first, with the subtitle 'The general problem of logical theory' provides the background to Peirce's comments. It tries to explain how the need for logical theory arises; it describes two different approaches to the construction of a logical theory, and it begins to make a case for favouring one of the two. The general problem is easily formulated on the first page. It concerns 'the relation of thought to its empirical antecedents and to its consequent, truth, and the relation of truth and reality.' (1903: 1)

And he continues to ask when (or why) we need a theory that solves this problem.

Most of us, much of the time, take up the 'naïve point of view', holding that 'thinking is an activity which we perform at specific need, just as at other needs we engage in other kinds of activity.' We normally have no need to think actively about how to think and about the relations of truth and reality. Most of us make no use of the sorts of theories encountered in logic books. The need for a theory arises mainly when ''circumstances require the act of thinking and nevertheless impede clear and coherent thinking in detail; or when they occasion thought and then prevent the results of thinking from exercising directive influence upon the immediate concerns of life'. (1903: 4) In other words, we only look for a *theory* of thinking when our practice of thinking and our various cognitive and practical presents us with problems: our practice loses its familiar 'organic character'. When we seek a logical theory, we find ourselves asking questions that are significantly different from those that are addressed in ordinary scientific and everyday reasoning. practical deliberations and scientific research. When we seek a theory of reasoning, we want something *general*. We then abandon the naïve assumption that reasoning is always concerned with specific purposes and specific circumstances. When we ask questions about 'the relation of truth and reality' we abstract from all that is particular and specific in our reasoning and deliberations. The problem for logical theory is to show how we can abstract from the specificities of particular cases and think about these very general issues.

For present purposes, we can grant that a logical theory involves general principles or generalisations that we seek because we need to understand how we should carry out inquiries and make distinctive kinds of evaluations of our beliefs, and investigations, or because we face challenging problems when we engage in such activities. Dewey, Lotze and also Peirce could probably accept this

formulation, although the details of their theories would be very different. We can identify a number of respects in which the views of Dewey and Lötze were in contrast.

Lötze's treatise on Logic was tellingly divided into three parts: 'Pure logic', 'Applied logic', and 'On Knowledge (Methodology)'. Logic could be *applied* to the solution of problems about how we should conduct inquiries and about the evaluation of beliefs. But pure logic said nothing about psychological states such as beliefs or activities such as inquiries; instead, it is devoted to 'thought ingeneral and those universal forms and principle of thought which hold good eveyrwhere, both in judging of reality and in weighing possibility , irrespective of any difference in the objects' (Lötze 1888: 10-11). The three sections of his discussion of pure logic are devoted to concepts, judgments, and inferences respectively. And in classifying the different kinds of concept, judgment, and inference, it treats them as '*ideal* forms, which give the matter of our ideas, if we succeed in arranging it under them, its true logical setting.' (ibid: 11) Applying these ideal forms to concrete investigations with specific subject matters is a messy business: the peculiarities of particular subject matters 'offer resistance to this arrangement' under the ideal forms. And 'applied logic is concerned with those methods of *investigation* which obviate these defects. It considers hindrances and the devices by which they may be overcome; and it must sacrifice the love of systematisation to considerations of utility, and select what the experience of science has so far shown to be important and fruitful.' (ibid)

Lötze's approach to logic thus has a two stage character. Pure logic provides us with *a priori* knowledge of ideal forms that reveal the nature of concepts, judgements, and inferences. These forms can then, with difficulty, be applied to concrete cases. In identifying these ideal forms, it abstracts from all empirical information about particular investigations and particular subject matters. We need such information when we apply logic to provide guidance in our

reasoning and investigations; but it is of no relevance to the study of the ideal subject matter of pure logic. It is thus a mark of the purity of logic that it is independent of psychology (1888: 10): when doing pure logic we can ignore the psychological processes that are presumably involved in ordinary reasoning. Logic's starting point is simply that 'between combinations of ideas, however they may have originated, there is a difference of truth and untruth, and that there are forms to which these combinations *ought* to answer and laws which they *ought* to obey' (ref). Information about the genesis of our ideas is irrelevant to pure logic.

In order to avoid relativism and scepticism, he thought, we need necessary laws of thought. Our knowledge of such laws is grounded in 'intuition', a faculty that reveals to us self-evident truths. Indeed, logic and other areas of knowledge rely upon *axioms* of which we have self-evident knowledge. In constructing logical concepts and identifying logic laws, we can rely upon a system of categories (roughly of things, properties and relations), which is reflected in the grammatical categories of 'substantive', 'adjective' and 'verb'. This presumably ensures that the logical laws will be abstract, as general as is possible, and minimally dependent upon the specificities of particular thoughts and inquiries.

How does this all work? Presumably, in identifying these laws, Lötze would reflect upon our ordinary practices of thinking and reflecting; the subjective psychological processes involved in arriving at them may be complex. But to regard these reflections and processes as relevant to the justification of these laws would be to succumb to a psychologistic error. Once these processes have been completed, the normative standing of our acceptance of these laws is determined by their self-evidence. There is nothing further to say about *why* we are right to accept them and *how* they are self-evident. Lötze's general account of justification is broadly coherentist: in ordinary investigations, we begin with our simple subjective sensations, we reocgnize that the patterns among them

can be distinguished into those that are 'coincident' and those that display coherence. When we think, we try to carry out procedures designed to identify and preserve coherence. Once we try to use these ideas to relate 'though-as-such to 'reality-as-such', it becomes open to charges of vicious circularity. Lötze's response that 'The circle is inevitable, so we had better perpetrate it with our eyes open' does not inspire confidence.

This provides the context for Dewey's defence of his view of logic. He tells us that 'the very nature of logical theory as generalisation of the reflective process must of necessity disregard the matter of particular conditions and particular results as irrelevant'. Since logic studies the relations of 'thought as such' to 'reality as such', it seeks abstract and very general formulations. Dewey associates this view of things with Lötze who holds that 'pure logic' is concerned with 'universal forms and principles of thought which hold good everywhere both in judging reality and in weighing possibility, *irrespective of any difference in the objects*'. (1903: 6).

Logical theory is concerned with 'thought as such – thought at large or in general'. And it asks 'how far the most complete structure of thought ... can claim to be an adequate account of that which we seem compelled to assume as the object and occasion of our ideas.' (Lötze). It provides a general abstract account of thought, truth, reference etc, and it engages with our ordinary practical and scientific deliberations by, like any abstract scientific theory, being *applied to* concrete circumstances. But these circumstances, and the differences between the objects of different thoughts, can be safely ignored while we are doing *pure logic*. So logic achieves generality by dealing with universal abstract laws and principles that are binding upon *all possible* thought and inference. These can be *applied* to particular cases, and this can help us in dealing with problems. 'The entire procedure of practical deliberation and of concrete scientific research' is thus irrelevant to the project of pure logical theory.

Dewey describes this sort of approach to logic as 'epistemological', because it entailed that the fundamental problem of logical theory was to explain 'the eternal nature of thought and its eternal validity in relation to an eternal reality' (ref). As Dykhuizen put it, the kind of logic that Dewey rejects holds that 'the function of thought is to represent reality and that the truth of an idea depends upon how faithfully it does this. (1973: 84). The justification for describing such theories as 'epistemological' is that once we give a very abstract account of thought and reasoning, one which ignores the specificities of particular episodes of reasoning, we find ourselves facing sceptical questions: what reason have we to think that processes if thought described in these abstract terms can provide us with knowledge of reality. Such logics force us to confront fundamental epistemological problems. These concern the relations between thought-as-such and reality-as-such. This becomes clear in Dewey's second essay, where he describes Lötze's account of the materials of inquiry and the circumstances in which we inquiry. It is indeed cast in very abstract terms. The 'ultimate material antecedents of thought are found in impressions which are due to external objects as stimuli: an impression is nothing but 'a state of our consciousness, a mood of ourselves' Inquirers then examine patterns which are sometimes 'coincident' and at other times 'coherent'; and the aim of reasoning is to 'recover and confirm the coherent, the really connected, adding to its reinstatement an accessory justifying notion of the real ground of coherence, while it eliminates the coincident as such.' (1916 108-110ff). This ignores all that is specific to any particular inquiry but, at the same time, captures a common form that fits all. Dewey is scornful of Lötze's attempt to somehow get from the impression, which is subjective, to its real ground.

So why does Dewey reject Lötze's conception of pure logic? There are two considerations which are, roughly speaking, epistemological. First, as we have seen above, Lötze's conception of

self-evidence may be problematic: it is not easy to see why self evident laws should be true. And second, Lötze's own system of logic is 'epistemological': it gives rise to problems about whether our judgments match reality which, according to Lötze's critics, were unanswerable.[3]

Dewey proposed that we consider a different way of 'stating the problem of logical theory.' The key idea is that, while a general theory will have to abstract from 'much of the specific material and contents of thought situations of daily life and critical science', it can still identify '*certain* specific conditions and factors, and aim to bring them to clear consciousness.' It seems to be an empirical investigation which tries to identify the features that are common to circumstances that prompt inquiry, to 'show how typical features in specific circumstances of thought call out to diverse typical modes of though-reaction', and it can 'attempt to state the nature of the specific consequences in which thought fulfils its career.' (7) We begin with particular cases, and then identify patterns involving *kinds* of particular cases whose laws can be used to deal with the problems that first give rise to the search for a logic theory. The best way for Dewey to argue against pure logic is to develop his alternative and show that it meets all our needs from a logical theory. The success of an impure alternative would show that we are justified in ignoring pure logic even if we cannot show that it is impossible.

So there are two big differences between Lötzean logic and Dewey's logic. The former seeks *complete* generality, it seeks to abstract from all and any of the specific features of reasoning and find laws that govern *all possible kinds* of reasoning and inquiry. And his version of such a theory forces him to confront sceptical problems. Dewey, by contrast, seeks a kind of generality which is

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[3] Peirce complained to Dewey: 'Your reasoning generally is that either Lotze or you must be right, now Lötze isn't, etc.' (CP 8.244). Peirce himself was convinced that there was at least one alternative to both Dewey's and Lötze's, namely the version of pure logic that Peirce himself defended.

intermediate between this complete generality and a study of thought which focuses on the particular case and their idiosyncrasies. The problems that spur us to seek a logical theory occur in particular contexts, and it is not obvious that their solution requires a theory that deals with all possible thought. Awareness of the problems that give rise to the search for a logical theory can guide us in formulating laws governing particular kinds of inquiry, or inquiries that share distinctive salient features. We now turn to how Dewey attempts to develop such a logical theory and then to understand why Peirce rejected it.

3. Dewey's instrumental logic.

In this section, we shall identify some important characteristics of Dewey's new 'instrumental logic', some features show how different it is from Lötze's version of pure logic. First, it grows out of what Dewey calls 'naïve inquiry' and emphasises the continuities between everyday common sense reasoning and the more reflective and methodologically sophisticated practices we associate with scientific inquiry. Reflection does require us to formulate generalisations and may require a logical *theory*. But rather than taking these generalisations from a body of necessary truths that are independent of any of the specificities of inquiry, it formulates generalisations that are relevant to the particular problems that we face. As Dewey puts it, logic 'may strive to hit upon the common denominator in the various situations which are antecedent or primary to thought and which evoke it.' It responds to 'typical features in the specific antecedents of thought' which are relevant to particular 'thought –reactions'. Inquiry takes on a logical cast by deepening the sorts of reflections we are already familiar with rather than by appealing to a logic which is prior to inquiry.

Second, he argues that we shall obtain a better understanding of the problems of logical theory if we recognize that 'every scientific inquiry passes historically through at least four stages.'

Initially, there is no inquiry because we face no real problem. Then, once a problem arises, we spend some time seeking out and examining 'relatively crude and unorganized facts'. This is followed by a period of speculation in which we make hypotheses, draw distinctions and make classifications. This facilitates a period of 'fruitful interaction between the mere ideas and the mere facts'. Our observations may depend upon experiment and they are directed by our hypotheses and other ideas. He was to complicate this story subsequently. What is important is that we focus upon an historical process, one that 'advances from unanalyzed experience, through seeming facts and doubtful ideas, to a world continually growing in definiteness, order and luminosity.' Reasoning and inquiry is a distinctive historical process and we best understand it by identifying its stages and understanding their functions. Dewey concludes from this that logic 'follows the natural history of thinking as a life process having its own generating antecedents and stimuli, it sown states and career'. And since 'the whole industry of the psychologist is with natural history', Dewey's logic enables him to turn his back on Lötze's anti-psychologicism, logic can 'make peace' with psychology. Psychology, so understood, learns from Darwin, identifying the functions of different structures, and showing how they enable us to achieve our goals in inquiry.

Two important issues, much discussed by Lötze, are placed in a different light within Dewey's new instrumentalist logic. One source of the epistemological problems that troubled Lötze's logic was its concern with the relations between 'thought-as-such' and 'reality-as-such'. There is a sharp dichotomy between thoughts and the facts and hence we had to be able to show how thought can lead us to reliable information about the facts. For Dewey the distinction between thought and fact is not an 'ontological' one. Our familiar distinction between facts and ideas is to be understood in terms of the structure of inquiry: there are established, unquestioned facts that are not matters for further inquiry and that

provide information for testing more uncertain matters; and there are conjectures which are entertained in a more tentative way, and whose fate will depend upon the progress of experimental testing. The natural history of thinking explains our familiar distinction here without introducing a metaphysical dichotomy.

4. Peirce's criticisms of Dewey's Logic

We are now ready to examine Peirce's criticisms of Dewey's approach to logic in more detail. This will occupy the final three sections of the paper. In the present section, our main focus will be with those passages from Peirce's review and his letters to Dewey in which he identifies the supposedly calamitous consequences of Dewey's logic. In section five, we take this further, examining Peirce's reason for thinking that any approach to logic which draws on information from psychology and the other special sciences will fail. Finally, in section 6, we consider Peirce's claims about the intellectual resources that are available for constructing the kind of normative logical theory that he favours.

Let us now list some of the criticisms that Peirce made both in his review and in his letters to Dewey, beginning with those we find in the (brief) review. The issue that Peirce addresses concerns the resources that are available for people working in a particular scientific specialism for evaluating and developing the methods they employ on their inquiries. He distinguishes what we can call 'internal criticism' from 'external criticisms'. The former involves regulating particular methods and procedures within a discipline in the light of standards which are already endorsed within the discipline in question: critical revision of methods involves a kind of fine tuning. External criticism involves allowing a role for 'inquiries from outside' a given discipline to have an influence in the evaluation and development of methods. He distinguishes thinkers who hold that only internal criticism is legitimate from those 'specialists whose aims are of such a nature that they can sometimes make good use

of ideas which have grown up in other studies.' This occurs in disciplines such as physical chemistry and physiological psychology: psychology gains from using concepts and methods that were first developed within physiology.

How do these claims relate to his criticisms of Dewey? Although Peirce is not explicit about this, there are sufficient clues in the text to suggest the following. If we are to participate in, and benefit from, external criticism, we need to be able to step back from our current methods and practices and adopt a standpoint from which we can describe and compare different kinds of methods, and in which we possess standards that can be used for making such comparisons. We can investigate how physiological methods from those in current use in psychology, and we have to be able to see how the flaws of the latter can be overcome by exploiting ideas from the former. In that case, Peirce thinks we need a logic that enables us to do this more effectively – or, at the very least, to understand how this can be done. The 'English school of logicians', 'while pursuing studies often purely theoretical, are nevertheless taking a road which may be expected to lead to results of high value for the positive sciences'. (CP8.189)

Dewey's 'Chicago school', like the German school of logicians, are in opposition to the sort of 'exact logic' which Peirce thinks is required for this task. Hence they 'are not making studies which anyone in his senses can expect, directly or indirectly, in any considerable degree, to influence twentieth-century science (ibid). He complains that the German logicians' contributions are irrelevant to the important issues 'because they make *truth*, which is a matter of fact, to be a matter of a way of thinking or even of linguistic expression.' (ibid) At the core of Peirce's criticism is his view that currently fundamental problems for logic involve showing how this kind of objective external criticism is possible and his belief that Dewey's new logic is no better equipped than 'German' logic to

engage with this fundamental problem. As we shall see, Peirce's other criticisms are closely related to this one.

The closing paragraph of the review takes this further. Drawing on remarks in Dewey's first essay, Peirce observes that he 'seems to regard what he calls "logic" as a natural history of thought' (CP8.190). Calling the natural history of thought 'logic' suggest that we cannot expect logic to 'pronounce one proceeding of thought to be sound and valid and another to be otherwise.' (CP8.190) A 'normative science' of logic makes such evaluations, but a natural history of thought does not. The fact that Dewey is prepared to take seriously the possibility that we do not need an account of soundness and validity is, according to Peirce, 'itself fresh confirmation of our opinion of the urgent need of such a normative science at this day'. (ibid)

In the first of Peirce's letters to Dewey, we find further emphasis upon the importance of our knowledge of objective standards of validity and correctness and further insistence that the natural history of thought cannot find room for the normative claims that support the rationality of applying familiar sets of ideas in connection with new subject matters. Intellectual responsibility requires us, not to acquiesce in our prevailing standard of reasoning, but rather to ask whether the methods and rules that we follow are actually ('as a matter of fact') correct. The work of Dewey and his students is 'penetrated with [a] spirit of intellectual licentiousness'. (CP8.241) This strong moral criticism makes sense of the background of the claim that the Normative Science of logic 'the greatest need of our age'. (CP8.239)

> I do not think anything like a natural history can answer the terrible need I see of checking the awful waste of thought, of time, of energy, going on, in consequence of men's not understanding the theory of inference. (ibid)

Peirce tells Dewey that his 'style of reasoning about reasoning has … the usual fault that when men touch on this subject, they seem to

think that no reasoning can be too loose, that indeed there is merit in such slipshod arguments as they themselves would not dream of using in any other branch of science'.[4] (CP 8.239) Getting into his stride, he identifies the effects of holding that a natural history can replace normative science:

> It will 'render the rules of reasoning lax; and in fact I find you and your students greatly given over to what seems to me to be a debauch of loose reasoning.' (CP8.240)[5]

It is easy to see why Peirce suggested that Dewey's book is 'penetrated with this spirit of intellectual licentiousness, that does not see that anything is so very false'. But is there an argument for this? If so, Peirce doesn't give it here. Indeed, having accused Dewey of intellectual licentiousness, he hastens to explain that he would not use such language for anyone of whom he did not feel 'a very deep respect and sympathy'. He tells Dewey that his is 'simply *projecting upon the horizon*, where distance gets magnified indefinitely, the *direction* of your standpoint as viewed from mine.' What this means is very unclear. Does he think that Dewey reasons badly or not? One possibility is that he thinks that Dewey often reasons successfully, but that this is not simply the product of exercising logical self-control successfully. His successes are, perhaps, a matter of luck or a reflection of good training or the possession of good traits.[6]

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[4] It is striking that Peirce's criticisms of Dewey are very similar to familiar dismissals of Rorty's account of epistemic rationality.

[5] Peirce expresses surprise that someone who lives in Chicago (a city with no reputation for being a moral place) could fail to appreciate to fundamental distinctions between Right and Wrong, Truth and Falsity, and to the importance of self-controlled conduct and self-controlled thought. (CP8.240)

[6] Peirce has other criticisms of the strategies employed in Dewey's book. He acknowledges that, even if it cannot usurp normative logic, the natural history of thought may be interesting and important. But at this stage, he begins to criticize Dewey's ideas about how to do natural history. In his review, he observes that studies in the natural history are hard: they 'call for extreme subtlety, precision, and definiteness of thought'. This will require, first, a readiness to learn from established practices of natural history in 'chemistry, botany, and zoology', and second, a readiness to forge a technical vocabulary which will enable us to abandon the 'trivial language of practical life'. So even natural history requires a theoretical backing, a vocabulary for formulating hypotheses when enables us to test them rigorously and without undue vagueness or ambiguity.

Peirce's criticisms of Dewey are similar to some more recent criticisms of naturalistic and historicist approaches to the study of epistemic evaluation. Richard Rorty appears to argue that, rather than having a fundamental concern that our beliefs are true, we should seek opinions that are *justified* and he claimed that the measure of whether our beliefs are justified is fixed by whether our reasons are sufficient to impress admired members of the community to which we belong. I should use the standards of justification that are prevalent in my community. Critics such as Hilary Putnam and Jurgen Habermas have complained that this leads to a highly conservative standpoint, leaving us without criteria for criticizing current practices. In order to do that, we need to stand back and employ 'universal' standards to evaluate our practices: we need external criticism of our epistemic practices and Rorty's account of rational belief limits us to making internal evaluations. (REFS)

When naturalistic epistemologists, such as Quine, claim that the psychology of cognition can meet our epistemic needs, it is objected that this can only provide a descriptive explanatory framework for understanding our practices, but epistemology is concerned with *normative* issues about what we ought to believe. A naturalistic explanation of cognition cannot make sense of how there can be normative standards which, for example, enable us to engage with, and respond to sceptical challenges to our beliefs. It is objected that a naturalistic, psychological explanation of how empirical knowledge is possible simply begs the question through relying upon empirical knowledge of our psychological capacities. (REFS, Quine, Stroud)

That the dispute can be cast in such terms is evident from Dewey's and Peirce's different views about the nature of logical theory. In the opening paragraphs of the *Minute Logic* (1902), Peirce announces that logic is 'the theory of the conditions which determine reasonings to be secure' (CP2.1). Like all theories, the

aim of logic is 'to furnish a rational account of its object'; it 'directly aims at nothing but knowing'. Indeed, its 'highest and greatest value is that it affords us an understanding of the process of reasoning.' Although a theory may prove useful, 'fairness forbids our making utility the criterion of the excellence of a theory.' We should thus judge logic by its contributions to our understanding of reasoning, not by its tendency to help us to reason well. However, although 'it is not in questions closely concerning a man's business that he can with any semblance of fairness look to finding the theory of reasoning helpful (CP2.4), the fact that logic is a 'directive'; or 'normative' science means that, in practice, it may have more applications than other disciplines (CP2.7).

This conception of Logic differs from Dewey's. In the first essay of *Studies*, he describes Logical Theory as 'a generic account of our thinking behaviour' (1903: 3) and as 'generalization of the reflective process' (1903: 5). Although Dewey emphasises that logical theory is concerned with 'the relation of thought as such to reality as such', his interpretation of this shows how far it differs from studying 'right reasoning' and good methods of inquiry. The big difference is: Dewey's logical theory studies our thinking behaviour, what we do and how we do it; and Peirce's logic is seeks to explain when reasoning is 'secure' or correct. How far do the differences between them stem from the fact that Peirce insists that logic is normative science? It is quickly evident that Dewey's definition is supposed leave room for an approach to logical theory that draws heavily upon psychological and other special sciences, while Pierce's definition will rule that out.

How far can Dewey's logic make sense of what Peirce calls 'external criticism'? Or is Peirce mistaken to suppose that external criticism is necessary and possible? We are looking for something analogous to Rorty's defence against the charge that he gives no room to radical 'external' criticism. Rorty suggest that it s enough that we can propose new vocabularies, new ways of talking, giving

them a chance to mature and prosper, perhaps in the hope that they will offer ways of moving beyond ways of thinking that may have become stifling. Rorty's strategy is to give new ways of thinking a chance to establish themselves, and this can occur without any dependence upon universal normative standards. (See Rorty in Brandom (ed) and his 'Pragmatism and Feminism'.)

Larry Hickman's interpretation of Peirce's arguments does not give weight to Peirce's conception of external criticism (Hickman 1986). He reminds us of the respects in which Dewey's conception of the method of science differs from Peirce's and suggests that Peirce's criticisms emerge from he reliance upon a sharp distinction between theory and practice. Whether the need for external criticism depends upon this distinction, I am not sure. The issue when (if ever) external criticism is needed is an issue we must address in the next section. Vincent Colapietro's important response to Hickman also helps us to focus on an issue for further discussion. Colapietro recognizes that, for Peirce, 'what is at stake is nothing less than how … logic is to be defined.' (57), and he sees that a crucial issue concerns whether problems and questions commonly thought of as belonging within logic are 'banished from logic by instrumentalism.' (58) It seems clear that Peirce's view is that the bases or even the tools of coherent 'external criticism' are indeed banished from logic by Dewey's proposals.

One ay to set up the issue is that Dewey wanted to naturalize logic, tying it to biology and psychology, and relying on an account of inquiry which reflects our experience of actual experiences and which is described in terms that use concepts from evolutionary theory (natural history) and psychology. And Peirce's logic aims to be normative and – for fear of circularity – makes no use of information from the special sciences. Colapietro warns that 'this should not be taken to mean that either that Peirce eschewed naturalism or that Dewey eschewed normativity' (59). This leaves open whether Dewey's espousal of normativity allows for external

criticism; and it also leaves open just what is involved in the claim that Peirce could endorse naturalism around 1902 and shortly after. Much depends upon how 'naturalism' is understood. We now turn to some of these issues.

5. Core argument: logic and psychology

When Peirce first wrote to Dewey in June 1904 about the ideas expressed in *Studies in Logical Theory*, he introduced a general line of objection to Dewey's assumption that logic can make use of discoveries drawn from psychology, natural history or the comparative anatomy of thought. He observed that 'the "thought" of which you speak cannot be the "thought" of normative logic' (CP8.239). He had presented a similar objection to the idea that logic can make use of facts drawn from psychology earlier, in his draft of the first chapter of the *Minute Logic* in 1902. Since this earlier presentation of these arguments was more detailed than his remarks in the letter, we shall begin by examining that, before using it to cast light on Peirce's response to Dewey.

Peirce has just rejected the idea that we can use psychological principles to ground the laws of logic, but he next observes that many people 'without citing results of scientific psychology in support of the principles of logic, yet incessantly refer to *data* of psychology … in showing what the laws of logic are.' (CP2.52) He continues:

> All this is beside the purpose. Logic is not the science of how we *do* think; but in such sense as it can be said to deal with thinking at all. It only determines how we *ought* to think; nor how we ought to think in conformity with usage, but how we ought to think in order to think what is *true*. (CP2.52)

He concludes that, in order for premises to be relevant to a conclusion, what is necessary is now something about our thinking but rather about 'the necessary connections of different sorts of fact.'

Peirce supports this view by modifying a claim of Herbart's. Herbart observed that when we talk about thought (Begriff) in logic, we are not concerned with *a thinking* but, rather with 'that which thinking brings before the mind'. It is what some philosophers call a *proposition*, an abstract object or content which can be entertained or *grasped* in thought, but which is objective in the sense that the existence or being of a thought does not depend upon anyone thinking or grasping it. Peirce's modification of Herbart's view of thought arises because explaining a thought as 'what thinking brings before the mind' gives too much of a role to *thinking*: thought can occur, and thoughts can perform their logical roles, without any thinking going on at all.

This is supported by reference to two sorts of examples. Logic is concerned with 'relations of knowledge' and with inferences, and both knowledge and inference are 'of entirely different construction from any thinking process.' First, knowledge does not require the involvement of any thinking – or of the mind – at all. Like Karl Popper, Peirce insists that a book stored in a library constitutes knowledge even if no one ever has, or will, grasp the propositions or thoughts known. (CP2.54, Popper 1972) Second, Peirce argues that computing machines (for example) perform inferences, but they may not think in any psychological sense at all. And even if the drawing of inferences sometimes does involve thinking, this fact is not relevant to the logical question of whether the conclusion follows from the premises. Psychology may help us to understand *how* someone is led to reason badly (for example), but it has no relevance to an inquiry into why the reasoning *is* bad.

Peirce uses such phenomena to show that, for example, the structure of a thought is not dependent upon psychological facts about the psychological process that occur when someone's thinking is concerned with that thought. Peirce supports this by another example. When we look at one of Euclid's theorems, 'the proposition is first enunciated in abstract terms', in verbal terms

that are useful for 'storage'. No inferences can be drawn from the abstract formulation until he 'constructs a figure and reënunciates the proposition with respect to that figure' (CP 2.55). The new reformulation is especially designed so that inferences can be made by 'experimenting upon the diagram or figure. The representation of a proposition that logic requires is one that is fit to bring out the logical, inferential properties of the proposition; and it will not necessarily be well suited for describing the psychological associations that the proposition has. It is a formulation that is designed to reveal when reasoning with a proposition is *correct*. The study of how we think is irrelevant to 'logical criticism'.

When Peirce argues that psychology does not enable us to elucidate the conception of *thought* that is important for logic in his letter to Dewey, the emphasis is slightly different. Normative science studies *possible* thoughts, reflective on whether we should adopt hypotheses which currently have no role in our thinking. So logic needs ways of studying thoughts that, currently, have no psychological role, function, or properties. The natural history of thought, by contrast, depends upon the fact that many possible thoughts do not actually occur (CP2.239), that 'certain conceivable forms do not occur'. Thus it studies 'thought as it presents itself in *apparently* inexplicable and irrational experience'. (CP2.239)

There are a number of points being made in Peirce's discussions of this, and it will be useful to distinguish them.

1. In studying logic, the notion of a *thought* we use is not a purely psychological one. It corresponds to the contemporary notion of a *proposition* and is not to be understood solely in terms of *thinking*.
2. In logical reflection upon the conduct of our inquiries, we need to reflect upon possible thoughts, and possible routes of inquiry, and we cannot restrict ourselves to thoughts which currently have a role in the psychological processes involved in cognition.

3. There are two sorts of relations between thoughts (two kinds of 'association' (Kent ref): psychological relations concerning how the existence of one thought can increase the probability of some other thoughts occurring; normative relations concerning, for example, how the truth of one thought entails the truth of another. Psychology studies the former; and logic studies the latter.
4. Logic provides a body of *theory* which enables us to understand what makes particular kinds of reasoning good. This theory makes use of facts about the relations of thoughts and uses concepts like *truth* and *validity*.

Some of the passages we have considered suggest that Peirce believes that an approach to Logic which draws on the data of psychology cannot endorse *any* of these claims. Moreover, unless we accept all of them, intellectual licentiousness beckons; whatever seems right to us, will be right. The most important issue concerns the need for a theory of 'right reasoning'. Peirce appears to hold that without (4), we can't have (1) – (3). Dewey rejects the kind of logical theory proposed in (4): his 'logical theory' consists in the natural history of thought.

In order to understand Peirce's criticisms, we need to look for areas in which responsible inquiry requires us to attend to the properties of *thought*, where that concept is understood in a logical, rather than a psychological fashion. Peirce does not provide a detailed explanation of this. In an attempt to read his mind, we shall consider several phenomena which are important for Peirce's conception of reasoning and inquiry, but which, he may reasonably have supposed, could only be understood in terms of the logical conception of thought.

First it is possible for us to misuse thoughts and arguments, to give them a role in our inquiries for which they are not fitted. One example would be the gambler's fallacy: the roulette player, having seen a run of cases where the ball lands on red, places a large bet

on black for the next spin. Although the gambler may have a habit of using probabilistic judgments to guide conduct in this way, a better understanding of propositions about probability enables us to see that this is not the rational procedure that we take it to be. How the gambler does behave on the basis of probabilities, and how he *ought* to behave, are not the same. If we are to criticize this irrational behaviour, we need to be clear about the logical and semantic properties of thoughts about probabilities. If, however, we explain what probabilities are by paying attention to what we deluded gamblers actually do with them, we will lack the objective basis for comparison that enables us to see that such behaviour is mistaken and to explain why it is not the source of true beliefs that we take it to be. How people use thoughts about probabilities in their inquiries may be unreliable as an explanation of what thoughts about probabilities are.

Another example may be provided by one of Peirce's examples of the application of the pragmatist maxim. The proposition that the communion wine is the blood of Christ has a functional role in the thoughts and inquiries of many Catholics who, according to Peirce, take this proposition as literally true. A logical analysis of proposition about whether something is wine or whether it is blood is provided by the application of the pragmatist maxim. This reveals that, when we identify something as blood, we ascribe to it a number of sensible properties that are incompatible with it being wine.(REF) In general, if we are to avoid error, we need to understand the logical properties of propositions, not the functional roles that these propositions have in our inquiries and practices. Some of Peirce's criticisms of Dewey's logic trade on such examples: if we analyze thoughts in terms of their roles in inquiry, we cannot cast doubt upon their suitability for filling those roles.

Second, in his review of Dewey's *Studies in Logical Theory*, Peirce's examples of 'external criticism' of theories and concepts included cases where ideas from one discipline are applied in

another: he writes of physiological psychology and physical chemistry, for example. It is difficult to see exactly what he has in mind, but I can suggest two possibilities. First, if we have a wholly psychological conception of *thought*, it seems that whenever a concept or hypothesis acquires new roles in our practices, then its identity will change: for example, propositions whose natural home lies in physiology begin to be used in the formulation of psychological explanations. Once we have a clear grasp of the logical or semeiotic properties of these concepts and propositions, we have the materials to explain why it is good to develop psychology in this direction.

A third possibility is, once again, close to Peirce's pragmatism. The growth of science is accompanied by the forging of new concepts. When we wonder which concepts to use, we need to think *about* propositions and concepts which currently have no role in our thinking and inquiries. We cannot think about them in terms of their current role in inquiry, because they have no such role. However, so long as we can provide logical analyses of them, perhaps ones that reflect the application of the pragmatist maxim, we possess information that can guide us in grasping how these concepts may prove valuable in our explanations and how reasonable it would be to incorporate them in our abductive suggestions. Once again we need to appeal to information which is independent of our current use of the concepts in order to evaluate their suitability for future use.

The examples we have sketched all show how we need resources for making evaluations of our current practices and of conceptual innovations we may adopt in the future. This requires that there must be a way of characterizing concepts and propositions which does not depend upon descriptions of their current use. Peirce's logical theory aims to provide this sort of information, and Peirce thinks that Dewey's 'natural history of thought' cannot do this. Moreover the possibilities of such analyses

must extend to *possible* propositions, ones for which we currently have no use. Peirce's own logic *appears* to go further than that: it suggest that his theory should formulate laws and principles that govern *all possible thoughts*, not just those that we do make use of or which we are likely to make use of. Is there any reason why Peirce should want this?

The answer to this question that I shall sketch is extremely speculative, supported by little explicit evidence from Peirce's writings. At best it is suggestive and makes sense of some developments in Peirce's thought after 1902. One component of Peirce's logical theory is the pragmatist maxim, a logical rule for the clarification of concepts. Application of the rule is valuable for leading us to information about how to test propositions and hypotheses. But is also valuable through enabling us to dismiss some apparent propositions and hypotheses as empty: if an hypothesis cannot be clarified in ways that identity the practical consequences we would expect if it were true, the we have reason not to take the hypothesis seriously. Indeed, a pragmatist is committed to the expectation that future science will have room for no concepts that cannot receive a pragmatic clarification, and no methods of reasoning whose use calls upon features of concept which a pragmatist clarification will not bring to the surface. The natural history of thought can demonstrate is that the concepts we use now are all capable of a pragmatist clarification. And perhaps we can be justified in expecting that this will continue given fairly small changes in our current practices. The empirical evidence cannot support the conclusion that, however radical future changes in methods and concepts may be, there is no *guarantee* that we shall not come to use new kinds of arguments and new kinds of concepts which provide counterexamples to the pragmatist maxim. We may be pretty sure that this won't happen, but confident use of the maxim as a tool for dismissing suggested new concepts will not be possible unless we have an explanation of how it is not possible

for there to be respectable concepts that do not accord with the maxim. Unless the logical theory covers *all possible* thoughts and signs, we can at best *hope* that the pragmatist maxim will not lead us astray. This provides one reason for Peirce to take his search for a 'proof' of pragmatism seriously: we need a systematic theory of concepts, signs and reasoning which explains why *all* concepts *must* be compatible with pragmatism.

6. Some evaluations

We began by examining Peirce's complaints about Dewey's 1903 conception of logic and concluded that it was not ruled out that Dewey could account for the possibility of some measure of self criticism (section 4). We then identified the most important of Peirce's reasons for thinking that logic should not draw upon facts or data from psychology. When evaluating beliefs and inquiries, we employ thoughts and propositions, arguments, and laws as resources, and Peirce argued that, if we explain what thoughts etc are in psychological terms, we are prevented from making important critical evaluations of our activities. Normative logic treats propositions as objective mind-independent things which can be assessed using concepts like *truth*, *reference, logical consistency*, *validity, and so on.* We noticed that various kinds of epistemic evaluation and criticism appear to make sense only against the background of a non-psychological conception of a thought (section 5). Does Dewey have a response to this?

Both Peirce and Dewey agree that inquiry is an activity, an attempt to solve problems through relying upon experience and experiment. There are differences in their views of the aims of inquiry: for Peirce, the object is to arrive at settled belief (settled belief in some proposition) which, for Dewey the object is more holistic, the replacement of an indeterminate situation by a determinate one. However, they agree that both common sense inquiry and specialized scientific inquiry adopt similar methods, the

main differences being that where everyday or common-sense reasoning depends primarily upon habits and instinctive responses, to different degrees, the special sciences have to be more reflective and careful in reaching decisions, using mathematical techniques, special techniques of observation and so on. The sort of difference that emerges from Peirce's discussion of Dewey concerns how we should think about the sorts of resources that are available to us in carrying out, reflecting upon, and evaluating inquiries. These resources can involve information, arguments, assumptions or suppositions, and so on.

We can begin with Peirce's views about the sorts of things we employ when carrying our inquiries. One can of thing we attend to and manipulate are *thoughts* or *propositions*. Sometimes propositions can be believed or doubted, but they can also be entertained, reflected upon and so on. When our dealings with propositions are conscious, then, Peirce holds, we attend to diagrams, representations of states of affairs, and we experiment upon these diagrams in accordance with rules in order to increase the amount of information we possess. We also employ *arguments* – and once again, if we do so consciously we can observe representations of arguments and experiment upon them. Argument forms guide us in manipulating representations of elements of our surroundings in order to put ourselves into a position better to solve the problems (settle the doubts) that we face.   I have spoken of these processes occurring habitually or through conscious reflection. They can also occur more publicly, as when we employ representations of propositions of arguments on paper or inquire collectively through conversation. But one thing we need to keep clearly in mind is that Peirce's logic and semeiotic provides, inter alia, a *theory* of propositions and arguments, of the kinds of things we attend to and experiment upon when we inquire reflectively. And the theory provides the information that enables us to determine

whether our uses of propositions and arguments are logically legitimate: it is a theory that facilitates 'right reasoning'.

Dewey said little about these matters in 1903. But their importance is clear in *Logic: The Theory of Inquiry*, where he observes that 'declarative propositions, whether of facts or of conceptions (principles and laws), are intermediary means or instruments (respectively material and procedural) if affecting the controlled transformation of subject matter which is the end-in-view (an final goal) of all declarative affirmation and negations.' (LW12: 162). We can understand the importance of 'propositions' only if we acknowledge their 'intermediary role' in the reflective deliberations we employ in order to achieve our cognitive goals. And Dewey is surely right to draw a distinction between the things we assert or accept at the end of our inquiry from the propositions and arguments we attend to or reflect upon in the course of the inquiry, the distinction between what he calls *judgement* and *proposition*. [7]

Once this is recognized, we can distinguish questions of two different kinds that can be asked about particular propositions or arguments. We can ask strategic or tactical questions that concern when or how we should attend to particular proposition or reflect upon the relevance of what we are doing of a particular argument or principle. Answering such questions requires a good deal of experience, sensitivity and judgment. I doubt that there are any rules which determine when and how we should attend to particular propositions. But when we make judgments about how to conduct our inquiry, we will make use of information about our 'end-in-view', about the context in which our inquiry occurs, and about the properties of the various symbols to which we may attend.

In order to clarify the issue we should consider Gilbert Harman's distinction between *logic* and *reasoning* (Harman 1986).

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[7] See Thompson 1903 for a discussion of this distinction. According to Thompson, although the distinction may originate in Hegel's use of these two terms, Dewey's distinction is not the same as Hegel's.

Suppose that, in the course of an inquiry, we attend to information symbolized in such conditional propositions as:

- The book I am holding is red.

- If the book I am holding is red, then the book I am holding is my copy of Dewey's *Studies in Logical Theory*.

If I attend to these two propositions, I can see that there is a valid argument with them as premises and the conclusion:

- The book I am holding is my copy of Dewey's *Studies in Logical Theory*.

Peirce would insist that this argument is valid: it is not possible that both premises be true and the conclusion false. If I accept both premises and believe that the book is not my copy of *Studies*, then I have inconsistent opinions.

This information may guide my reflections, but it does not determine the course my reasoning should take. I might conclude that the book I hold is my copy of *Studies*; but if I have a clear memory of leaving that book at home, I may begin to question my acceptance of the conditional premise or even wonder whether perhaps my colour perception was flawed. This may lead me to reopen one of these questions, or I may just let the issue drop, deciding that it is of no significance. Even granted logical the facts described in the previous paragraph, the route taken by my reflections will also depend upon a host of background factors. In spite of that, it is clear that I cannot accept an inconsistent set of propositions[8]. If I do, something is wrong, and Logical theory can explain why this is so, even if it cannot explain how I should remedy the situation.

In his *Logic*, Dewey considers conditional propositions, his examples including

1. If the Phaedo is historical, Socrates believed in the immortality of the soul

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[8] We ought to acknowledge that there are dialethic logicians, such as Graham Priest, who would deny this, some of them claiming that there are true contradictions (ref)

2. If this drought continues, the harvest will be very poor.
3. If the rain continues, the scheduled ball game will be postponed.
4. If that is dropped, an explosion will probably follow.

In such cases, 'there is postulated an existential connection between the existential conditions in which the terms "antecedent" and "consequent" have literal or existential meaning. But his fuller explanation indicates that such propositions always 'determine a problem', and this is because they offer advice or warning. ((1938: 298-9) However, we should note that while conditionals are sometimes used with such purposes, this is not always the case. Consider:

5. If the sunshine continues, we can go to the beach.

Such conditional can be put to different kinds of purposes, and we would hope that logic would provide an account of conditionals which provides an *explanation* of why some uses of conditionals are legitimate while others are not. And for Peirce, this is done through a systematic account of the inferential roles serves by propositions with this kind of form.

Thus brings us to a real different between the views of Peirce and Dewey. As we shall see below, Peirce distinguishes three different logical disciplines: speculative grammar, critic, and speculative rhetoric or methodeutic. Critic analyzes and systematizes different kinds of arguments, enabling us to distinguish valid arguments from invalid ones.[9] And speculative grammar/ methodeutic, among other things, has room for the study of strategic and tactical issues about how we can use arguments and propositions in order to solve our problems effectively. The study of validity and arguments is prior to the study of the norms of problem solving, which means that normative logic provides us with resources for formulating and defending views about the norms of problem solving and reasoning. We can appeal to logic to defend

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[9] Footnote on inductive and probabilistic arguments.

uses of conditionals and also to explain the success of inquiries and activities based upon the use of conditionals. Peirce emphasises the importance of this sort of two tier approach, and Dewey appears to have no time for it. And Peirce's views seems to be that the kinds of evaluation and criticism discussed in section 5 *requires* the two tier picture: we need to be able to explain why some uses are simply *wrong*; and we need to be able to appeal to logic to compare and evaluate different ways of using such expressions. Our practice is constrained, and logic describes the constraints.

7. Peirce on the possibility of a normative logic

As we saw in section 3, Dewey's original rejection of pure logic was defended by appeal to the failure of Lotze's attempt to produce one. Indeed, if pure, or normative, logic is impossible, then Peirce's criticisms of Dewey fail. It is likely that Dewey never studied the details of Peirce's work in logic and his views about how it was possible to construct a logic relying only on principles drawn from disciplines which do not depend upon logic.

So, why did Peirce think that 'normative logic was defensible? We need to examine four other issues. Peirce's review and his letters to Dewey do not deal with these issues in great detail although they contain suggestive passages. However these issues are to the fore in his other writings from around 1903 and 1904 and these provide guidance to what he had in mind.

- Exactly what is the content of Peirce's normative logic?
- In the light of Dewey's criticisms of Lötze, how, according to Peirce, is a respectable form of what Lötze would call 'pure logic' possible at all?
- What is the epistemic status of this normative logic: is it a priori or a posteriori?
- Does Peirce's normative logic rest upon substantive metaphysical assumptions?

First, then, what is the content of Peirce's normative logic of possible thoughts? In his writings from the early 1900s, Peirce divides logic into three branches: speculative grammar, critic, and methodeutic. Speculative grammar – the names comes from Duns Scotus and Peirce sometimes calls it 'formal grammar' (REF) – is 'the general theory of the nature and meanings of signs' (EP2: 260). It studies '*modes of signifying* in general' (EP2: 19) and provides 'an analysis of what sorts of signs are absolutely essential to the embodiment of thought' (EP2: 257). The second branch of logic – 'critic'- 'classifies arguments and determines the validity and degree of force of each kinds' (EP2: 260). And the third branch – methodeutic – 'studies the methods that ought to be pursued in the investigation, in the investigation and in the application of truth'. (EP2: 260) The content of methodeutic may be varied, but it surely includes principles such as Peirce's pragmatist maxim as well as a variety of standards of plausibility etc which function in a regulative way. It thus seems that speculative grammar will offer an exhaustive account of kinds of 'embodiment' that thoughts can receive, and critic will provide a similarly exhaustive classification of possible arguments. In ambition, Peirce's logic is not dissimilar to Lötze's.

Our second question is: How, for Peirce, is this sort of pure logic possible? There are two clues in his responses to Dewey's book. First, Peirce draws a distinction between disciplines that 'depend upon logic' and those which do not depend upon logic. The disciplines that do *not* depend upon logic include mathematics, phenomenology and ethics, and Logic should only make use of principles drawn from them. When logicians make use of principles from disciplines that do depend upon logic – his examples are 'Metaphysical Philosophy, Psychology, Linguistics … History etc' (CP8.242) – they use arguments which are circular and thus fallacious (CP8.242). These remarks need one qualification: critic can legitimately draw on principles from speculative grammar; and

methodeutic can also employ results from critic. So our question becomes: How can a respectable version of pure logic be grounded in mathematics, phenomenology and ethics? I shall not be concerned here with the *details* of Peirce's account of how logic is possible. For this paper I am concerned with the identifying the kind of grounding he seeks.

We can deal with the role of mathematics quickly. Peirce uses 'Mathematics' in a way that, to some readers, may be controversial or eccentric: mathematics is the practice of necessary reasoning. We use mathematics whenever we draw a conclusion which follows necessarily from our premises. Mathematical reasoning relies upon a logia utens, a collection of inferential habits that we can treat as uncontroversial and as having no need for theoretical defence. Moreover, mathematics provides the analytical tools which we use when carrying out phenomenological investigations. Although Peirce takes the word 'phenomenology' from Hegel, he distinguishes his project from Hegel's. He takes himself to agree with Hegel in thinking both that the role of phenomenology is to vindicate a system of categories also that this science should 'just contemplate phenomena as they are, simply open its eyes and describes what it seems. But he says that Hegel understood phenomenology in a 'fatally narrow spirit, since he restricted himself to what *actually* forces itself on the mind' while 'I will not restrict it to the observation and analysis of *experience* but extend it to describing all the features that are common to what is *experienced* or might conceivably be experienced or become an object of study in any way direct or indirect.' (EP2: 143)[10] Peirce uses this system of phenomenological exploration to identify his system of categories. All the elements of what appears, or can appear, or can be thought of or can be conceived of can be classified according to whether they present monadic, dyadic or triadic aspects. These techniques can also be used to identify what sorts of things we can admire

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[10] This suggests that, as a matter of fact, his phenomenology may be closer to Husserl than to Hegel.

unconditionally, and what sorts of ends for conduct we can adopt or admire unconditionally. Since Peirce observes that his phenomenological approach to the categories 'inevitably leads to a distinction between form and matter' (EP2: 362), his investigations are supposed to lead us to an account of the formal features of all possible thought and experience and also provide an account of fundamental norms for conduct and inquiry. Once we have this systematic and exhaustive account of the *formal* aspects of thought and experience, we can use these categories to provide an account of all *possible* thoughts and arguments. This depends upon our possession of this system of formal, universal, phenomenological categories. Firstness, Secondness, and Thirdness.

We can now consider some features of the epistemology of these normative sciences. Is our knowledge of logic a priori or a posteriori? (REF)And if it is a priori, does that mean that Peirce's position has all the disadvantages of Lötze's? This question does not have a direct answer. Logic does not depend upon any special empirical observations or techniques. There is no danger that our view may be mistaken because we have had the bad luck to rely upon an unrepresentative body of evidence, as will often happen in ordinary inductive reasoning. Although phenomenology is observational – and thus not a priori – its 'observations' concern anything that can be experienced, conceived, imagined, thought about and so on. We can take responsibility for constructing these different possibilities and we do not have wait for nature to force them upon us. So, logic is a priori in so far as its success does not depend upon our having the good luck to have all the appropriate experiences. But it is a posteriori in so far as phenomenological investigations rest on what is experienced and what might be experienced.

Some commentators upon these debates object that Peirce's approach to logic depends upon substantive metaphysical assumptions. Contrary to Peirce's stated aims, he makes logic draw

its principles from 'Metaphysical Philosophy'. (REFS) This is because research in logic depends upon the system of categories, Firstness, Secondness, and Thirdness. A system of categories of this kind seems to embody a metaphysical vision. Peirce would resist this criticism, and with reason. His response would depend upon a distinction between metaphysical categories and phenomenological categories. The phenomenological categories classify the elements of possible experience and thought; but the metaphysical categories classify the different sorts of modes of being that are to be found in reality. Peirce should agree that his work in logic would be flawed if it depended upon a system of *metaphysical* categories. But all he needs for his work on logic is the system of *phenomenological* categories. There may be an argument from the phenomenological validity of his categories to the conclusion that the categories are manifested in the modes of being we encounter in reality. But such an argument would not be available to him until he had defended some important logical principles.

There is evidence that this is the correct diagnosis of Peirce's objections to Dewey's logic. First, as we have noted above, the issues I have just described were absolutely central to Peirce's other writings at the time of his comments on Dewey's logic. The role of phenomenology is also evident in the continuation of a passage we have already commented on.

> For it is one of the characteristics of all normative science that it does not concern itself in the least with what actually takes place in the universe, *barring always its assumption that what is before the mind always has those characteristics that are found there and which Phänomenologie is assumed to have made out. But as to particular and variable facts,, no normative science has any concern with them, further than to remark that they form a constant constituent f the phenomenon*. (italics added, CP8.239)

But this passage introduces another twist in the argument. The reliability of phenomenology is twice alluded to as an 'assumption' and as something that is 'assumed'. An assumption would, surely, be very weak foundations for an exact and rigorous formal logic. And it seems clear that phenomenology could let us down if we lacked the skills and powers of imagination that are required for research in phenomenology (REFs). The reliability of phenomenological researches is not self-evident. [11]

This remark supports a view about Peirce's phenomenology which was suggested in Hookway 1985. Recall that Peirce's Ethics employs phenomenological techniques in order to identify what can serve as an ultimate end. In 1903, in his Lectures on Pragmatism, he acknowledged that there was no *a guarantee* that an ultimate end was available. Whether there is such an end, he says, is a 'metaphysical question that does not fall within the scope of normative science to answer' (EP2: 203). He continues:

> [Just] as in playing a hand of whist, when only three cards remain to be played, the rule is to assume that the cards are so distributed that the odd trick can be made, so the only rule of ethics will be to adhere to the only possible ultimate aim, and to hope that it will prove attainable. (EP2: 203).

This is a strategy that Peirce often defends in his later writings. If we can achieve our goals in logic only if we can carry out inquiries in phenomenology successfully, then it is rationally to adopt the *hope* or *assumption* that we can do so, even if we would not be rational to hold a certain belief that we can. In that case, logic does not rest upon confident but ungrounded beliefs with a substantive subject matter. Rather it is rational to proceed on the basis of a hope or

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[11] There is another Peircean doctrine which is relevant here, but whose relations to the other ones I don't yet clearly understand. Peirce often described philosophy as 'coenoscopic': it relied upon observations, but not upon the special observations we make use of in the special sciences. Instead, philosophical observations are of things which are manifest and obvious to anyone who cares to make them: 'These observations escape the untrained eye precisely because theyb permeate their whole lives'. They fall 'within the range of every man's normal experience and for the most part in every waking hour of his life'. (CP1.241)

regulative idea. This seems to be the best explanation of Peirce's references to *assumptions* in this passage. By hoping, rather than believing, that we possess these skills, we avoid circularity.

8. Conclusion

I have argued that the issue between Peirce and Dewey concerns the kind of theoretical framework we should use to inform our judgments about which how to conduct our reflections on how best to carry out our inquiries. Peirce holds that, in at least some cases, we need to take account analyses of thoughts, arguments, and methods of inquiry which are cast in normative, logical terms rather than in psychological terms. Who is right may depend, ultimately, up whether Peirce can actually deliver the sort of 'normative logic' that he advocates, without relying upon any information drawn from sciences which 'depend upon' logic. Some scholars trace the disagreement to substantial metaphysical differences, or disagreements about important philosophical issues. In this closing section, I shall consider two such suggestions.

In his paper, 'Why Peirce didn't like Dewey's logic' (1986), Larry Hickman traces the disagreement to a deeper difference about whether there we should recognize a dualism of theory and practice (1986: 186). He quotes Dewey saying that 'the conduct of scientific inquiry, whether physical or mathematical, is a mode of *practice*; the working scientist is a practioner above all else, and is constantly engaged in making practical judgments: decisions about what to do and what means to employ in doing it.' (1938: 161). I see nothing in that quotation with which Peirce would take issue. Indeed, my description of Peirce's views about reflection in the service of inquiry in section 6 supports this. All inquiry involves activities; all inquiry involves appeals to experience and to experimentation. This even applies to disciplines such as phenomenology and the normative sciences; they differ from the special sciences primarily in the supposed fact that, in those disciplines, we do not risk going

wrong because of our dependence upon the environment to provide us with opportunities to make the most important and representative observations.

Hickman defends his interpretation by pointing to some of Peirce's writings around 1898 in which he did appear to distinguish how we deal with 'vitally important issues' from how we deal with theoretical science.(Peirce 1992: REF, and see Hookway 2000: chapter one, which may seem to support something of what Hickman is saying.) This passage too is in harmony with the quotation from Dewey; the method of science is involved in both sorts of cases; and the decisions we have to make concern what means we should adopt to pursue our inquiries.

There is a continuity of cases here, and Peirce is mostly concerned with the two extreme cases, and discusses them in a somewhat exaggerated manner. Two concepts are particularly relevant to his argument. Like all pragmatists, Peirce was sympathetic to the common sense philosophy, holding that, a lot of the time, we do well to trust our habitual or instinctive responses to things. Such responses are sensitive to experience and reflect years, if not generations, or experience. If we trust our habitual responses in some area, then, when we carry out inquiries, we do best to avoid too much reflective self-questioning: we wisely judge that there are limits to sensitive reflection. Indeed, the more we try to reflect, the greater the risk that we will lost our grip upon knowledge that we possess. Thus, Peirce supposes, when we think about vital issues, such as the existence of God, we do better to tap into our common-sense certainties on the matter than to demand a proof before we believe. Most of the passage that Hickman mentions is, I conjecture, urging us not to demand theoretical justifications, or trust controversial theories, when responses grounded in secure common-sense are available to us.

The other extreme emerges when we are working at the cutting edge of current research, perhaps in Physics. Here our

common sense responses to questions about which theory to accept are much less trustworthy; reflection, experiment, the development of new techniques, the search for new experiences are indispensable. And in this case, we are especially conscious of our fallibility. Indeed, we would be amazed if the latest ideas (including our own) did not turn out to be temporary stopping points en route to a better account of things. Moreover, the method of science doesn't tell us when to stop gathering relevant experience and *believe* our current theory. At best we view current results as what it is reasonable to accept, provisionally, at the current stage of inquiry; and Peirce is ready to call that 'scientific belief'. In that case, the norms which govern the conduct of the practice of physical research should make us reluctant to view these cutting edge results as a wholly reliable basis for practical applications in medicine or some other are of human life. We should not be too ready to seize on opportunities for finding the theory 'useful'. And this is why Peirce is ready to describe science as 'useless': cutting edge science is too fallible for us to make great claims for its usefulness. With time, things may settle down, and then we can think of how the theory may be useful; but until that happens, those working in the discipline do best to try to refute it so that we can make the next step forward in theoretical understanding.

Many cases will lie between the two extremes, and once we are confident that a body of scientific theory has settled down, a concern with theoretical understanding may be able to co-exist with an interest in practical applications.

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