

Hegel and Peircean Abduction

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'Abduction' was the term Charles Sanders Peirce used in his later writings for a type of inference that he had earlier called 'hypothesis' and that is now commonly called 'inference to the best explanation'. According to Peirce, abduction constituted, alongside induction, a distinct *second* form of non-demonstrative or probabilistic inference. Especially in his later work, Peirce conceived of abduction methodologically as a distinct step in scientific inquiry. By abduction the investigator postulated some possible non-apparent cause which would explain the existence of otherwise surprising phenomena. This postulation was then to be empirically tested by procedures drawing on deduction and induction. Peirce related his treatment of abduction to Aristotle's syllogistic, mapping his three inference forms to Aristotle's three syllogistic figures, but I suggest a more proximate genealogy. Both Peirce's account of the interdependence of these three inference forms, and his mapping of them onto the syllogistic figures closely parallels Hegel's treatment of non-demonstrative inference in the *Science of Logic*. Furthermore, both Peirce and Hegel regard their postulated third inference forms as somehow implicit within the structure of a particular type of perceptual judgment: aesthetic judgment. After laying out these similarities in the respective approaches of Peirce and Hegel to inference forms I suggest a common origin in their similar attempts to draw inferentialist conclusions from Kant's transcendental logic.

1. Peirce's Treatment of Abduction

In 1903 in his 'Lowell Lectures' at Harvard, Peirce recounted how he had come to the idea of abduction. It had arisen, he notes, as a consequence of his effort to find a way of representing inductive inference syllogistically: 'I endeavored to formulate the process [of induction] syllogistically; and I found that it would be defined as the *inference* of the major premiss of a syllogism from its minor premiss and conclusion. . . . With this hint as to the nature of induction, I at once remarked that if this be so there ought to be a form of inference which infers the minor premiss from the major and the conclusion' (quoted in Murphey 1961: 60).

Peirce had worked out these ideas in the late 1860s and had given a synoptic presentation of his position in a paper of 1878, 'Deduction, Induction and Hypothesis' (Peirce 1992a: 186–99). The example he uses draws on probabilistic ideas concerning the sampling of populations. Consider a situation in which

I draw a handful of beans from a bag and, on finding them all to be white, infer that in fact all the beans in the bag are white. I can set out the inference so:

These beans were in this bag.

These beans are white.

∴ All the beans in the bag were white. (Peirce 1992a: 188)

But we can see that this inductive inference is in fact an inversion of a deductive one:

Rule.—All these beans in the bag were white.

Case.—These beans were in the bag.

Result.—These beans are white.

'So that induction is the inference of the *rule* from the *case* and *result*' (Peirce 1992a: 188).

Peirce now points out that there is a further way of arranging the parts of the deductive inference to get a non-deductive one, the resulting inference being neither from population to sample nor from sample to population:

Suppose I enter a room and there find a number of bags, containing different kinds of beans. On the table there is a handful of white beans; and, after some searching, I find one of the bags contains white beans only. I at once infer as a probability, or as a fair guess, that this handful was taken out of that bag. This sort of inference is called *making an hypothesis*. It is the inference of a *case* from a *rule* and *result*. We have, then—

Deduction

Rule.—All the beans from this bag are white.

Case.—These beans are from this bag.

∴ *Result.*—These beans are white.

Induction

Case.—These beans are from this bag.

Result.—These beans are white.

∴ *Rule.*—All the beans from this bag are white.

Hypothesis

Rule.—All the beans from this bag are white.

Result.—These beans are white.

∴ *Case.*—These beans are from this bag. (Peirce 1992a: 188)

Inferences, then, can be divided into two basic types, deductive or analytic, on the one hand, and synthetic on the other, and synthetic inference can be further divided into two types, induction and hypothesis (abduction). While in induction we 'conclude that facts, similar to observed facts, are true in cases not examined', in abduction we 'conclude the existence of a fact quite different from anything observed, from which, according to known laws, something observed would

necessarily result'. Induction is thus 'reasoning from particulars to the general law' while abduction is from 'effect to cause', the cause which 'explains' the observed situation that it has brought about (Peirce 1992a: 194).

Despite later dramatic changes in his underlying formal logic, occasioned by his discovery of the logic of relations and quantification theory in the early 1880s, Peirce maintained this threefold classification of inference, working it into an account of scientific method in which each form of inference performed a particular role.¹ Peirce believed himself to be the discoverer of abductive inference, but in fact essentially the same idea was anticipated by both Kant and Hegel.

2. Inference Forms in Kant and Hegel

Besides induction, both Kant and Hegel postulate a second form of non-demonstrative inference, 'inference according to analogy'. Thus in the *Jäsche Logik*, Kant says that while inference through *induction* infers 'from *many* to *all* things of a kind', inference according to *analogy* infers from '*many* determinations and properties, in which things of one kind agree, to the remaining ones, insofar as they belong to the same principle' (Kant 1992: 626).² Both these forms of inference are ampliative in that they involve an extension of cognition. In induction, 'finding the universal' is merely a matter of making a *quantitative* inference from 'many' to 'all'. It proceeds, Kant says, according to the 'principle of universalization'. In contrast, inference through analogy proceeds according to the principle of *specification*.

In various works Peirce criticised the idea that abduction could be thought of as a type of 'reasoning through analogy', but significantly, in 'Deduction, Induction and Hypothesis', he characterises 'hypothesis' (or 'induction by characters' as he says it had been known), in essentially the same way as that used by Kant for inference by analogy. Thus Peirce says that in hypothesis 'a number of characters belonging to a certain class are found in a certain object; whence it is inferred that all the characters of that class belong to the object in question' (Peirce 1992a: 192) while Kant says that analogy 'extends the *given properties* of one thing to several [other properties] of the *very same thing*' (Kant 1992: 626).

In the *Jäsche Logic* Kant's example (also used by Hegel) involves inferring from certain known characteristics of the moon to the postulate of its having 'rational inhabitants' on the basis of the analogy of the moon with the earth. Clearly such inferences, as Kant notes, do not result in *necessity* in the way that is characteristic of the formal 'inferences of reason'. Nevertheless they are 'useful and indispensable for the sake of extending our cognition by experience' (Kant 1992: 627). In fact Kant gives a more helpful example in the *Critique of Pure Reason* in a passage to which Peirce is said to have appealed in the talk to the Metaphysical Club in which he actually coined the term 'pragmatism' (Menand 2001: 227).

The example there is one that is commonly used in discussions of inference to the best explanation and concerns the diagnosis of disease.

In discussing 'believing' [*glauben*] as a cognitive state that stands between 'opining' [*meinen*], which has merely private or subjective validity, and 'knowing' [*wissen*] which has objective validity, Kant describes the 'pragmatic belief' of the physician who 'must do something for a sick person who is in danger,' but who 'does not know the illness' that he:

looks to the symptoms, and judges, because he does not know of anything better, that it is consumption. His belief is merely contingent even in his own judgment; someone else might perhaps do better. I call such contingent beliefs, which however ground the actual use of the means to certain actions, *pragmatic beliefs*. (Kant 1998: A824/B 852)

Hegel appears to follow Kant in his treatment of the inference forms. In his treatment of forms of material inference as *sylogisms of reflection* in the third book of the *Science of Logic* besides the deductive 'inference of allness', Hegel discusses the two non-demonstrative inferences of induction and inference by analogy (Hegel 1969: 686–95). But in Hegel's account there is a further striking parallel with the approach of Peirce as Hegel, like Peirce, maps these three inference forms onto Aristotle's three syllogistic figures. I will first examine Peirce's account, then Hegel's.

3. Inference Forms and the Three Syllogistic Figures

In 'Deduction, Induction and Hypothesis', having established the distinctness of the three inference forms from the perspective of probabilistic reasoning, Peirce goes on to discuss a *second* way of inverting a deductive syllogism to produce the non-demonstrative inferences of induction and hypothesis. From the pattern of a valid deductive inference, the first syllogistic figure of Barbara, one can, using Modus Tollens, derive from the denial of the conclusion, the denial of either of the major or minor premises. Peirce gives the following example:

Barbara:
 Rule.— All men are mortal.
 Case.— Enoch and Elijah were men.
 ∴ Result.— Enoch and Elijah were mortal.

From this, two further valid deductive inferences can be formed by denying the result. First, if the result is denied while the rule is affirmed we must infer the denial of the case:

Denial of the Result.— Enoch and Elijah were not mortal.
 Rule.— All men are mortal.
 ∴ Denial of Case.— Enoch and Elijah were not men.

On the other hand, if, having denied the result, we affirm the case, we must infer the denial of the rule:

Denial of the Result.— Enoch and Elijah were not mortal.

Case.— Enoch and Elijah were men.

∴ Denial of the Rule.— Some men are not mortal. (Peirce 1992a: 190)

As Peirce points out, with this we have generated the syllogisms Baroco and Bocardo which are moods in the second and third Aristotelian figures respectively.

Hegel's way of describing the syllogistic figures to which he relates the three inference forms elaborates on Aristotle's own notation, so to follow Hegel here we first need to look briefly at Aristotle's way of generating the imperfect syllogistic figures. In the *Prior Analytics* Aristotle schematises the mood Barbara in the first figure as a sequence of three terms, the major, middle, and minor terms, which he designates as A, B and C respectively. Aristotle's approach has been said to derive from Plato's treatment of conceptual division,³ and correlative with this, the sequence from A to C characterises a series of concepts in an order from the most general to the most specific, related in such a way that each subsequent term is the subordinate to the term anterior to it. Hence, we are to read the syllogism ABC as: 'if A is predicated of all B, and B of all C, A must necessarily be predicated of all C' (Aristotle 1996: APr 25b39–40). Barbara can thus be expanded as:

AaB Mortal can be said of all men.

BaC Man can be said of all Athenians.

∴ AaC ∴ Mortal can be said of all Athenians.

where 'a' represents the syllogistic relation of universal affirmation.

Syllogisms in the first figure such as Barbara are 'perfect' in the sense that not only are they valid but that their validity is totally perspicuous.⁴ Aristotle's language here suggests the visualisability of this relation, an idea possibly linked to the use of diagrams to represent these inference forms, as well as to the fact that the relations involved can be expressed in terms of conceptual containment. That is, one can equally express the idea of a term being predicated of all of another with that of the latter being 'wholly contained in' the former. Barbara can thus equally be described by saying of the three terms that 'the last is wholly contained in the middle and the middle is wholly contained . . . in the first' (1996: APr 25b32–35), a formulation allowing one to 'see' by the transitivity of the relations involved that the last term is wholly contained in the first. Syllogisms in the second and third figures, by contrast, are imperfect – although valid they are not perspicuously so, thus creating the need for their proof by way of their being reduced by conversion rules to syllogisms in the first figure.

Aristotle describes syllogisms in the second and third figures in the following ways. In figure 2 the middle term is predicated of both subjects in the premisses and is 'placed outside the extreme terms and is first in position' (Aristotle 1996: APr

26b39–41). Aristotle schematises this inference in terms of the sequence MNO. As M is the middle term (is first in position) and is predicated of the major and minor terms in the premises, this sequence can be seen to represent the sequence:

$$\begin{array}{l} MxN \\ MxO \\ \therefore NxO \end{array}$$

where 'x' stands for one of the four syllogistic relations, traditionally designated by the letters 'a', 'e', 'i' and 'o', 'a' designating universal affirmation, 'e' universal negation, 'i' particular affirmation, and 'o' particular negation.⁵ Aristotle then says of Figure 3 that the major and minor terms are predicated of the middle term, which is 'last in position' (Aristotle 1996: AP_R 28a14–15) and he schematises this figure as the sequence PRS. From the description we can readily see that it is meant to represent the inference:

$$\begin{array}{l} PxS \\ RxS \\ \therefore PxR. \end{array}$$

We might note one apparent shortcoming in Aristotle's schematisation of the imperfect figures, the fact that the term considered the 'middle' one of the three terms when they are considered in regard to their *extensions* is no longer 'syntactically' in the middle.⁷ Another is brought out by Peirce's example of Boroco and Bocardo. Strictly, 'particularity' in Aristotle's account of judgments refers to a *mode* of judging: a judgment is made *universally* when something is said (or denied) of all of its subject, and *particularly* or non-universally, when said (or denied) of *part* of its subject.⁸ But this distinction cuts across Aristotle's distinction between singular and universal judgments which reflects an *ontological* distinction between individual primary substances and the species or kinds (secondary substances) to which they belong.⁹ Peirce's example, like that well known example that attests to Socrates' mortality, relies on fitting *singular* statements into syllogisms, but as both Lukasiewicz (1951: 6–7) and Patzig (1968: 8) point out, within Aristotle's syllogistic there is no real place for singular judgments.¹⁰ And yet Peirce's use of singular statements here clearly has a point: not only does Aristotle himself use singular statements in syllogisms, but crucially, if such syllogisms were to be in some way 'inverted' into some inductive equivalents allowing them to be relevant to empirical inquiry and related to induction – both of which are intended by Aristotle – then it is difficult to see how singular judgment could be avoided. Both the issue of the nature of the 'middle term' and that of the relation between singularity and particularity in fact become thematic in Hegel's treatment of the syllogism.

4. Hegel's Rendering of Aristotle's Formalism

Hegel's conception of the 'concrete' universal allowed him to talk, like Peirce after him, of the logical or syllogistic structure of things and events – the term

'syllogism' or '*Schluss*' thus refers to much more than what are commonly thought of as 'inferences'.¹¹ Nevertheless, we do find in Hegel's logic, amid much else, an account of these merely 'subjective' syllogisms, and here I will restrict my consideration to this commonly neglected aspect of Hegel's overall approach.

The first thing to notice about Hegel's way of representing the structure of the syllogism is that, while employing Aristotle's sequence of three terms, Hegel replaces Aristotle's *three* sets of schematic letters for the three syllogistic figures with one, consisting of the terms 'U', 'P' and 'S', standing for 'universal', 'particular' and 'singular'. The sequence 'UPS' is used to designate the first figure, and then the second and third figures are generated by reordering these letters (Hegel 1969: 667–79).¹² With this, Hegel explicitly exploits the distinction between 'particularity' and 'singularity', a distinction that is, as we have seen, implicit in Aristotle but obscured in modern English usage in which the terms have become more or less synonymous.¹³ As with many aspects of Hegel's logic, understanding what is going on here requires a reference to Kant.

In Kant's *Critique of Pure Reason*, Aristotle's ontologically based difference between singularity and universality has become a primarily *representational* one: singular intuitions being distinguished from general concepts as different species of the genus 'representation' (*Vorstellung*) (Kant 1998: A320/B376–7). In Kant's approach, an empirical concept can never be applied to the world immediately, but only to that which is presented as the content of some other representation: either another *concept* or, ultimately, an empirical intuition. Thus in the judgment, 'grass is green', we are to think of the concept 'green', by virtue of its predication to the subject concept 'grass', as subsuming whatever *intuitive* content is subsumed under the concept 'grass'. This means that the predicate concept is applied to 'phenomena', appearances made conceptually determinate by a concept (the subject concept), rather than to some independently conceived object, grass 'in itself'.¹⁴ But this in turn gives the judgment a form analogous to that of an Aristotelian *syllogism*. For example, Aristotle says that 'When you predicate this or that of another thing as of a subject, the predicate of the predicate will also hold good of the subject' (Aristotle 1996: *Cats*, 1b9–13). Analogously, Kant might say, 'whenever a concept is applied to the content of an intuition, all further concepts predicated of that concept will thereby be applied to that intuition as well'. Thus, as Béatrice Longuenesse has pointed out, Kant's own account of judgment appears to give it an implicitly inferential structure (Longuenesse 1998: 90–92).

But in Kant's account, while the structure of the judgment is analogous to the structure of a syllogism, his intuition-concept dichotomy prevents this from being *more than* an analogy. The post-Kantian idealists, however, in abandoning Kant's dichotomy between intuitions and concepts, opened the way for regarding judgments as having an inferential structure in a much stronger sense. We might thus see Fichte as having created this possibility with his transformation of the Kantian intuition-concept distinction: while Kant had famously written 'thoughts without content are empty, intuitions without concepts are

blind', Fichte wrote, 'intuition *sees*, but is *empty*; feeling [*Gefühl*] relates to *reality*, but is *blind*' (Fichte 1982: 278). As Fichte's intuitions here 'see', we must presumably think of them as intuitions to which concepts, somehow, have already been applied – the sorts of conceptualised intuitions that appear as the subject terms of Kantian experiential judgments and to which some new concept is predicated in judgment.¹⁵

Fichte's picture suggests that these conceptualised-intuitions are not to be further factored into any component elements – are not to be analysed into some arrangement of *Kantian* intuitions and concepts. And this in turn seems somehow bound up with the fact that the *content* of these conceptualised-intuitions consists of subject relative 'feelings' in contrast to the 'sensations' Kant posits as the 'matter' of Kantian intuitions, Fichte's 'feelings' providing those radically *singular* elements that Kant had tried to capture with the idea of an intuition.¹⁶ While Hegel was critical of this treatment of feeling, it was, I will argue below, Fichte's transformations of Kant that effectively allowed Hegel to relinquish the attempt to find representations *other than concepts* to do justice to such 'singularity'. Rather than conceive of some form of non-conceptual representation of singulars, Hegel regards concepts as functioning in different contexts equally as 'singular' (analogous to Kant's intuitions and Fichte's feeling), as 'particular' (analogous to Kant's determinate subject concepts and Fichte's intuitions) and as 'universal' (analogous to predicate concepts) representations.¹⁷ In this way, empirical judgments conceived in a 'Fichtean' way become for Hegel 'expandable' into explicit inferences, the syllogism thus giving the true structure of – being 'the truth of' – the judgment.

This distinction between particularity and singularity is crucial to Hegel's reconstruction of the syllogistic figures. As we have seen, in Aristotle's second figure, the 'middle term' qua term restricted to the premises, has been predicated of both subject terms in those premises and has thus been represented 'positionally' as the 'first' rather than the 'middle' term. Note that, considered in terms of Hegel's quasi-Kantian distinctions, the only term which could be predicated of both subject terms is 'U'.¹⁸ Hegel conveys this by representing this syllogism by the sequence of terms in which U is the *positional* middle (1969: 677–9). That is, he adopts the convention of maintaining the 'middle term' in the middle of the sequence, and designating the change from the first figure by a change in which of the original terms comes to play the role of 'middle term' (that is, 'U' rather than 'P'). To complicate matters, Hegel actually reverses the order of second and third figures, calling Aristotle's second figure the third, and Aristotle's third, the second, but nothing significant hangs on this change. With all this in mind, it is clear that in Hegel's system, Aristotle's second figure (i.e., Hegel's third), designated 'PUS', is meant to be read:

UxP
 UxS
 ∴ PxS.

If we compare Hegel's third figure to the pattern of the first, (UxP & PxS, ∴ UxS) from whence it has been generated, we will see that this is inference to the minor premise or the 'case'.

Aristotle's third figure falls out similarly. Remember that in Aristotle's third figure (Hegel's second), both major and minor terms are predicated of the *middle term*. Now in Hegel's quasi-Kantian terminology, the only term of which *both* other terms could be predicated is S. Thus in Hegel's treatment of the Aristotelian third figure (his second), S has become the 'middle term'. Hegel thus symbolises his second figure as USP (1969: 674–7). As S is the term restricted to the premisses we are meant to read this as:

UxS
PxS
∴ UxP.

UxP, it will be remembered, is the major premise, the 'rule' of the first figure syllogism. Hence this is an 'inference to the rule'. But not only does Hegel's way of schematising the syllogistic structure mean that the two imperfect figures map onto the two non-deductive inference forms, Hegel actually makes this mapping explicit in his treatment of the three material 'syllogisms of reflection', designating the deductive 'inference of allness' with the structure UPS, induction with USP, and inference by analogy with PUS (1969: 688–95). Thus apart from their differences over the exact nature of the non-inductive form of synthetic inference, the parallel between Hegel and Peirce here is perfect.

Aristotelian figure	Hegelian inference type	Peircean inference type
Figure 1	Deduction	Deduction
Figure 2	Inference by analogy	Abduction
Figure 3	Induction	Induction

From his various accounts of his 'discovery' of the third inference form, Peirce seems unaware that Hegel had already anticipated his own treatment. Furthermore, given Peirce's dismissive attitude to Hegel's competence as a logical thinker, Hegel seems an unlikely source for Peirce's logical ideas.¹⁹ What then explains the convergence? A clue is given, I believe, by Peirce's association of abduction with aesthetic judgment. In a lecture from 1903, he describes hypothetical or abductive inference as 'shading into' a form of perceptual judgment, or alternatively, describes perceptual judgments as 'extreme cases of' abductive inference (Peirce 1997: 242). Perceptual judgments, it would seem, have an implicitly inferential – specifically *abductive* – structure.²⁰ Moreover, the perceptual judgments that he has in mind as so 'shading into' abductive inferences seem to be aesthetic ones. Thus in the 1878 paper he claims that every

hypothetic (abductive) inference involves the formation of a certain kind of emotion, effectively, the sort of unifying feeling we think of as characteristic of aesthetic experience.²¹ He appeals, for example, to the unification of different sounds in the experience of music: 'the various sounds made by the instruments of an orchestra strike upon the ear, and the result is a peculiar musical emotion, quite distinct from the sounds themselves' and this emotion 'is essentially the same thing as an hypothetic inference, and every hypothetic inference involves the formation of such an emotion' (Peirce 1992a: 199). In the 1903 lectures Peirce continued with his earlier characterisation of aesthetic experience as fundamentally about the perception of unity within diversity,²² and indeed, attributes to *aesthetic* experience a type of primordial normativity that he thinks is presupposed by the normativity of both ethics and logic.²³

Again, a link between the non-inductive synthetic inference form and the judgment form that Kant had assigned to aesthetic judgment, is clearly present in Hegel. But noting this only adds to the mystery: why should the parallel between Peirce and Hegel extend in that direction? My suggestion is that both Peirce and Hegel look to *aesthetic* judgment as a normative model for perceptual judgment in general and that this is part of a response to the *need* for a new model for perceptual judgment which arises as a consequence of their similar transformations of Kant's transcendental logic.

5. Inferentialism and the Problem of Perceptual Judgment

Robert Brandom has characterised Hegel as the progenitor of his own post-Sellarsian 'inferentialist' approach to semantic content (Brandom 1994: 92). Inferentialism, according to Brandom, is an alternative to the traditional 'representationalist' approach that has accepted the notion of the mental or linguistic representation of the external world as basic in accounting for human cognition – an approach, he thinks, that succumbs to Sellars's critique of the 'myth of the given'. Rather than think of inferences as relating representations whose capacity to represent is somehow presupposed, inferentialists make the inferential integration of representations primitive: the capacity to be inserted into inferential relations is invoked as an essential part of the explanation of *how representations come to have a representational content*, that is, how they come to be representations in the first place.

For Brandom, while it was Kant who first advocated an inferentialist approach to human cognition, it was Hegel who completed this move by freeing it from a residually representationalist element in his account of judgment – the doctrine of intuitions as singular representations, Kant's own version of the 'myth of the given' (1994: 92). In light of the account of Peirce's development given by Murray Murphey (1961), such a picture of completer of Kant's incomplete inferentialism would seem to be equally applied to Peirce as well.²⁴ But if we follow Hegel, Peirce and Brandom on this issue, and conceive of judgments as acquiring their cognitive content in this way, what are we to say of those judgments that have

traditionally been regarded as 'non-inferential' – perceptual judgments? The similar views of both Peirce and Hegel on the third inference form and its relation to aesthetic judgment should, I believe, be seen as motivated by the attempt to answer just this question.

Both Hegel and Peirce regard inferential structures as implicit within perceptual judgments. Just as Peirce describes abductive inference as 'shading into' aestheticised perceptual judgments, Hegel, in the *Science of Logic* (1969: 659–63) traces the development of an abductive inference form from a similarly aestheticised type of value judgment. Thus Hegel considers the explicitly evaluative 'assertoric judgment' in which universals such as 'good', 'bad', 'true', 'beautiful', and so on, are predicated of some individual thing – his example is 'this house is good'. The universals predicated of the subjects in such judgments are essentially what Kant treats as 'ideas', characterising not simply how the thing *is* but also how it *ought* to be, and while more general than judgments of beauty, such judgments for Hegel clearly refer back to Kant's aesthetic judgments.²⁵

Hegel portrays the initial manifestations of such value judgments as based on some immediately *felt* assurance of their rightness. Such bare assertions however can be met by their contraries offered in judgments by others who feel *their* evaluations to be equally justified (1969: 660), and it is against the background of such dialectical contestations that such 'problematic' judgments develop into complex *apodictic* judgments such as 'the house constituted thus and so is good', or, as Hegel spells out the structure in the *Encyclopaedia Logic*, 'this—the immediate singularity (*Einzelheit*)—house—the genus—being constituted thus and so—particularity—is good or bad' (Hegel 1991: §179). Such an *apodictic* judgment whose mediating third term gives its justifying *grounds*, making explicit *why* the house is good, is essentially a syllogism, the parts of which can be set out as follows:²⁶

Rule: Good (or bad) can be said of houses constituted thus and so.

Case: Constituted thus and so can be said of this house.

Result: Good (or bad) can be said of this house.

Set out like this, the inference shows the justification for the initial judgment of the house, but regarded as a process for giving the justification of the 'result', the inference involved is effectively an *abduction*, inferring to a new element, the 'case' stating the initial judgment's justifying grounds: the house is good *because* it is constituted thus and so. Hegel's example, I believe, now enables us to clarify two issues, the significance of Fichte's claim about 'feeling' as the content of conceptualised intuitions, and the role of 'rules' in such value judgments, and both issues suggest ways in which Hegel's treatment of the third inference form might have advantages over Peirce's.

First, while Peirce is limited to talk of judgments 'shading into' inferences, Hegel's account is more explicit. Consider Hegel's immediate judgment 'this house is good'. The 'content' of the subject term 'this house' presumably should be understood as in some way presenting the house to the judging subject with

some kind of positive affective valency – the *feeling* that is taken as warranting the predication of ‘is good’. We thus have a type of Fichtean variant of Kant’s conception of judgment. Some *singular* affectively charged content is given in experience and somehow to this content are applied the concepts ‘house’ and ‘good’. But Hegel thinks that this entire structure can be raised to the explicitly conceptual level. It is as if the *feeling* with which we are acquainted in the initial judgment is a quasi-natural presentation of the *normativity* that has its proper expression in a concept or rule: what is a singular term in the initial judgment condensing reference to an object with a ‘felt’ evaluative dimension, ‘this house’, becomes effectively an articulated judgment, ‘this house is constructed thus and so’.²⁷ Thus Hegel does *not* regard the ‘feeling’ as ‘given’ in the sense that it was so understood by some of his romantic contemporaries for whom ‘natural’ reactions could be normative; for Hegel it is more a type of pre-sentiment of the normativity properly expressed conceptually, and it is significant *only* because it can be developed into conceptual and hence communicative form.²⁸ And yet, of course, the role of feeling in such immediate judgments is far from irrelevant, as the attempt to *justify* one’s judgments by appealing to its conceptualised ground is just the attempt to give a conceptual form to that very normativity that one had initially ‘felt’. Thus the concept always retains a dimension of ‘singularity’, that dimension abstracted from the cognitive process and hypostatised into something non-conceptual in both Kant and Fichte.

Next, in Peirce’s 1878 paper it is not clear how the two approaches he there adopts to hypothesis/abduction are related. Conceived ‘syllogistically’ it is inference from ‘result’ and ‘rule’ to ‘case’ while conceived as non-demonstrative ampliative inference it is inference from observed fact (result) to its hypothesised cause. Furthermore, in the later case it is unclear as to how we are meant to understand a ‘rule’ as being involved *prior* to the inference being made.²⁹ Hegel’s focus on aestheticised value judgments, and his Kantian conception of the third inference form as inference by *analogy*, suggest, I believe, an answer here.

In the *Critique of Judgment* Kant had stated that in the case of reflective aesthetic judgments there were no given rules for the application of the evaluative concept ‘beautiful’ (Kant 1987: §8, p. 59), and this seems to agree with the experience of aesthetic judging itself. Nevertheless, abduction *needs* a rule, and here the way that both Kant and Hegel conceive of the third inference form as inference from analogy seems pertinent. We might say that while aesthetic judgments have no ‘rules’ in the sense of generalisations of the sort, ‘all things with such and such properties are beautiful’, they might nevertheless be thought to presuppose *exemplars* of aesthetic quality, a role played by classic or canonical works in aesthetic culture, for example.³⁰ Thus, appeal to undisputed exemplifications of aesthetic qualities seems central to aesthetic reasoning: typically one attempts to get the other to see how the object or work in dispute actually instantiates some qualities that are already appreciated elsewhere. Indeed, this analysis seems to fit in with Hegel’s description of the universal ‘middle term’ of the ‘syllogism of analogy’ as an ‘essential universality’ within which ‘singularity and universality are immediately united’ rather than abstractly opposed (Hegel 1969: 693–4). Here

it might be supposed that he has in mind a normative exemplar which serves as a vehicle for the analogy – some *singular* object that because it is taken as instantiating a rule or standard is effectively functioning *as a universal*.

6. Concluding Remarks

I have suggested that the convergence over Hegel's and Peirce's respective accounts of a third inference type is at least partially driven by the need to find an alternative account of the nature of perceptual judgment in the light of their inferentialist developments of Kant's transcendental logic. Many further questions would, of course, need to be answered in order to evaluate the success of this move. Perhaps most pressingly, it would have to be shown how the model sketched here on the basis of a type of *aestheticised* value judgment could be applied to perceptual judgments more standardly conceived, that is, perceptual judgments without an 'in-built' evaluative dimension – especially the judgments of science. While pursuing such questions is beyond the scope of this paper, I will conclude with some suggestions concerning the ways in which this analysis might be thought to point beyond the realm of explicitly evaluative judgments.

From Hegel's (and perhaps Peirce's) point of view, there is a *sense* in which aesthetic judgments are more *paradigmatically* judgments than the sorts of perceptual judgments ('the vase is blue', 'the cat is on the mat' and so on) that are often so regarded in the representationalist tradition. In that tradition, it is the likelihood of *disagreement* over aesthetic and other evaluative judgments, in contrast to the likelihood of agreement over such simple perceptual judgments, that contributes to suspicion about their 'objectivity' or 'truth-aptness'. For Hegel, however, the situation is reversed: it is *contestability* and *disagreement* that forces judges to search and find *reasons* for their judgments, and so it is this process which establishes the very possibility of objectivity. In the *Science of Logic* Hegel goes so far as to deny that the sorts of judgments that are often taken to be paradigmatic *are in fact* judgments at all.³¹

Of course from the perspective of the *representationalist* tradition, giving paradigmatic status to such evaluative judgments looks perverse: as judgments are thought of as representing worldly facts, the Hegelian position is seen as populating the world with strange features to which the evaluative elements of those judgments must somehow correspond. But because the Hegelian inferentialist eschews the notion that the judgment gets its meaning representationally, she is not faced by this difficulty. Rather, for the inferentialist the paradigmatic status of evaluative judgments highlights the essentially normative nature of *all* concepts. Positive and negative affects are immediately experienced as normative, and so evaluative concepts, such as 'beautiful' and 'ugly', whose applications typically involve such affects, wear their normativity, as it were, *on their sleeves*. But as Hegel makes clear in his resistance to his romantic contemporaries, feeling (and so, in some general sense, *nature*) is not the *ground* of their normativity. The ground of their normativity resides in their very

conceptuality – the fact that they are applied and communicated in judgments governed by normative criteria that allow such applications to be challenged, criticised, defended. Finally, perhaps this points to the most fundamental way in which Hegel's position is 'idealist', as for him it is the *normativity* that attaches to feeling, considered as an otherwise natural phenomenon, that must be regarded as an immediate form of the normativity that properly belongs to concepts.³²

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NOTES

¹ Thus, in a lecture in 1903 he comments: 'These three kinds of reasoning are Abduction, Induction, and Deduction. Deduction is the only necessary reasoning. It is the reasoning of mathematics. It starts from a hypothesis, the truth or falsity of which has nothing to do with the reasoning; and of course its conclusions are equally ideal. . . . Induction is the experimental testing of a theory. . . . It sets out with a theory and it measures the degree of concordance of that theory with fact. It never can originate any idea whatever. No more can deduction. All the ideas of science come to it by the way of Abduction. Abduction consists in studying facts and devising a theory to explain them. Its only justification is that if we are ever to understand things at all, it must be in that way' (Peirce 1997: 217–8).

² Kant is insistent that such inferences 'are not functions of the *determinative* power of judgment . . . but rather of the *reflective*; hence they also do not determine the *object*, but only the *mode of reflection* concerning it, in order to attain its cognition' (Kant 1992: 625–6). In the *Dohna-Wundlacken Logic* he further notes that: 'According to the inference by analogy, if 2 things agree under as many [determinations] as I have become acquainted with, then I infer that they agree also [in] the other [determinations]. I infer, then, from some determinations, which I cognize, that the others belong to the thing too. This is an inference of a provisional judgment. One reserves the right to change it' (Kant 1992: 503).

³ An idea apparently first advanced in Shorey 1924.

⁴ 'I call a syllogism perfect if it requires nothing apart from what is manifested in it to make the necessary conclusion apparent, imperfect if it requires one or more propositions which, although they necessarily follow from the terms which have been laid down, are not comprised in the premisses' (Aristotle 1996: APr 24b23–27). Peirce says that 'if one sign denotes generally everything denoted by a second, and this second denotes generally everything denoted by a third, then the first denotes generally everything denoted by the third, is not doubted by anybody who distinctly apprehends the meaning of these words' (Peirce 1992a: 57). The rule of inference involved here is traditionally known as '*nota notae*': an attribute of an attribute is an attribute of the thing.

⁵ cf Peirce's Baroco:

MaN	Mortal can be said of all men.
MoO	Mortal cannot be said of Enoch and Elijah.
∴ NoO	∴ Man cannot be said of Enoch and Elijah.

⁶ cf Peirce's Bocardo:

PoS	Mortal cannot be said of Enoch and Elijah.
RaS	Man can be said of Enoch and Elijah.
∴ PoR	∴ Mortal cannot be said of all men.

⁷ This problem of the disparity between what we might call the semantic and syntactic senses of 'middle' had been raised by the later Peripatetics (Lukasiewicz 1951: 31). This issue is discussed in an illuminating way by Byrne (1997: 48–50) who shows how Aristotle's conversion rules re-establish the appropriate coincidence of semantic and syntactic middles by reducing these syllogisms to the first figure.

⁸ A statement 'may be universal or particular By universal I mean a statement which applies to all, or to none of the subject; by particular a statement which applies to some of the subject, or does not apply to some, or does not apply to all' (1996: APr I, xxiv, a18–21).

⁹ This allows Aristotle to speak of judging *non-universally* of *universals*, as in the judgment 'man is white', a judgment whose meaning differs from 'all men are white', 'some men are white' or 'a man is white'. On this see Whitaker 1996: ch 7.

¹⁰ Lukasiewicz excludes singular terms from the syllogism because he believes that subject terms must also play the role of predicates, and singular terms cannot do this (Lukasiewicz 1951: 6–7). This can be seen in Barbara, where the middle term must play the role of subject of one premise and predicate in the other. The traditional scholastic view (repeated in Kant) was to treat singular judgments as logically the same as universal judgments because their subject terms are distributed.

¹¹ Hegel famously claims in the *Encyclopaedia Logic* that 'Alles ist ein Schluss' (Hegel 1991: §182, rem). Such a conception of the *concreteness* of the conceptual is also reflected in Peirce. As the editors of Peirce 1992b point out (32–3), Peirce had planned for his 1898 Cambridge Conferences the title, 'Eight Lectures on the Logic of Events', however, under pressure from William James to exclude technical material and make them more accessible to a lay audience, he came to exclude much of the material that could justify that title. The lectures were finally advertised as 'Reasoning and the Logic of Things'.

¹² In order to contrast Hegel and Aristotle here, I will maintain the Aristotelian 'predicate-first' way of representing judgments and syllogisms, rather than use the somewhat less perspicuous reverse SPU order Hegel himself adopts. I have also rendered Hegel's '*Einzelne*' as 'singular' rather than 'individual' and hence rendered it by the symbol 'S' rather than 'I' as in the Miller translation. On this point see the translators' introduction to Hegel 1991.

¹³ On the history of this confusion, see Whitaker 1996: 89.

¹⁴ Thus the subject concept 'grass' is to be conceived as applied to an indeterminate sensory 'something' (*etwas*), an indeterminate content that Kant sometimes designates by 'x', a content presented within the spatial and temporal forms of intuition.

¹⁵ Wilfrid Sellars effectively interprets Kant's 'intuition' in this way as a 'this such'. See Sellars 1992: 5–8.

¹⁶ Fichte thinks of the 'sensations' of colour or taste, for example, as non-representational states of the self, 'feelings'. To have a feeling as such is to be in an empirical but not an epistemic state: 'Anything sweet or sour, or red or yellow, is absolutely incapable of being described, and can only be felt, nor can it be communicated by any description to someone else. . . . All that can be said is that *the sensation of bitter, sweet, etc., is in me, and nothing more*' (Fichte 1982: 274–5). But while not themselves representational or epistemic, such states are necessary for the process of representing. They are the occasions of conceptual positing.

¹⁷ For Hegel, Kant's separation of concepts and intuitions as general and singular representations respectively reflects his elevation of the 'mere understanding' over 'reason', the faculty of inferential reasoning. Thus: 'Only *mere representational thinking*, for which abstraction has isolated them, is capable of holding the universal, particular and singular rigidly apart; in this way they can be counted, and for a further distinction such thinking holds to the *completely external* one of *being*, namely, *quantity*, which is nowhere less appropriate than here' (Hegel 1969: 620).

¹⁸ 'The subject can therefore, in the first instance, be taken in relation to the predicate as the singular over against the universal, or even as the particular over against the universal, or as the singular over against the particular' (Hegel 1969: 623–4).

¹⁹ In terms of personal influence it would seem that the work of William Whewell is relevant in at least the early formation of Peirce's ideas about abduction. See Fisch 1991: 109–10. Peirce discusses Whewell's approach to induction in a lecture in 1865 (Peirce 1982: 205–38), the year before the Lowell Lectures in which he first introduced the idea of hypothetical inference (1982: 362). Whewell, however, was clearly influenced in his account of science by Kant (as Peirce himself points out (1984: 205–9)), and possibly also, Hegel. Thus Michael Ruse raises the question of the possible influence of Hegel in 'William Whewell: Omniscientist' and John Wetterstein and Joseph Agassi refer to Whewell's 'quasi-crypto-Hegelianism' in 'Whewell's Problematic Heritage', both in Fisch and Schaffer 1991. The relevance of Whewell to Peirce was pointed out to me by Barak Atzmon.

²⁰ For Peirce, what separates abductive inference from perceptual judgment, it seems, is that while inferences are conceived normatively, there is a sense in which a perceptual judgment is involuntary and so, not regulated by norms. Thus Peirce contends that we 'cannot form the least conception of what it would be to deny the perceptual judgment' (Peirce 1997: 244). A perceptual judgment is one which is 'absolutely forced upon my acceptance', and so uncontrollable and uncriticisable.

²¹ 'Hypothesis substitutes, for a complicated tangle of predicates attached to one subject, a single conception. Now, there is a peculiar sensation belonging to the act of thinking that each of these predicates inheres in the subject. In hypothetic inference this complicated feeling so produced is replaced by a single feeling of greater intensity, that belonging to the act of thinking the hypothetic conclusion. Now, when our nervous system is excited in a complicated way, there being a relation between the elements of the excitation, the result is a single harmonious disturbance which I call an emotion. Thus, the various sounds made by the instruments of an orchestra strike upon the ear, and the result is a peculiar musical emotion, quite distinct from the sounds themselves. This emotion is essentially the same thing as an hypothetic inference, and every hypothetic inference involves the formation of such an emotion' (Peirce 1992a: 198–9).

²² 'In the light of the doctrine of categories I should say that an object, to be esthetically good, must have a multitude of parts so related to one another as to impart a positive simple immediate quality to their totality; and whatever does this is, in so far, esthetically good, no matter what the particular quality of the total may be' (Peirce 1997: 213).

²³ The relevance of affective and aesthetic factors in cognition is for Peirce by no means limited to the domain of perceptual judgment. For a more general consideration of the cognitive role of affect for Peirce see Hookway 1997.

²⁴ In *The Development of Peirce's Philosophy* Murphey describes Peirce as having started from a broadly Kantian position and, after studying of the logic of Duns Scotus, having become convinced that 'the proper object of logic was the syllogism and that the study of the syllogism ought to precede the study of the proposition since the only differences among propositions that are logically significant are those which affect their role as components of syllogisms' (Murphey 1961: 56).

²⁵ We might think of moral judgments as conceived by earlier 'moral sense theorists' such as Shaftesbury and Hutcheson as paradigmatic of such extensions of aesthetic judgment into extra-aesthetic value domains. Both Shaftesbury and Hutcheson had been highly influential in Germany, important works of Hutcheson being translated into German in the late 1750s and early 1760s. Kant's lectures on moral philosophy around this time show him to have been very sympathetic to Shaftesbury's and Hutcheson's moral sensibillism, although he had become critical of it by the time of his transcendental philosophy (see Kuehn 2001: 131 & 202). Romantic culture, however, was receptive to such an aestheticised approach to value judgment, and Hegel, though critical of it, took the approach of his romantic contemporaries in this regard seriously.

²⁶ Hegel is critical of the idea that an immediate perceptual judgment such as 'the rose is red' has a 'content' independent of any role that it can play in reasoning (inference) – a content in virtue of its capacity to 'represent a fact', for example. In his account of the 'development' of the structure of judgment given in the *Encyclopaedia Logic* we are first meant to think of such a judgment on the model of 'reflective' ones such as 'the plant is curative' (Hegel 1991: §174). Reflective judgments are judgments whose contents are more clearly inferentially linked to other judgments such as, in this example, that such and such a sick person recovered on being fed this plant. Indeed, with his idea of abductive inferences shading into perceptual judgments, Peirce also thinks of simple perceptual predicates as quasi-theoretical terms – 'blue', for example, picking out a dispositional property which explains the object's effect on the observer's experience.

²⁷ In *Science of Logic*, Hegel refers to the process of making determinate in language something which (like feeling) is initially presented as indeterminate: 'the enunciation of what it is, itself sublates what it is supposed to be; it is enunciated as one with determinateness, and in this way, out of the abstraction is established its truth and the concept' (Hegel 1969: 609).

²⁸ Thus while the romantics' attitude was to *accept* nature as normative, for Hegel the question of the normativity of our natural reactions is just what is raised in the process of confrontation with contrary reactions: it cannot be the case that our natural responses are normative *per se*. Rather, it might be said that for Hegel the normativity of our feelings rather than being *given* resides in their being so *taken*. That it is the *taking* of our reactions to be normative that is at issue here is reflected in our *endorsement* of them, an endorsement that leads to attempts to *justify* the claims based upon them in the face of contradiction.

²⁹ Thus in a 1901 paper (1998: 107) Peirce talks of abduction as 'nothing but guessing', but it is far from clear how to think of a rule as involved in a *guess*. For a criticism of the idea that the creation involved in abduction is a type of rule governed *inferential* process

see Kapitan 1992. In this respect Hegel's account might be seen as a reply to just this type of criticism.

³⁰ The topic of the exemplary nature of good art works is broached in Kant's discussion of genius in (Kant 1987: §46).

³¹ 'For example, "Aristotle died at the age of 73, in the fourth year of the 115th Olympiad", is a mere proposition, not a judgment. It would partake of the nature of a judgment only if doubt had been thrown on one of the circumstances, the date of the death, or the age of that philosopher, and the given figures had been asserted on the strength of some reason or other' (Hegel 1969: 626). In the *Phenomenology of Spirit*, Hegel notes: 'Even an immediate intuition is held to have genuine value only when it is cognized as a fact *along with its reasons*' (Hegel 1997: §41, emphasis added).

³² I would like to thank Tim Bayne, Jean-Philippe Deranty, Kim Frost, Rachel Goodman, Simon Lumsden, David Macarthur, Peter Menzies, Robert Sinnerbrink, Justin Tauber and an anonymous reader for helpful comments on earlier versions or disembodied parts of this paper.

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